MONITORING FOR IMPACT:
LESSONS ON NATURAL RESOURCES MONITORING FROM 13 NGOS

VOLUME II: CASE STUDIES

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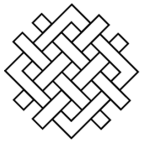

PART II: CASE STUDIES

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PREFACE

This handbook, a project of the Global Forest Watch network (GFW), is about the natural resources and forest monitoring work of 13 non-governmental organizations (NGOs). Each of the organizations provided case studies describing lessons they learned from monitoring natural resources, especially forests. We hope this handbook will provide useful tips to improve existing monitoring programs and guidance in designing new programs.

Conceived by the World Resources Institute (WRI), GFW is an independent, decentralized network of NGOs, universities, and other groups that monitor logging, mining, and other development activities within major forest regions of the world. GFW and its national affiliates provide early warning data on development pressures—information people can use to protect the forests and plan ecologically and socially sensitive development activities that result in minimal damage to forest ecosystems.

This handbook benefits both from GFW and WRI's experience in compiling global trends in environmental indicators, as well as from Conservation International and other NGO's experience with on-the-ground monitoring.

About The Title

Every NGO that contributed to this handbook has a conservation mission. They want to conserve natural forests, protect biodiversity, empower local populations, or improve natural resource management practices. They want to have an impact. The title of this handbook reflects the underlying mission of these groups.

The Audience For This Handbook

Our primary goal is help NGOs create and improve forest monitoring programs around the globe, particularly in the developing world. However, we hope that NGOs interested in natural resources, and groups such as government agencies and academics, will also find it useful.

This handbook contains basic instruction on monitoring and principles that are vital to any successful monitoring program. It presents an integrated framework for creating and implementing natural resources monitoring programs. But, the handbook also presents a way of thinking about monitoring. We hope that this conceptual and methodological framework will make current and future monitoring projects more effective and more efficient.

Many handbooks are prescriptive. We want this handbook to illuminate the issues through examples from the field. Our hope is that readers will "see themselves" among the case studies. In this way—recognizing common problems and experiences—we hope readers will find inspiration, ideas, and methods for their own work.

The Context For Ngo Monitoring

In theory, governments manage resources for the public good. Environmental NGOs promote and encourage the stewardship of natural resources. Environmental NGOs and governments are sometimes at odds, but the relationship also can be synergistic, with both sides helping to improve environmental management. NGOs can provide information and expertise to encourage or challenge governments to succeed. By seeking and acting on good information, both groups can succeed in their respective responsibilities. Effective monitoring helps to ensure that the necessary information is gathered, communicated, and used.

Technological and social trends are making NGOs increasingly important and effective in conducting monitoring and providing information to drive better stewardship of natural resources. Tools for information

collection, storage, and communication are less expensive and more widely available than ever before. Smaller organizations have a greater opportunity to affect events. And, the worldwide trend toward democratization is allowing societies to open and maintain dialogues about social issues—including environmental protection and environmental justice—that were not openly discussed before.

NGO monitoring has helped start these discussions and move them forward. If this trend continues, governments and civil society will continue to improve resource management.

Illegal Activity In Monitoring

Some of the case studies portrayed in this handbook include monitoring techniques that skirt the line between lawful and unlawful. We have not edited these examples from the case studies. However, that does not imply that we advocate or condone activities that may be illegal. Using unorthodox methods to collect data can sometimes be advantageous. Illegal activities, in our view, are neither appropriate nor advantageous.

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Our colleagues at WRI and CI have also been generous with their time and support. Our thanks to Dirk Bryant, Daniel Tunstall, Tony Janetos, Peter Veit, Jake Brunner, Sean Gordon, Conrad Reining, Joe Vieira, Christopher Rader, Claude Gascon, and Jorgen Thomsen.

FOREWORD

Monitoring for Impact is a product of the combined efforts of the World Resources Institute's (WRI) Global Forest Watch (GFW) program and Conservation International's (CI) Monitoring and Evaluation program. GFW was launched in 1997 by WRI with non-governmental organizations (NGOs) and local leaders from nations with significant forest resources. GFW links satellite imagery with on-the-ground investigation by local groups to assemble information about risks to the world's great forests. It uses the Internet to make that information widely available.

CI's Monitoring and Evaluation Program develops analytical tools and standards for monitoring of conservation impact of programs. The Program maintains a network of conservation managers in 17 countries within the world's biodiversity hotspots, and provides skills development in strategic management to CI programs and allied organizations.

Until recently, there was little systematic information about the condition of the world's forests. It was impossible to say how much forest had been lost and how much remained as frontier forest—large, intact, and fully functioning natural ecosystems. Frontier forests provide a livelihood for millions of people, help slow global warming, control flooding, purify water, and cycle nutrients and soil, ultimately influencing food production for billions of people. In 1997, WRI and its partners found that just 20 percent of the world's original frontier forests remain today. These forests continue to be degraded or lost at a rate of about 14 million hectares per year.

Local initiatives are proving to be the most effective means of reining in this continued destruction. More than a decade of work by international governmental, non-governmental and development organizations has shown that empowering citizen groups giving advice and holding governments and industry to a high standard are vital to improving forest management.

The Internet, satellite-gathered data, and telecommunication are rapidly changing the way forests are managed and protected. These innovations provide more accurate and up-to-date information about forests as well as the means to make that information available to all those with a stake in those resources. In addition, these tools are increasingly available to small and local citizens groups, presenting them with unprecedented possibilities to gather and share information. Local NGOs use this information to gain an increasingly important voice in local and global debates on how their resources are managed and to educate consumers about the products they purchase.

Having gained this voice, local NGOs now need the means to use these tools to conduct forest monitoring and communicate the results to a global audience. This handbook acts on Global Forest Watch (GFW) and Conservation International's (CI) commitment to help local NGOs attain those means.

We are deeply grateful to the United Nations Environment Programme (UNEP), the AVINA Foundation, IKEA and the Turner Foundation for their support of Global Forest Watch and to Conservation International for making this handbook possible.

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INTRODUCTION TO THE CASE STUDIES

This is the second volume of *Monitoring for Impact's* two volumes. It contains the stories of 13 NGO's monitoring programs and some lessons learned by the NGOs. The case studies are presented because many environmental organizations in the world must solve similar sets of problems. These diverse organizations can provide advice through common experience.

Volume one of Monitoring for Impact is a hands-on handbook on organizing and implementing a natural resources monitoring program. The text of Volume 1 can be found in its entirety at *http://www.globalforestwatch.org/* and *http://www.conservation.org*.

Some readers will benefit from reading all the case studies in their entirety. Conversely, the studies can be used as a source of information on only one aspect of running a monitoring program. To facilitate this approach, we have used a common outline for each case study.

ASSOCIATION FOR THE PROTECTION OF ENVIRONMENT AND CULTURE (APEC), NEPAL

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By Medini Bhandari

Introduction

The Association for the Protection of Environment and Culture (APEC) was founded in 1988 by a group of people who had been working together on environmental issues. In the years between 1985 and 1988, the informal group carried out a variety of activities. They established tree nurseries growing banyan and ficas trees, which are sacred in Hindu mythology and therefore cut less often than other trees. They collected and transplanted seedlings from inhospitable places and established a plantation from these seedlings. They started a campaign to encourage people to plant these sacred trees on important days such as the birth of a child. These efforts earned them a reputation as dedicated conservationists in the area around Biratnagar City, where they concentrated their efforts.

As these efforts became established, the fledgling group diversified its activities and began using interviews to survey local forests and the associated animal, bird, and plant species in Jhapa and Morang districts, as well as both legal and illegal encroachment into these forests. In 1987, as the membership and activity of the group continued to grow, it was decided that an official forum should be created to work regularly and systematically. APEC was therefore officially established on January 1, 1988. It is registered under Nepal law and is also a member of the World Conservation Union (IUCN), Forest Stewardship Council (FSC), and other international organizations.

Organization

Mission and Objectives

APEC's mission is to move Nepal's continuing development toward a model free of population growth and ecological degradation, ensuring a minimum standard of living on a sustainable basis.

The principal objectives to accomplishing that mission are to

- Improve knowledge of conditions and pressures on the Nepali environment;
- Reduce the negative impact of poor resource-dependent people on local environments; and

- Conserve and protect wild areas and restore degraded areas.

Staffing and Organization

APEC is a nonprofit membership-based organization as defined by Nepali law. It has about 3,000 members. The organization is led by an executive committee consisting of seven full-time staff. Seventeen part-time workers and seven technical advisors provide support to this executive committee. The rest of the organization is made up of volunteers, about 550 of whom work at least one day per week for the organization, and an 1,800 or so work at least one day per month.

Constraints and Opportunities

Legal Aspects

Since the government made the transition to a democracy in 1991, fear of intimidation—such as imprisonment on false charges or legal technicalities—is no longer a constraint to APEC's work. Other legal constraints are also negligible. In Nepal, there is no law against monitoring the condition of natural resources. Different agencies are working in this field in various capacities. However, one does need to ensure that the information gathered is accurate and does not misrepresent the actual situation. APEC addresses this issue by training its members to gather data in a rigorous and accurate manner.

Finances and Equipment

Initially, APEC's expenses were borne by the founding members. As more members joined, associated dues produced more income, and they are now the largest part of APEC's annual budget. However, membership dues are not sufficient to completely fund APEC's programs. Donor agencies such as World Conservation Union (IUCN), Worldwide Fund for Nature (WWF), United Nations Education, Scientific and Cultural Organization (UNESCO) and HMG-Nepal help to make up the deficit.

Despite the funding sources, APEC's budget is limited and a significant constraint on activities. APEC has the human resources to conduct regular monitoring and record keeping, but its ability to use other methods to gather, analyze, and disseminate data more effectively is limited by a lack of sufficient funds. APEC has members trained in remote sensing as well as in Geographic Information Systems (GIS) software, but it lacks the hardware and software necessary to access data and use it.

To raise more money, APEC is trying to increase membership and get further institutional support from concerned agencies.

Monitoring Program

Work Planning

APEC plans its activities annually, based on the ideas of its members. During each annual meeting, unit coordinators present a summary of the condition of their regions, explaining the major problems and the steps needed to reduce them. The ideas are discussed and ranked based on the following criteria:

- How does the project fit APEC's mission and objectives?
- How well can APEC handle the project? Is it affordable?
- What is the specific time frame and how does it fit with current projects?
- Will volunteers and staff have time to work on the project?
- Have similar projects succeeded?

If the project is thought to be viable, affordable, and acceptable, it is given a high priority. APEC sometimes receives requests from local residents to implement a program. We give these requests high priority because they show the residents' dedication to conservation. Often APEC's involvement in these projects is minimal and consists mostly of mediation or facilitation.

Even after the projects are chosen, implementation depends on a variety of factors. Availability of information, funds, partners, and volunteers are all important. The time of year is also significant because of seasonal considerations. In the dry season, the work consists mainly of monitoring and educational programs. In the wet season, the distribution of seedlings and other plantation work is added.

When a good project is proposed but lacks funding, APEC tries to find funds by going to donor agencies and asking local residents for help. If it is unable to get support from these sources, it reevaluates the importance of the project. If it finds it to be very important, the organization calls an emergency meeting and collects funds from members.

Monitoring Process

APEC has been involved in monitoring since 1988, mostly using primary sources but also using secondary sources when applicable. APEC has developed its own procedures and methods for collecting data.

APEC's process for monitoring consists of

- Site identification;
- Identification of data needs;
- Fieldwork preparation (such as location of study areas on maps and photos);
- Conducting fieldwork to ascertain conditions and people's perceptions of them;
- Data compilation and processing; and
- Conclusions and recommendations.

Data-Gathering Tools

Field Surveys. Field surveys provide APEC with most of its primary biological data.

Rapid Rural Appraisal/Participatory Rural Appraisal. Perception data are gathered using Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal methods as well as question-and-answer sessions. APEC tries to foster an open atmosphere for the interviews in which people feel free to express any ideas or viewpoints. Both questionnaires and interviews are used so answers can be cross-checked.

Interviews. Interviews are conducted to gather information that can help guide subsequent field surveys. They provide a baseline level of data and are also important for planning purposes.

Secondary Sources. Secondary sources are also used to inform APEC, especially about larger areas where it is difficult for the organization to gather its own information. Topographic, climatic, soil, and vegetation data are obtained in this manner. Maps made by the survey, soil, and forest departments are examples of data providers. Other secondary sources include scientific journals, research by other NGOs, dissertations by university students, and newsletters.

RRA Approach for interviews

RRA is a relatively new approach to conducting action-oriented research in developing countries. It consists of a set of tools and techniques for acquiring information on many aspects of rural life, including energy needs, use, supply, and problems. The principles of RRA are to

- Optimize trade-offs between performance and cost, and speed and cost, as well as the amount and detail of data;
- Avoid biases;
- Appreciate the value and legitimacy of indigenous knowledge of local people;
- Listen and learn directly from local experts, which include the inarticulate in rural society;
- Use triangulation (different methods, disciplines, and informants to approach the same problem); and
- Rely on serendipity—listen and look for new knowledge.

The central philosophy of RRA is the pursuit of "optimal ignorance" and diversity of analysis through the process of triangulation.

The techniques used in RRA will depend to a large extent on the type of information required and the objectives of the study. Various techniques can be used to acquire data. The most common techniques are direct observation, semistructured interviews, secondary data review, analytical exercises, diagrams, and workshops.

Data Quality Control

For numerous legal and ethical reasons, APEC feels strongly that the data it gathers and publishes must be accurate and transparent. APEC therefore plans its data collection, calculation, and analysis methods carefully and employs a variety of methods to reduce errors resulting from preconceptions and biases of the researchers. These include taking baseline surveys, conducting random sampling, conducting RRA and Participatory Rural Appraisal methods, and using remote sensing and GIS to reduce error and help corroborate field-collected data. APEC uses the book by J.H. McGarth, *Research Methods and Designs for Education*, as a basis for its data collection methodology.

Examples Of Monitoring Projects

Objective. Improve knowledge of conditions and pressures on the Nepali environment.

Strategy. Monitor, analyze, and disseminate information on the Nepali environment and on the knowledge of indigenous people.

Program. Monitor, analyze, and publish information on the condition of forests, wetlands, wildlife, aquatic ecosystems, economic conditions in rural areas, and indigenous environmental knowledge.

Examples of projects.

- Regular natural forestry monitoring program started in 1987.
- Monitor wetland animal species in Koshi Tappu and other wetland areas.
- A study of wildlife and forest areas in eastern Tarai.

Strategy. Establish forums to facilitate the exchange of ideas and information.

Program. Bring scholars, social workers, and representatives of various rural communities together to work with APEC on developing strategies for conservation and development.

Examples of projects. Evaluate and endorse articles, books, and other publications on the conservation of natural resources.

Objective. Reduce the negative impact of people on their local environments.

Strategy. Increase awareness of the impacts of resource degradation and of ways that people can reduce these impacts.

Program. Hold seminars for local people in rural areas about conservation and preservation.

Examples of projects.

- Meetings, talks, and other programs to educate people about the benefits of local wetlands and resident animal and plant species.
- Education programs for illiterate groups in eastern Nepal.
- Wildlife, forest, and wetland conservation education programs at secondary schools and university campuses.
- Programs oriented toward women's concerns in conservation.
- Video, audio, drama, song, dance, and other forms of expression that can spread APEC's message.
- Eco-clubs in schools across Nepal, including a club newsletter.

Objective. Directly conserve and protect wild areas and restore marginalized areas.

Strategy. Create alternative sources of wood and other forest products.

Examples of projects.

- Establish plantations to help create greenbelts and preserve biodiversity in natural forests.
- Establish and operate three large nurseries.

Objective. Enhance the ability of organizations working within Nepal to improve the environment.

Strategy. Work with other institutions, providing them information and advice.

Program. Advise government agencies and local bodies about conservation and development.

Examples of projects.

- Report results of monitoring programs to HMG-Nepal and other government agencies.
- Consult with and provide information to international NGOs.

Program. Participate in interagency conservation undertakings, research, and seminars directed toward conservation and development.

Examples of projects. Organize educational programs with WWF Nepal.

Communication

APEC employs many methods of communicating its data to audiences. These include traditional reports and newsletters. APEC also exerts a lot of energy communicating directly with villagers, schoolchildren, and other groups that are not reached by the more formal communication strategies.

Reports

APEC compiles an annual monitoring report for the central committee. This report is discussed and then released to the media. Results of APEC's individual studies are published in reports or in APEC's local and national newsletters.

Direct Communication

APEC will share its information in an unpublished format with both national and local authorities when it is appropriate. Unpublished information is also shared with national and international NGOs and donor agencies.

APEC makes strong efforts to communicate back to villagers the knowledge it gains from local residents. This gives villagers the ability to make informed decisions and maintain an interest in sharing their knowledge. Discussion programs, seminars, visual exhibitions, and local and national newsletters are all common strategies for sharing information.

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Introduction

The Center for Environment and Development (CED) was established in 1994 in response to the lack of dialogue, monitoring, and advocacy on environmental management issues in Cameroon. CED hopes to provide needed information and engender the public discourse necessary for an accountable society.

For a long period in Cameroon's modern history, discourse and dissent were not tolerated. For the three decades before 1990, free speech was subdued by a law to repress "subversion." Punishment could be up to 20 years imprisonment in special camps. The law did not specify the activities that constituted subversion, and judges therefore had much discretion.

The activities that CED carries out as part of its monitoring and advocacy program would have previously fallen into the subversive category. Now, however, the current political context is less hostile to open expression. Many countries in western Africa have undergone liberalization and allow expression of opinions that run contrary to government positions.

But this does not mean that the political and social climate is conducive to CED's activities. Corporations, politicians, local communities, and NGOs in Cameroon are not yet used to advocacy activities. When their actions and policies are challenged and publicized, they have a strong tendency to become defensive and personalize the debate. Criticizing an institution's activities as threatening to the environment is still often perceived as attacking the institution's leader.

Another difficulty is the lack of a monitoring and advocacy tradition in Cameroon. There is no experience on which to build. CED is currently working to develop effective monitoring and advocacy practices that are designed to work in the nation's political and social climate. Although much work remains to be done, we are making progress

Organization

Mission and Objectives

CED's principal objectives are to monitor the environmental and social impact of actions by corporations and government agencies in Cameroon and to publicize the negative impact these practices are having on the environment, local people, and the entire nation.

CED is attempting to stimulate a public debate on these issues. It supports grassroots communities, helping them to become more involved in the management of forest resources.

The objectives and mission of CED came into existence after a two-year process. Many associations were established as soon as the 1990 law on the freedom of association in Cameroon was enacted. Thanks to the Rio Summit, many of them expressed an interest in the environment. However, very few were concerned with forest management.

The process of revising forestry law and policy, carried out with the help of the World Bank within the framework of a structural adjustment program, offered a unique opportunity for emerging Cameroonian environmental NGOs to express their opinions on this sensitive

topic. Unfortunately, many NGOs, notably the young Federation of Environmental NGOs in Cameroon, did not get involved in the debate.

A few members of this network decided to make an assessment of the forestry sector in Cameroon to identify problems and areas of action. Two major areas emerged. First, CED had to work at the local level with the support of the population living in the forest zone, paying particular attention to the indigenous population. Second, CED had to work at the national and international levels, where decisions are made that have a direct impact on the situation at the local level.

The Monitoring Program

CED's monitoring and advocacy campaign consists of eight steps:

1. Decide what issues to monitor.
2. Determine the desired outcomes of the monitoring campaign.
3. Analyze the problem, the parties involved, and how they operate.
4. Choose targets and allies.
5. Choose methods of action and how to implement them.
6. Gather the data.
7. Analyze the data and write the reports.
8. Communicate the results of the campaign and press for better environmental and social policy and management.

Example Of A Monitoring Project

Stopping a Sawmill

In 1997, the Hazim-Boitex lumber company, which holds a logging permit in the Lomie area, decided to build a sawmill on the edge of the Dja Reserve. (At 500,000 hectares, the Dja Reserve is the largest protected area in Cameroon. The United Nations Educational, Scientific, and Cultural Organization (UNESCO) has classified it as a world heritage forest.) The company's goal was to promote the local processing of rough timber from Cameroonian forests. However, the decision was highly problematic because of sawmill's proximity to the Dja Reserve. In addition, the sawmill would be build precisely at the site of Adjela and Ngoulemakong villages and an encampment of Baka "pygmies" —an indigenous population that is facing serious threats to its culture and lifestyle.

The Bakas were invited to attend meetings with the chiefs of the two villages, local government authorities, and logging company officials. But the meetings did little to ensure true Baka representation. The Bakas are reluctant to assert themselves, in part due to generations of domination by their Bantu neighbors. (Bantus are the ethnic majority in much of sub-Saharan Africa.) In this case, the Bakas did not have the opportunity to express their point of view. The company seemed to feel that the Bantus were the only local stakeholders, and that only their point of view mattered. The nonviolent and reserved nature of the Bakas led to their marginalization.

The site chosen for the sawmill comprised a three-hectare area that overlapped the pygmy encampment and was less than 300 meters from the waterway that marked the boundary of the Dja Reserve. This placement ensured that the Baka's village would be destroyed and that pollution would enter the river and the reserve. The Bakas, who generally have a harmonious relationship with nature, were quite surprised when large machines came and destroyed their houses and crops. Many of them were left homeless and had to cross the waterway and settle in the reserve.

On April 8, 1998, the senior divisional officer for the Upper-Nyong Division presided over the laying of the foundation stone of the future sawmill during a grandiose ceremony that drew a large crowd. The Bakas looked stoically at the vast area that had been cleared, dug out, and made ready for construction. Remains

of the Bakas' destroyed crops and houses surrounded the area.

Problems Created by the Location and Preparation of the Sawmill Site

The sawmill site created both ecological and social problems.

From an ecological perspective, the site chosen for the sawmill was problematic because it was very close to the Dja reserve. The development of the sawmill in that site had great potential to negatively impact the reserve. The Ministry of the Environment and Forestry had acknowledged the likelihood of an adverse impact.

From a social perspective, the Baka were not given an adequate chance to participate in the planning and decision-making about the placement of the sawmill. In addition, they were displaced from their homes and lost many of their crops. Although some compensation was made to the inhabitants of the villages where the sawmill was located, none of the money got to the Baka peoples. Rather, it was either given to, or intercepted by, the Bantu villagers.

Step 1: Deciding what issues to monitor

This case was chosen for a lobbying program for the following reasons:

- More than 100 individuals belonging to a marginal group (the Bakas) were displaced and their crops destroyed.
- The decision to displace the Bakas was taken without consulting them, and the Bakas were not compensated.
- The establishment of the sawmill on this site did not appear to conform with Cameroon law 94/01, which stipulates that protected areas be surrounded by a buffer zone.
- The sawmill on this site presented risks to the natural environment, including pollution, facilitation of poaching, destruction of community property, and noise.
- Some local authorities seemed to be collaborating with the company, which CED believed was partly due to insufficient information on the potential negative impacts of installing the sawmill in Lomié.

Step 2: Determining the Desired Outcomes of the Monitoring Campaign

Concerning this sawmill project, CED defined the following objectives:

- Persuade government authorities to stop the project because of violations of law 94/01.
- Enable the communities whose property had been expropriated to exercise their rights to compensation for illegal taking of property and livelihood.
- Protect the affected marginal communities against the abuses of loggers and some authorities. In this particular case, the abuses included the right of the Baka community to freely choose where to settle and the right to use the natural resources found in the immediate neighborhood. CED's aim was to draw public attention to this new violation of the fundamental rights of an oppressed people.

Step 3: Analysis of the problem, the parties involved, and how they operate

CED's analysis of the situation showed that the following parties were either affected by the problem or could help resolve it:

- The Baka communities of the encampment;
- The Bantu communities of Adjela and Ngoulemakoung;
- The regional government official and the mayor of Lomié.
- Officials of the Hazim-Boitex lumber company;
- The senior divisional officer for the Upper-Nyong division in Abong-Mbang

and the divisional delegate of the Ministry of Environment and Forestry;

- The Ministry of the Environment and Forestry and its sub-director of Forestry Exploitation;
- International NGOs and diplomatic organizations;
- Major conservation programs, including World Conservation Center (IUCN) and the Dutch Development project, Soutien au Développement Durable dans la région de Lomié (Support for Sustainable Development in the Lomié region, or SDDL);
- Local NGOs, such as the Centre International d'Appui au Développement Durable (International Center of Support for Sustainable Development, or CIAD); and
- Other environmental NGOs.

Step 4: Choosing targets and allies

The following organizations were seen as our allies in this campaign:

- CIAD, which spearheaded the program and organized the field work;
- The IUCN-Dja project based in Lomié, which provided technical and financial assistance to CIAD;
- CED, which provided technical and planning assistance to CIAD;
- The London-based Rainforest Foundation, which provided technical assistance to CIAD for activities in the field;
- The Environmental Defense Fund (EDF) in Washington, D.C., which supported CIAD in discussions with the administration and with local communities;
- The Ministry of the Environment and Forestry's sub-director of protected areas, based in Yaoundé, who helped in the preparation of a ministerial decision to stop the project.

It should be noted that, from the outset, it was difficult to anticipate the role of the central administration. After receiving information relating to the project, some officials of the central administration had a positive and encouraging reaction.

Step 5: Choosing Methods of Action

CED and its partners (mainly CIAD) identified four methods to reach our identified goals:

- Educate key groups by publishing an information document summarizing the problems at hand;
- Establish contacts with NGOs, communities, administration officials, and government officials to have the fundamental rights of the indigenous people inhabiting the sawmill site respected and to uphold the provisions of the forestry law relating to protected areas;
- Publish articles and information in CED's newsletter, *Bubinga;* and
- Hold educational information sessions with the Baka and Bantu communities at the project site.

The aim of the educational sessions was to ensure that the communities shared the same perception as organizations active in the project. Concerned organizations sought to convey the message that they were not opposed to the development of the Lomié region and did not want to limit the employment possibilities of local youth. Their aim was simply to protect the Baka population and the reserve.

Step 6: Gathering the data

CED used the following sources for the information needed to conduct the campaign:

- The local community for information concerning the events that took place on the site;
- The sub-department of Forestry Ex-

ploitation, for the contents of the specifications; and

- The statements and official documents of the Hazim-Boitex company.

Step 7: Analyzing the data and writing the reports

Meetings were held in Lomié between CED and CIAD, between CIAD and IUCN, and between CIAD and the affected communities. The aim of these meetings was to define the best strategy to be adopted for the law to be enforced.

In addition, meetings were held in Yaounde between CED, EDF, and CIAD; between CED, CIAD and the Rainforest Foundation; and between EDF, CIAD, and the Subdirector of Protected Areas.

These groups are continuing to exchange information.

Information about the issue was published in the form of a brochure by CIAD. Articles also were written in the *Bubinga* newsletter. The aim was to ensure that this information was widely disseminated.

Step 8: Communicate the results of the campaign and advocate for better environmental and social policy and management

Some 100 copies CIAD's brochure were printed and distributed to local and central authorities, local and international NGOs, and diplomats. Two articles, a report, and an interview were published by CED in *Bubinga*. Meetings were held with the Baka and Bantu communities at the project site.

Step 9: Self-analysis

This step has not yet occurred.

Results of the Campaign as of December 1998

The project was stopped in June 1998. A new site for the sawmill was chosen one month later.

Remaining Challenges

Despite the success of the campaign, some problems have not been addressed, including the question of compensating the communities whose houses and crops were destroyed. Another unsettled issue is what to do with the three hectares that were cleared, dug out, and then abandoned.

COMITÉ NACIONAL PRO DEFENSA DE LA FAUNA Y FLORA (CODEFF), CHILE

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By Hernan Verscueure S., translated into English by Ruth Nogueron

Introduction

Since its creation in 1968, Comité Nacional Pro Defensa de la Fauna y Flora (CODEFF) (The Fauna and Flora Defense Committee) has been dedicated to the conservation of the Chilean forests, particularly in four areas:

- Research and monitoring to generate pertinent, independent, and high-quality data;
- Information dissemination to keep local communities and general society informed about the state of Chile's forests;
- Environmental education to encourage changes in the attitude of society toward the environment; and
- Environmental action to participate in environmental management decisions and encourage other nongovernmental groups to participate as well.

The Importance of Independent Monitoring for Chile's Forests

The monitoring of forest resources should be a state task through the National Forest Corporation (CONAF). Nevertheless, the role of general society and CODEFF in monitoring is important because it

- Allows an objective and independent assessment of forest ecosystem conservation based on direct field observations;
- Provides a tool to facilitate better stewardship of the forest;
- Provides a means for society to participate in the management and conservation of the forests;
- Generates knowledge that is useful in formulating forest-conservation policies;
- Provides vital information for use by CONAF in managing Chile's forests; and
- Furthers the ability of Chile's population to determine the country's affairs.

The State of the Forests

Chile's forests are experiencing a high rate of loss and degradation. Currently, 18 arboreal and bush species are classified as vulnerable and 9 are endangered. The main pressures on Chile's forests are the substitution of natural vegetation by plantations; high-grading, or selective harvesting, in which only the best trees are cut; the expansion of agriculture-related activities into forested areas; infrastructure projects; uncontrolled grazing in forest interiors; and fires. According to official numbers from the Forestry Action Plan, forest destruction and degradation totals about 120,000 hectares per year.

Institutional and Political Background

The forestry sector is one of the most active in Chile and has recently experienced enormous growth in production and exports. Forest plantation land has grown on a par with the overall industry, with 80,000 hectares of plantations added annually during the last 10 years. The total area covered by plantations in 1997 was 2.12 million hectares. Industrial facilities such as wood pulp plants have grown significantly as well. To date, there are six wood-pulp plants, with two more expected in the near future.

In addition to being an important trade commodity for Chile, the forest sector is an important source of employment. Between 1980 and 1992, it provided an average of 78,580 jobs, including technical, non-technical, and professional positions. The development of Chile's forest sector is a direct result of the nation's liberal economic policies. Such policies favor the private sector and stimulate production of products for export.

During the 1970s and 1980s, there was a transition in Chile's economy from the state to the private sector. In addition, a legal framework was developed to change the government's role from executing policies through legislation to promoting policies through financial incentives. For example, a 1974 bill established that 75 percent of the expenses in the establishment of plantations would be financed by the state.

Despite the gains made by forestry companies, landowners, and workers, there are still questions regarding the true contribution of the forestry sector to Chile's national development. The environmental and social costs are great enough to rival the economic gains. These environmental impacts include the substitution of productive and diverse native forests with monoculture plantations. According to official data, 140,000 hectares were converted to plantations between 1985 and 1994. These conversions have altered water and nutrient cycles, reduced soil fertility, and increased soil erosion. Habitat necessary for wild fauna has been lost; the landscape has been sharply modified; and diversity has been reduced. Finally, plantations have generated serious pollution, both directly through the use of agrochemicals for the control of insect infestations and disease, and indirectly through wood-pulp production processes.

Among the social impacts, the concentration of forestland in the hands of relatively few people has increased migration to cities. Loss of access to the services and products generated by natural forests has increased unemployment and poverty, and altered local cultures. CODEFF has documented all of these trends.

Awareness of the situation facing Chile's forests and the communities that depend on them has been growing. This awareness has not spread to the private sector, however, and has had relatively little impact on government officials. The political sector is very important because many of the solutions to these problems will need to come about through the passage of forest-sector laws. The laws governing Chile's forests need to emphasize sustainable management of native forest and plantations.

Independent monitoring can play an important role in bringing about improved forest policies. Monitoring generates information needed to determine forestry policies, increase the awareness of society, and stop the destruction.

Organization

Mission

CODEFF's mission is to promote environmental conservation and achieve sustainable development.

CODEFF's Forestry Program Objectives

CODEFF's forestry program contributes to the overall mission by supporting the recognition of native forests as a vital national resource and promoting the importance of forests as a vulnerable natural resource that should be managed under sustainable practices. To achieve this goal, a number of objectives (and sub-objectives) for the forestry program have been defined. These objectives constitute CODEFF's Forest Program Action Plan.

The forestry program's objectives are to

- Develop monitoring activities and permanent control of the exploitation of the forests;
- Influence public and private sector policies to promote sustainability;
- Improve the state's role in planning and controlling activities in forested areas;

- Promote sustainable management, especially among small- and medium-scale proprietors in forested areas; and
- Conserve relevant forest species.

The Monitoring Program Sub-objectives

The general sub-objectives are to

- Create and enforce forest policies focused on sustainability;
- Increase awareness of forestry issues in Chilean society and government;
- Create a technical base to inform and back up CODEFF's policy initiatives;
- Stop the destructive uses of native forests; and
- Strengthen CODEFF's ability as part of civil society to participate meaningfully on issues of forest management.

Specific goals include issuing annual reports on the state of native forests and developing methodologies to evaluate specific cases of forest destruction.

Networks

In order to promote society's participation in monitoring forests, CODEFF created the Forests Monitoring Network (REMFO) with the sponsorship of the World Wildlife Fund-US and World Wildlife Fund for Nature-International The network is open to the public and to institutions interested in collaborating in monitoring actions. Also, the system has 136 individual memberships and 80 institutional memberships in several regions in the country. Some members support activities at the local level. Furthermore, REMFO publishes the bulletin *Bosques Templados (Temperate Forests)* to spread relevant information on the issue.

Forest Action Plan

Monitoring is part of CODEFF's Forest Program Action Plan. The plan is created for a period of three years and is evaluated every year. Field data collection is planned and executed systematically based on the National Monitoring Plan, which is reviewed once a year with the participation of the members of the forestry program. The forestry program includes all staff working on forestry issues in seven of eight state branches.

THE MONITORING PROGRAM

Identification of Plot Areas

The process of identifying plot areas is done using 1:250,000 scale cartographic charts from Chile's Military Geographic Institute. The selection of areas is based on the amount of native forest cover and the pressures they are experiencing. It is important to note that CONAFF and several universities have developed the Native Vegetation National Cadastre (Catastro Nacional de la Vegetación Nativa) The cadastre, or register, contains digital information maps at scales of 1:50,000, 1:250,000, and 1:3,000,000. CODEFF has access to these maps, thanks to an agreement with CONAFF.

CODEFF commonly uses overflights to identify areas where field monitoring should be conducted. As seen from the air, it is easy to identify selective cuts, clearcuts, and burned areas (both those from fires set after clearcutting and those not related to cutting).

Identifying Areas with GPS

As part of the overflight process, areas that appear to warrant field monitoring by CODEFF are marked using the Global Positioning System (GPS) and photographs of the areas. All the information related to the photographs is recorded. This process requires at least two persons in the airplane. After the flight, the plots identified are drawn on the map according to the recorded points of reference and the GPS coordinates.

Data Gathered in the Field

The field visits enable the gathering of more detailed data, including:

1. The location and how it is accessed.
2. Name of the property.

3. Name of the proprietor and enterprise involved in the area.

4. Type of intervention (such as whether the area has been clear-cut to establish a plantation, selectively cut to produce lumber, and so on).

5. Type of vegetation and fauna affected. These data are obtained from nearby undisturbed areas.

6. Amount of wood and species harvested. This is calculated by establishing inventory plots in cut areas, using stumps as the basis for the measurements. This method can be problematic, because accessing the stumps is difficult if the vegetation has not yet been burned. Also, it can be difficult to identify tree species using only stumps. However, reconstruction of the cut plot can be accomplished by establishing plots in adjacent areas with similar vegetative cover. If none of these techniques can be applied, any available data are collected even if they do not have statistical validity.

7. Topography of the area.

8. A description of the bodies of water and how they have been impacted, as well as development activities in the forests (roads, for example) are included in the data collected.

9. Design of logging roads.

10. Photographs.

Communication

Reports

A standard format should be designed for all reports, especially periodic monitoring activities. The format should assume that the audience includes readers who are not experts on the issue. It should include graphics and photographs. In order to present the most current information, reports should be published within 30 days of being completed.

CODEFF's reports are read primarily by government officials, the media, and the general public. The reports should be written in a simple way without compromising the technical rigor. The information can be delivered through a technical report for dissemination complete with excerpts referring to particular cases. Depending on the target group, the cases should be as detailed and technically complete as possible.

Along with the formal reports, press releases are prepared for distribution during the press conferences, at which the reports are presented.

- The external reports should include, at a minimum, the name, location, and ownership of the property; how the property can be accessed; the name of the contractor responsible for the work; the characterization of damage caused by logging; any laws that have been broken; and recommendations for action by the government or the company involved in the work.

CODEFF's internal report should also include an evaluation of the event, including the identification of obstacles and opportunities to be considered in further actions, and an expense report.

Dissemination of Information to Authorities and the Media

CODEFF delivers its reports directly to CONAFF. It disseminates the information to the public through the media.

Following Through on the Monitoring

In assessing how to follow up its preliminary monitoring, CODEFF considers the importance of the case. Important cases usually end up becoming internal CODEFF campaigns, while lower priority cases are typically left to the government to handle.

When CODEFF decides to embrace a case as an internal campaign, a plan of action is drafted. This plan includes the allocation of human resources and technical and financial needs. Those cases left to the Chilean government are usually followed up by CONAFF and local police offices. CODEFF will also monitor the situation to determine whether the transgressions have ceased.

Example Of A Monitoring Project

Interregional Monitoring, 1995

Here is a description of a 1995 interregional monitoring project:

1. CONAFF located the routes to fly on the Military Geographic Institute maps using a 1:250,000 scale. The areas identified were the Precordillera de La costa y de Los Andes between the VII and X administrative regions of Chile (35 to 42 degrees south latitude).

2. Two flights were conducted with the support of the U.S. Lighthawk organization.

3. During the flights, the most relevant areas to monitor were identified and located with GPS. The areas were marked on the map and photographs were taken. Access roads to the areas were given special attention. In addition, clearcutting areas, selectively cut areas, and burned areas were identified.

4. Further details were gathered through field study. Thirteen previously identified points were visited using a four-wheel drive vehicle. The trip covered approximately 3,000 kilometers over 15 days.

5. After the field data collection, the data were processed and the correspondents' reports were prepared.

6. The report was presented to the public at a press conference and delivered to the political authorities, including CONAFF.

7. CONAFF follow-up investigations revealed that 3 out of 13 cases documented in the report were in violation of forestry laws.

8. The internal evaluation of this monitoring campaign plainly demonstrated the importance of the pre-monitoring flights. Based on this evaluation, a methodology to take data during the flights was developed. In addition, the methodologies to collect data on the ground, as well as the strategies to facilitate access to the areas to be monitored, were improved.

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By Joe Vieira, Manuel Mamani, and David Ricalde

Introduction

This case study provides an example of how the Conservation International (CI) program in Bolivia is using monitoring as part of its conservation investment in biodiversity within the frontier forest of Madidi National Park and Integrated Natural Area. Many other institutions also are working in the area, including the park staff itself, the General Directorate for Biodiversity at the Bolivia Ministry of Sustainable Development, the NGO EcoBolivia, CARE International, the Institute of Ecology at the University Mayor de San Andres in La Paz, and the Bolivian Museum of Natural History at the National Science Academy in Bolivia.

Organization

Conservation International—Bolivia (CI-Bolivia) is one of 23 CI country programs located in Latin America, Asia, Oceania, and Africa. CI-Bolivia's program and individual project activities have largely complemented the work of the Bolivian government as well as donors and NGOs in the protected area.

Projects, Objectives, and Activities

Since 1990, CI-Bolivia's programs and projects have focused on the southern portion of the Tropical Andes hotspot and adjacent wilderness area, and the 1.8 million hectare Madidi National Park and Integrated Natural Area. Since 1993, CI's higher objective has been to promote conservation biodiversity and sustainable development within and adjacent to frontier forests of the Madidi National Park.

CI's institutional objectives in the region have focused on documentation of biological diversity, park advocacy, assessment of cultural conditions, and support of Bolivian protected area policy through socioeconomic investment in a pilot community within the protected area. Activities completed under CI financing have included conservation training, transportation pro-jects, sustainable agriculture, ecotourism, handicrafts, strengthening local institutions, promoting health care access, developing potable water and public sanitation, and building local capacity in wildlife monitoring

The Monitoring Program

Monitoring for Learning

As part of an institutional learning system launched in 1996 under the CI Monitoring and Evaluation Program, we are assessing our investments of time and money and how they have impacted on the state of the ecosystems and socioeconomic conditions in four hotspot areas. Through our activities, we hope to strengthen teamwork, improve our strategic planning, and focus on future investment, as well as benefit the interested members of the public. Since February 1997, CI-Bolivia has focused on the following monitoring questions within the Madidi National Park region:

- How do we best perform objective, cost-efficient monitoring of our investments and our work?
- How do we link monitoring of our conservation investments with the monitoring of the ecological status and trends within the forest where we work?
- Which indicators tell us the most about the health of landscapes and wildlife populations, and the processes that link them in the ecosystem under study?
- What are appropriate analytical tools?
- What time frames adequately portray natural versus human-induced trends?

- How do we account for socioeconomic factors, natural resource use, and political indicators to clarify threats and trends influencing the health of ecosystems under study?
- How do we finance and establish a baseline for conservation trend analyses in future assessments?
- How do we educate ourselves in the process?
- How do we expand the capacity of our partners and other beneficiaries of the investments to continue the work of monitoring when we leave?
- Finally, how do we use the information that we generate to improve the work we do and influence the behavior of others?

The following overview of Rapid Biological Assessments (RAPs) and investments in Chalalan, San Jose Uchupiamonas, and the general Madidi area touch on some of these questions. In this case study, emphasis is placed on monitoring as it relates to conservation trends and impacts in the study area.

Initial Baselines and Biodiversity Threats (circa 1990)

In 1990, CI performed an RAP of the Alto Madidi, establishing a qualitative and quantitative inventory of various taxonomic groups in the core of this tropical wilderness (Parker et al. 1990). Scientists performed species inventories along elevation transects adjacent to a 30-year old abandoned logging camp and airstrip, covering no less than 1,000 hectares. By all measures of bird, plant, and mammal diversity, the area was characterized as a pristine and globally important refuge of biodiversity.

It was both the pristine status and isolated wilderness conditions in 1990 that drove the Parker team to recommend the creation of a park in the Alto Madidi watershed. In addition to documenting Alto Madidi's biodiversity in 1990, the RAP team of scientists also conveyed a qualitative warning of regional development trends threatening biodiversity among the region's 1.8 million hectares of upland and floodplain forests. Prevalent economic forces threatening the Alto Madidi and Tuichi watersheds included poverty, logging, colonization, and road development (Parker et al. 1990).

Community-based Forest Conservation Investments (1993-1994)

Three years later, CI anthropologists visited the then-proposed Alto Madidi protected area and completed a needs assessment. They documented the low impact of indigenous forest dwellers, as well as the human forces of poverty driving demands for road construction and logging activities by the 62-family community of San Jose Uchupiamonas. Reports and investment recommendations were submitted to the Bolivian government and international donors.

In 1994, CI's follow-up investments in Alto Madidi were launched in the community of San Jose Uchupiamonas. This indigenous community is situated inside the Madidi National Park and has largely been living off the natural resources provided by the forest. Agroforestry, river transportation, and socioeconomic project financing occurred at the same time as a regionwide commercial logging and hunting boom that spilled over from the adjacent Pilon Lajas Indigenous Territory and Biosphere Reserve to the proposed Madidi National Park.

Ecotourism Investment, Conservation Action, and Logging (1995-1996)

In August 1995, a crew of CI project planners, newly hired staff, and a journalist passed six logging camps en route to the Lake Chalalan and the community of San Jose Uchupiamonas (Vieira 1996a). One month later, Conservation International and San Jose Uchupiamonas launched a high profile sustainable development and ecotourism lodge project (the Chalalan Project) funded by the Inter-American Development Bank in the Tuichi River valley (Rioja and Atkinson 1995). This was followed seven days later by the Bolivian government's creation of the

Madidi National Park and Integrated Natural Area (DNCB 1995).

In 1993 and 1994, representatives from the Bolivian government had met with local community leaders in San Jose and elsewhere. Nevertheless, when the project was launched in 1995, most local communities (including San Jose) were largely unaware of the proposed protected area's status. In San Jose, communal distrust of government and outsiders was based on nearly 300 years of self-reliance and de facto resource control (Limaco 1994). In November 1995, CI's president visited the site of Chalalan and San Jose Uchupiamonas and attended a community general assembly. The president, a primatologist discussed the importance of the Madidi National Park to Bolivia, the region, and San Jose's own future (Vieira 1996b). Community leaders of San Jose criticized the park and stressed the importance of their socioeconomic needs, but recognized the value of biodiversity investment.

One week after the CI November 1995 president's, three colonist and logging interests were hosted by San Jose Uchupiamonas (Vieira 1996b). Each visiting group offered the community of San Jose Uchupiamonas financing for road construction, a sawmill, electricity, and potable water, in exchange for exclusive access to Mahogany stands in the Pavi, Tachiapo, and Isiliamas watersheds. San Jose Uchupiamonas formally declined external timber offers in December 1995 following a general assembly attended by CI Bolivia (Vieira 1996a).

Systematic Biodiversity and Impact Monitoring (1995-1998)

Monitoring "Limits of Acceptable Change"

In August 1995, CI began systematic monitoring of biodiversity indicators, resource use, and project impact within the Madidi National Park at Chalalan Lake under Inter-American Development Bank Financing (Parker et al. 1990). From 1995 to 1996, biological monitoring focused primarily on establishing a concept of "limits to acceptable ecological change" within a 3,500-hectare community ecotourism concession at Lake Chalalan (Vieira 1996a). Baseline data were collected on several taxonomic groups prior to and during construction of the Chalalan ecolodge.

Park-scale monitoring performed by CI and its partners included aerial overflights and low-tech analyses of satellite imagery acquired by the RAP. Landsat imagery of the area was compiled to evaluate trends in forest cover at landscape-scale, comparing dates prior to and following CI investment (Vieira 1996b).

Local Monitoring

By October 1995, the intensity of logging and hunting in portions of the Madidi—within the estimated 600,000 hectares of the lower Tuichi tributaries and humid Andean foothill forests that surround Lake Chalalan—were clearly affecting floral and faunal biodiversity. Uncontrolled logging and hunting activities at the scale described were recognized as direct threats to the Chalalan ecotourism lodge investment.

San Jose Uchupiamonas launched locally managed resource monitoring, focusing on hunting and logging activities. For nearly two years, the Chalalan community took the initiative and conservation responsibility for a conservatively estimated 25,000 hectares (Vieira 1996a). Staff patrolled the Tuichi river margin forest in the Chalalan Lake vicinity. Attention initially focused on the forests between Lake Santa Rosa, the Yariapo river, and the Atarisi canyon. Mahogany accumulation, river distribution, and illegal vehicle use at armed commercial logging camps also was observed and documented (Vieira 1996b).

The CI-Bolivia staff used baseline indicators to examine ecotourism impact (including trail condition, pre-project forest clearing, and pre-project trash accumulation) and initial lake water quality (chemistry, turbidity, and coliform counts). Monitoring information was used to direct investment in trail construction, site new buildings, and launch trash recycling and composting in the lodge.

Wildlife Monitoring

CI-Bolivia project staff contracted with biologists to work with community members from San Jose Uchupiamonas to intiate regular monitoring of wildlife presence (Hennesy 1996). San Jose community members and CI project staff have conducted continuous habitat monitoring for three years along the floodplain forest (300-380 meters in elevation), forest lake margin (380 meters), Rayamayo and Eslabon gallery forest (380- 420 meters), and Andean foothill forest (400-750 meters).

Resource Use Monitoring

Throughout 1996, CI-Bolivia staff recorded an average of 21,000 cubic feet of mahogany per boat on the Tuichi river. CI documented timber flows and hunting trends in the June 1996 Tuichi Report and launched an environmental education campaign as another long-term strategy in June 1996.

Ecotourism Monitoring

Tourism use by San Jose Uchupiamonas and Rurrenebaque at Lake Chalalan began in the 1970s. In 1996, baseline indicators of existing trail conditions, pre-project forest clearing, four-year forest regeneration, pre-project trash accumulation, and initial lake water quality (chemistry, turbidity, and coliform counts) were documented by CI-Bolivia staff.

Rapid Biological Appraisal and Conservation

CI planned a RAP training session in Madidi National Park in 1997 to increase national attention on the park.

In March 1997, Madidi National Park guards began an inventory of downed timber, posting signs along the Tuichi river and informing logging crews about the park's legally protected status. In the same month, San Jose leaders and lodge workers expelled loggers from two logging camps in the Eslabon river, seven kilometers from Lake Chalalan. They also constructed science facilities for an upcoming field workshop for Bolivian and Peruvian biologists.

Ecotourism Training, Operations, and Conservation

Three years of monitoring have shown measurable positive change in wildlife populations at Chalalan, including species particularly disturbed during the pre-project period of 1993-1995. Most notable is the frequency of two populations of white-lipped peccaries, and a gradual return of black spider monkey populations that most likely are from refuge groups in the Serrania Ridge. Since the inauguration of the Chalalan Ecolodge in June 1998, many clients have paid premium prices for birdwatching, wildlife viewing, and adventure tourism.

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Introduction

This case study is an example of the successful application of high-tech remote sensing monitoring tools.

Remotely sensed data—especially satellite imagery and aerial photos—have played an important role in conservation for decades. Simple black-and-white or color composite images often have great scientific and political utility. Because much remotely sensed data can also be obtained in digital form, scientists and natural resource managers have many ways of processing and analyzing data to gain a greater understanding of land use and land change in a given area. The emergence of powerful and inexpensive computers and software in the late 1980s made digital processing much more accessible to land managers. This case study documents the use of remotely sensed data that was collected from Guatemala's Petén region from 1986 to 1997; the evolution in the use of such data; and the broad social, political, and scientific impacts of its use.

The change detection image and associated statistics produced in 1996 made it possible to see where, when, and how fast change was occurring throughout the Maya Biosphere Reserve. Because change data are digitally based, it is possible to view change data at many scales, ranging from the 2 million-hectare reserve to the 687-hectare Biotopo Cerro Cahui. Change data can be obtained for any management unit—such as a national park or community resource management concession—that can be defined with a Geographic Information System (GIS). Important linear features, such as roads, waterways, pipelines, and international boundaries can be detected and monitored with this technology.

In 1988, Thomas Sever, then with the U.S. National Aeronautics and Space Administration's Stennis Space Center, brought to Guatemala the first black-and-white LANDSAT image of the northwestern corner of Guatemala, where the Department of Petén borders the Mexican states of Tabasco and Chiapas. The image clearly shows the political boundary of Guatemala, because Tabasco farmers and cattlemen have cleared the forest up to the international boundary (National Geographic 1988. James Nations, then a senior Fulbright research scholar in Guatemala and technical advisor to the Guatemalan government's fledgling environmental agencies, showed this photo to a half-dozen Guatemalan conservationists. When he showed it to Andreas Lehnhoff, then the executive secretary of the National Council on Protected Areas (CONAP), Lehnhoff asked if he could have it to take to a meeting the next day with Guatemalan President Marco Vinicio Cerezo. Nations gave him the image. During his meeting the next day in the National Palace, Lehnhoff spread the image out on the table and gave the president a quick explanation of what it was. Cerezo, shocked and amazed, called his secretary over and said, "get the Mexican ambassador on the phone, I need to talk to him." Years later, Cerezo pointed to that satellite image as one of the factors that prompted him to sign the 1990 law that created the Maya Biosphere Reserve.

The Maya Biosphere Reserve

The great lowland forests and wetlands of northern Guatemala, southeastern Mexico, and northern Belize—collectively the Selva Maya—are under enormous threats. The threats stem from logging, ranching, oil development, and small-scale agriculture, combined with rapid population growth, little high-level political support for conservation, and sociocultural prob-

lems dating back hundreds of years. The problems are especially severe in Guatemala's northern Petén region.

In 1989, to help address the problems of widespread deforestation, the Guatemalan Congress created a framework for a countrywide system of protected areas. In 1990, the Maya Biosphere Reserve, which spans much of the northern Petén and, at 1.6 million hectares, occupies nearly 15 percent of Guatemala's land mass, was declared a protected area. The reserve's many ecosystems harbor a wealth of biodiversity, act as a carbon sink of global importance, nurture a well-established forest society, and provide employment to thousands of families.

In 1991, the United States (through the United States Agency for International Development) and Guatemala agreed to establish the Maya Biosphere Reserve Project. The project's goal is to conserve the biodiversity, culture, and natural resource economies of the reserve. The measures needed to achieve this goal include (after Schwartz 1994):

- A coherent set of environmental policies on issues ranging from oil development to timber harvesting;
- A strengthened, decentralized national park service with local, regional, and national political support;
- Resolution of land tenure problems within the reserve (and the Petén generally);
- Collective, community-based control of local natural resources; and
- Environmentally sound economic alternatives, including mainstream and nature tourism, tailored to benefit people living in and near the reserve.

The Monitoring Progam

Conservation International (CI) joined the Maya Biosphere Reserve Project in late 1991. By early 1992, CI had opened offices in the Petén's capital, Flores, and started recruiting staff. Its initial task in the project was to help develop community-based natural resource management systems, together with economic alternatives.

At the start of the Maya Biosphere Reserve Project, there was little systematic information on the location and rates of deforestation in the reserve. There were several efforts to characterize deforestation in the region, but they were either too broad in scope (covering the entire Petén and thus without sufficient spatial resolution); too narrow to give a sense of what was happening in the entire reserve; or not accurate enough to provide useful information. Also, important physical features such as protected areas, roads, and communities were not combined with deforestation analyses in any systematic way.

Data availability was also a problem. Guatemala's Planning Secretariat, the one institution in the country with significant amounts of satellite data before 1996, was reluctant to grant CI, other NGOs, or even other government agencies access to their data. The satellite data were not available in digital format, but only as very large format prints that were difficult to use.

As a result, even though the governmental and nongovernmental institutions responsible for carrying out the Maya Biosphere Project knew more or less where deforestation was occurring, they were unable to accurately pinpoint, quantify, and monitor this deforestation. Given the need for a basic measure of landscape-level land use and land cover change at several scales, CI sought to develop a system to monitor changes in the forest cover The objectives of that system were to

- Improve both the overall and site-specific understanding of deforestation trends;
- Establish a forest cover baseline for specific dates that could be periodically updated to track changes in forest cover;
- Create a communications tool for use with both policymakers and the general public;
- Provide a management tool for the Maya Biosphere Reserve project and other efforts dedicated to conserving the resources of the reserve;

- Compare deforestation rates and trends within the reserve to those within the buffer zone, which provides some indication of the protection status and threats to the reserve borders; and
- Widely disseminate deforestation trend information to governmental and nongovernmental institutions.

Choosing a Methodology

CI initiated the change detection project in late 1995, and decided to use widely available and relatively high-resolution (30m) Landsat imagery. According to Sader (1996), time-series analysis of satellite imagery offers the best opportunity to visualize and quantify forest-clearing patterns in the remote northern Petén region, which was practically undisturbed prior to the mid-1980s.

Data Acquisition and Analysis

Landsat imagery for 1986, 1990, 1993, and 1995 (covering about 90 percent of the Maya Biosphere Reserve) was acquired in 1996. A Normalized Difference Vegetation Index (NDVI) was calculated for all four dates using ERDAS-Imagine image processing software. Field visits were conducted to observe ground conditions and confirm the sensitivity of the change detection classification method. The change image was also compared with a 1995 Landsat color composite of the area. Cloud and seasonal flooding contamination of the images were edited out using GIS. The boundaries of protected areas, major roads, towns, rivers, and other geographic features were also added. A change detection image for the 1986-1995 period was produced and distributed to the public in November 1996. In early 1998, 1997 imagery was acquired and added to the image. The resulting image has eight classes of information: wetlands, forest, water, pasture/agriculture/urban areas, and forest change 1995-97, forest change 1993-95, forest change 1990-93, and forest change 1986-90.

Results of the Change Detection Analysis

The data confirm and quantify what resource managers have known all along, but have been unable to determine or track precisely until the advent of this change detection technique. Most deforestation is occurring along the Tabasco-Petén border, the Rio San Pedro near El Naranjo, the road to Melchor de Mencos, the southern and eastern portions of Sierra del Lacandon National Park, and the area surrounding the oil-related infrastructure in Laguna del Tigre National Park. These are areas where it has been very difficult to establish and maintain government or NGO conservation presence, in part because they do not have adequate all-weather roads or decent river access.

The NDVI change detection process produces both a visual change detection image and statistics for change and land area that correspond to the eight different classes of information. Estimates of forest change are reported as rates in percent per year. Rates of change are computed based on the total area of recent forest clearing in the time period divided by the total area of forest and wetland classes at the beginning of that time period. Thus, the change reported is relative to the undisturbed forest and wetland base that exists at the beginning of a time period. This area is almost always less than the size of the protected area under the May 1990 law that created the Maya Biosphere Reserve, and, in most cases, has been decreasing over time.

There are several important conclusions to draw from the data. First, relative rates of ecosystem change are much higher for the buffer zone than for the multiple-use zone throughout the period of the analysis. For the 1990-93 period, yearly change was nearly 17 times higher in the buffer zone than in the multiple-use zone. For the 1993-95 period, change was 15 times higher in the buffer zone, and for 1995-97 13 times higher. In an encouraging sign, rates of change decreased in the buffer zone during 1995-97, after increasing throughout the 1986-95 period, while the multiple-use zone and core-zone change held steady, also after having increased consistently during the 1986-95 period. In the case of the buffer zone, change may be decreasing because the amount of remaining forest is dwindling.

Communication

The release of the maps depicting deforestation in the Maya Biosphere Reserve had a dramatic impact on the country and the management of the reserve. In November 1996, CI hosted a press conference with CONAP and Guatemala's National Commission on the Environment (CONAMA) to unveil the 1986-1995 change-detection image of the Maya Biosphere Reserve. This was the first time a satellite image of the entire Maya Biosphere Reserve had been put on a single page of paper.

The "wow factor" is one of the strengths of mapped remote-sensing data. Politicians and decisionmakers almost always have a strong reaction when they see an objective illustration of what the situation looks like from space. The news of the maps made the front pages the next day of the major Guatemalan newspapers. Prensa Libre, Siglo 21, and El Grafico, leading to a spate of articles on the state of the reserve. The images clearly served to raise awareness on the part of the media. One editorial writer remarked, "I came away amazed. Though I had a vague idea of what was happening in the Petén, I had not imagined the extent of the damage, nor how much change had occurred in 10 years in the forests and savannas of the Maya Biosphere Reserve" (Villatoro 1996). Many other articles also expressed alarm at the level of deforestation in the Petén and called on the government to take decisive action (Castro 1996).

On a negative note, the event soured relations between CI and CONAP, because CONAP officials began taking heat in the press for "not doing their job" to protect the reserve. CI had involved CONAP and CONAMA in the preparations for the press conference, and had shared advance copies of the change images with officials from these institutions. CI had viewed the event as an opportunity to raise awareness at the national level concerning problems in the Maya Biosphere Reserve and, perhaps naively, thought that this might help strengthen the hands of CONAP and CONAMA. Indeed the top officials of CONAP and CONAMA had eagerly agreed to participate in the press conference. CONAP officials became very defensive, however, once the press and others began criticizing them for the problems in the Petén.

The press conference sparked a great deal of interest in the uses of remote sensing, particularly on the part of NGOs and government agencies working in the Petén. CI was besieged by requests for data in late 1996 and early 1997. The organization had not anticipated such a strong demand and was unable to satisfy requests in an orderly and systematic way for some months after the presentation, resulting in criticism of CI-Guatemala. (One lesson from this experience is that there must be a distribution strategy and capacity in place before high-profile data are presented to the public.)

The change detection images made clear the utility of remote sensing and associated products, but CI was not the ideal place for a centralized repository of information on the Maya Biosphere Reserve. This task is best carried out by a government natural resource agency that genuinely allows easy access to data or by an NGO dedicated to this purpose. Realizing this, CONAP in mid-1997 established a data monitoring and analysis center in the Petén (CEMEC) with U.S. Agency for International Development funds and technical assistance from CI and other NGOs in the region. This monitoring center has done very well. For example, shortly after its establishment, CEMEC produced maps that showed how proposed oil concessions would overlap with core zones of the reserve. These maps were instrumental in persuading the government to withdraw these concessions from the international bidding round held in Houston in November 1997. Thus, as a direct result of the change detection images, local capacity to acquire, process, and analyze remotely sensed data has increased dramatically.

Part of CEMEC's responsibility, along with its NGO partners, other national government agencies, and local governments, will be to establish a long-term monitoring scheme for the reserve. Remotely sensed data and change detection products form an essential part of this monitoring system. Sader (1996), for example, proposes a

system for ongoing monitoring based on a standardized 100-km^2 UUTM grid. Long-term monitoring based on management units (such as parks, community concessions, and corridors) is also possible.

Community-Level Impacts

Change detection images and other remote sensing products also have many uses at the community level. Well before the change detection images were presented to the press in Guatemala City, CI staff in the Petén were using images to help communities inside the Maya Biosphere Reserve understand where they fit inside the reserve. A particularly useful technique is to identify waterholes and other landmarks that can be seen easily on the images. These are then presented to communities, often as part of a slide show describing the Maya Biosphere Reserve and the activities of CI. In many instances, rural people have never seen a satellite image or aerial photo, and certainly not one where they can recognize the landmarks. CI field staff say it is like "light bulbs going off" when people suddenly understand the broader context in which they live. This understanding leads directly to greater environmental awareness and support for conservation activities. In those communities in the reserve where CI has been active, environmental awareness had grown dramatically since 1992 (Schwartz et al 1996).

Changes in Park Management

The images instantly became an essential part of the strategic management of the reserve. In 1996, the U.S. Agency for International Development began reorganizing the Maya Biosphere Reserve Project to reflect a "results framework" loosely based on the logical framework approach that the agency pioneered in the late 1960s.

The results framework helped focus project efforts in specific geographic areas and established a set of progress indicators to be shared by all project participants. The change images supported this process by highlighting areas of rapid deforestation. The statistics on forest change provided accurate and timely information for a key indicator: deforestation.

In early 1997, the U.S.Agency for International Development organized a series of meetings with project participants designed to produce an "integrated" yearly workplan based on the results framework. A large-format version of an image showing changes from 1986 to 1995 was prominently displayed at those meetings. It was impossible to ignore the rapid change in and around Laguna del Tigre and Sierra del Lacandon national parks.

The Monitoring Program, Phase Ii

Settlement Mosaics

As part of CI's work in Laguna del Tigre in 1998, several mosaics of newly established settlements were created from photos obtained during July overflights. These are useful for demarcating boundaries, establishing management plans, and creating environmental awareness.

Aerial Photos in Conjunction with Satellite Imagery

Sader (1995), in a study of forest clearing around roads in the Petén, found that about 90 percent of forest clearing between 1986 and 1990 took place within three kilometers of established roads. Combining aerial photos with satellite imagery is useful for quantifying and monitoring these indirect effects (especially colonization) of oil and road development in tropical forest areas.

CI-Guatemala created an aerial photo mosaic of 36,000 hectares of the most heavily affected land around the oil infrastructure in Laguna del Tigre. A detailed change-detection analysis was conducted using this mosaic overlaid on 1995 satellite data. The analysis revealed that over 4 percent of this 36,000-hectare area was cleared from 1995 to 1997. Nearly all the clearing took place near the oil road and pipeline corridor.

The Benefits

A major benefit of change detection are the data showing where the roads and colonization points are, what kinds of forests are out there, and where environmentalists need to concentrate forces.

This information is important both in areas undergoing rapid change and in large, remote areas where field data collection is difficult and expensive. The technique described in this paper provides a landscape-level perspective as well as detailed information about changes at the community and even farm level.

Change detection data are easy to use once image processing has been completed. Although best done in a well-equipped remote-sensing laboratory, image processing can be accomplished at the field level if appropriate equipment and personnel are available, especially once initial procedures have been established. Manipulation and analysis of processed data can certainly be done at the field level. Increasing computing power, new software, and better telecommunications should continue to lower the barriers to country and field processing, manipulation, and analysis.

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By Amy R. Sweeting and Ian Bowles

Introduction

In the past decade, we have seen a change in the nature of threats to conservation in the areas in which we work. Although the primary concerns of conservationists formerly included the threats of agricultural expansion, migration, and slash and burn deforestation, the ecosystems we are working to protect now are under growing threat from large-scale industrial development such as natural resource extraction through oil and gas exploration, logging, and mining. Developing countries are harvesting their natural resources at a rapid pace to meet the growing global demand for fossil fuels, timber, minerals, and other resources, and for their own need for foreign capital and economic development.

Organization

CI's Policy Department

The Conservation International (CI) Conservation Policy Department was formed in 1993 to provide technical support to field projects in four major programmatic areas: conservation policy and law, natural resource economics, innovative conservation financing mechanisms, and reform of and collaboration with international development agencies. In addition to working closely with other CI programs to implement individual projects in the field, the department also focuses on a number of global-level issues (such as resource extraction) that affect every region in which we work.

Objective of the Extractive Industries Project

The objective of the extractive industries project is to promote the best practices possible by extractive industries. This demands that we understand these industries and become informed participants in the debate over whether and how resource extraction should proceed in certain sensitive ecosystems.

For each extractive industry, our approach varies slightly based on economic, technical, political, and scientific factors.

Oil, Gas, and Mining. The oil, gas and mining strategy has been to make relevant technical information available to all stakeholders concerning best technologies and practices, to work directly with selected companies, and to encourage a regional planning approach that will steer development away from ecologically sensitive areas.

Timber Extraction. With timber extraction—a form of resource use typically characterized by a larger "footprint" of activity—we have been rigorously documenting the overall trend in large-scale logging, particularly by multinational firms, and communicating our findings to decision makers and the media.

The Monitoring Program

The monitoring program has focused on tracking the presence of oil and gas, mining, and timber concessions. This involves compiling information on the companies that hold these concessions and the basic processes and impacts of each industry. This information serves two complementary purposes. First, it helps to highlight both the degree and the immediacy of the threat to conservation, increasing our ability to attract both support and funding for conservation activities.

Second, it makes us better informed participants in the negotiation process, giving us more credibility with governments and industry, and a greater ability to effectively assist our partner NGOs and communities in the field.

Gathering Basic Information

The first step in tracking natural resource extraction is acquiring a fundamental understanding of the industries that we are planning to monitor. We used a deliberate process to acquire this understanding.

1. The investigations began with research using books, industry journals, the press, magazines, company reports, and other printed materials, as well as electronic sources such as databases and the Internet, to gain a general understanding of each industry.

2. Equipped with this basic knowledge, we then interviewed experts in the field from organizations ranging from the World Bank to national governments to individual companies.

3. In several cases, we supplemented our research with site visits to oil, mining, or timber operations in order to gain a first-hand understanding of the processes.

4. We then input the information on maps showing the exact locations of individual concessions.

5. Finally, we researched which company or consortium of companies had rights to each concession.

Finding the Ownership of Concession Rights

For the oil, gas, and mining industries, this research is relatively straightforward. Governments generally offer concessions in public bidding rounds, whereas companies—at least the large international ones—are usually forthcoming with information about which concessions they are working (although the exact spot where exploration is focused may be more confidential). Oil, gas, and mining companies also often have web sites that detail their concession locations or present maps in their annual reports

However, tracking the activities of logging companies has proven much more of a challenge. The large international companies are often very secretive, even hiding behind local company names. Nevertheless, it was possible to find the responsible companies through extensive research. We used sources such as the U.S. Library of Congress databases, electronic information services such as Lexis/Nexis, published and unpublished materials, and annual reports. Using these sources, we were able to identify most of the major foreign logging companies active in key conservation areas in the tropics.

Communication

We used maps, reports in the forms of policy briefs, and a database. These products have given CI tools to impress upon governments and other target audiences the extent of the problem, even helping to inspire the creation of a national park in Suriname. The project has also allowed CI to improve the effectiveness of some of its other activities

Maps

Global Maps. It was decided that maps would be the most effective and simplest way to communicate findings on these extractive industries. We developed two mapping techniques to show both the rate and scale of increase in oil, mining, and timber concessions.

Our first map project was a large-scale "Extractive Industries in the Biodiversity Hotspots" map. This world map used colored dots to show the approximate location and number of existing oil, gas, and mining exploration and development sites, was well as proposed or current timber concessions, within the tropical biodiversity hotspots and wilderness areas where CI works.

For each section of the map, we developed numbered guides to the individual dots that corresponded to a database of company names, concession names, geographic locations, size of concessions and, in the

case of mining, which mineral was being developed.

This global map was not designed to represent a complete analysis of the distribution of these industries throughout the world, nor the degree of coincidence with biodiversity hotspots. Rather, it effectively illustrated the specific occurrence of these concessions in key conservation areas. We plan to continue refining this map over the next several years.

Time-Series Maps: The global maps are meant to highlight overall trends and the need for broad-scale regional planning of resource extraction. However, showing concession locations, effective project, and local-level conservation requires more specific detail on each country, including the size and shape of concessions and the rate of expansion. To meet this need, we have developed several sets of "time-series" maps.

These maps show existing timber, mining, or oil developments in various increments over the last several decades—for example, 20 years ago, 10 years ago, and today. Like the global map, the time series are accompanied by databases that offer more detail on companies, concessions, and activities. By showing the rapid and recent increase in investment in areas that were previously virtually untouched, we can demonstrate the urgency of the threats to these areas. To date, we have developed time-series maps of mining and timber concessions in the Guianas (Guyana, Suriname, and French Guiana) and oil concessions in the Petén region of northern Guatemala. We plan to complete more sets of time-series maps in the coming years.

Policy Briefs

Finally, to more widely disseminate these maps as well as to raise awareness on trends in natural resource extraction, we published a CI policy brief on the three extractive industries entitled *Natural Resource Extraction in the Latin American Tropics: A Recent Wave of Investment Poses New Challenges for Biodiversity Conservation*. The document presents a refined map of timber, oil and gas, and mining concessions in key Latin American conservation areas, as well as the time series of timber and mining in the Guianas and oil development in northern Guatemala. The text of the document includes broad introductions about trends in each of the three extractive industries and presents recommendations for conservationists and other stakeholders.

This policy brief was intended as a tool for use by NGOs, conservationists, local communities, development agencies, governments, and other stakeholders concerned with the future of conservation in Latin America. Although it offers several concrete recommendations for how to think about resource extraction and how to approach the threat, it is intended mainly to raise public awareness about these trends and to aid in the search for new solutions to address them.

Because the policy brief focuses on Latin America and may potentially be used by many small community and environmental groups, as well as national and local governments, we have commissioned a Spanish translation of the brief. We plan to print and distribute it in Spanish.

Impact

CI's tracking of the expansion of extractive industries into important biodiversity areas has been well-received by NGOs, governments, development agencies, media organizations, and other stakeholders that are trying to demonstrate the overlap of development and conservation priorities. A version of our map was presented to World Bank President James Wolfensohn and was reprinted in *The Washington Post*. The policy brief has been featured on National Public Radio and in *The Miami Herald* and several Latin American publications.

Having this information available increases our flexibility as a department and an organization, heightening our ability to respond quickly and effectively to emerging threats to conservation. An example is the recent creation of the Central Suriname Nature Reserve in Suriname.

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By Isaac Osuoka

Introduction

Environmental Rights Action (ERA) is a Nigerian environmental advocacy organization established in January 1993 by three human rights activists based in the Southern Nigerian town of Benin City. ERA is dedicated to the defense of people's rights to live within an environment conducive to their survival. Because people depend on the endowments of nature, any activity that threatens the integrity of the natural environment violates the basic right of people and communities to survival.

ERA was established in response to information from inhabitants of the nearby Okomu community that a French transnational rubber corporation planned to cut down parts of the Okomu forest reserve and convert it into a monoculture rubber plantation. This development threatened local populations dependent on the forest for their survival. It reflected a common trend of human rights violations in Southern Nigeria, where 75 percent of cases reported to human rights organizations are related to ecological degradation. In response, activists began working with communities like Okomu to monitor natural resource exploitation by the government and private companies.

Constraints on ERA's Effective Operation

Repressive Government Decrees. Many government officials see government service as a means to accumulate wealth. Decrees that encourage unsustainable use of natural resources are common. The regime considers advocates of environmental human rights as enemies and troublemakers, and it treats them accordingly.

Government Support of Polluter Activities. The central government is in partnership with transnational corporations in some environmentally damaging activities such as oil extraction. Government agencies responsible for the monitoring and regulation of environmental standards therefore lack the political will and resources to be effective. In addition, independent monitoring is discouraged by the government and its business partners—the oil and mining corporations.

Community Distrust of Outsiders. Lack of trust is often a problem when working with local communities. Residents who have been cheated by governments, companies, loggers, and others understandably do not always trust outsiders. Fortunately, ERA's experience is that building trust can occur quite quickly. ERA's use of indigenous volunteers who speak the language of the area being monitored helps aid communication and enhance the trust-building process.

Logistical Constraints. ERA workers are often hindered by transportation problems in remote forest and wetlands areas. In the Niger Delta area, most transportation is on water, but boat transportation is very expensive and irregular. This constraint, coupled with limited resources, can be crippling.

Lack of NGO Experience and Capacity. Some ERA monitors have limited technical knowledge and experience. Good training can ease this problem, but training all the monitors would be expensive.

Staffing Constraints. The large amount and frequency of information and data from the monitors sometimes becomes a problem. Project officers do not always have the time or the resources to respond to all the alerts. In addition, the relatively high frequency of publications such as field reports makes follow-up of all cases difficult because of the limited number of project officers and resources available. ERA project officers try to consider this a challenge instead of a burden.

Funding Constraints. In the past five years, funding for ERA activities has improved. ERA receives donations from organizations and individuals both within and outside the country. These donations are for specific ERA activities. However, it is difficult to raise money for monitoring because some funding organizations considered it an intangible activity. ERA will often link monitoring to other activities with clearer and sometimes predetermined outputs.

Organization

Mission

ERA formally describes its mission as "The defense of human ecosystems in terms of human rights, and the promotion of environmentally responsible government, commercial, community and individual practice in Nigeria through the empowerment of local people."

Objectives

ERA has a number of objectives related to the above mission and philosophy. The objective most closely related to monitoring is very straightforward: "Monitor natural resource exploitation by government and private companies."

The Monitoring Program

Monitoring: A Tool for Resistance

ERA feels that monitoring is an important means of achieving its goals. The task involves being on the alert to identify production activities or laws and policies that pose a threat to the integrity of the natural environment. When such activities or policies are identified, they are exposed to a public that include policymakers and commercial interests. Publicly revealing environmentally harmful activities is a means of pressuring policymakers and transgressors to stop the activity.

Monitoring strategies will not succeed if local communities are not actively involved in the processes. In addition to seeking to pressure government and industry to stop or reform particular development projects, we are working to transform the social reality that encourages the unsustainable exploitation of natural resources.

As logging, plantation development, and oil and gas extraction activities are mainly carried out in rural areas, the local populations have better on-the-ground knowledge of project activities. Their participation in monitoring makes the ERA process more effective. In addition, their participation in the process helps prepare local interests to engage in protest activities. Monitoring therefore becomes a tool for resisting environmental injustice.

Data Gathering

The process of monitoring primarily consists of volunteers and field officers receiving information on a proposed or existing activity with potentially damaging consequences to the natural environment and local populations. The monitors then alert the national coordinator, who in turn identifies and contacts relevant volunteers to visit the area in question.

Sources of ERA Data

During monitoring, ERA gathers data that expose threats to the natural environment and local populations. Such data include government legislation, policy statements, and corporate documents. Other data include photographs, videotapes, and maps, which may be obtained from relevant government departments and even from companies. However, the most important data ERA collects is from members of nearby communities.

Participatory Research. In conducting participatory research, ERA field officers try to immerse themselves in local life to understand the perspective of the people. Rural communities usually have a profound knowledge of their ecosystems. Tapping local knowledge is an important aim of participatory research.

Field Research. Field visits are meant to obtain a more or less general picture of the extractive activity and the existing or potential threat to the natural environment and local populations. Volunteers sent to do field research usually have some

knowledge of the local language spoken in the area as well as technical knowledge of the particular exploitation activity or the ecological dynamics of the affected area.

Documents and Other Data on Corporations or Government. Data are also collected from sources within the corporation or government agency responsible for the activity in question. Collection of such data in a country like Nigeria, where the state does not encourage openness, is difficult, but concerned sources within companies and government agencies are sometimes willing to make papers available.

Data Analysis and Synthesis

Data are synthesized by project officers to fit into the ERA format for reports for presentation to the public. This stage may involve relevant data from ERA's participatory research, fieldwork, government and corporate sources, the media, and previous publications of ERA and other research organizations. The format for ERA reports is designed to portray how degradation of the natural environment affects the condition of local populations.

Data Verification. A major responsibility of project officers is to verify the authenticity of information from the monitors and other sources. ERA backs up its claims whenever possible with documents and photographs. Names and descriptions of information sources are sometimes also documented if appropriate. This is usually the case with community sources, but if the source is a civil servant or industry employee whose position might be at risk if he or she is exposed as the source of information, we usually keep the identify private. Also, some sources of information would not like to be identified as such because of fear of reprisals from the military dictatorship.

ERA also encourages company or government agency reviews of their reports. ERA gives its information more credibility by allowing the government and corporations to respond to its allegations. If the information is inaccurate, the corporation has a chance to defend itself. If the information is correct, the company must admit it or implicitly admit its guilt by not responding. A transparent methodology allows ERA to back up its claims with honestly obtained information.

Communication

Audiences

The General Public. A component of the monitoring process is the communication of the data to the public. Such communications are intended to raise awareness and galvanize public opinion to pressure relevant authorities and force them to terminate or change an environmentally damaging project.

Media. Newspapers and radio stations are another ERA target. ERA issues press statements and releases its publications to the press, where they are frequently cited in stories on the environment. ERA organizes press conferences to address particularly serious issues.

The international media are also part of the ERA audience. Most of the time, ERA information is given to the international press by one of several organizations in other countries that regularly receive ERA information via e-mail. These organizations are mostly European and North American groups involved in campaigns against environmental injustice.

International NGOs. ERA benefits from the solidarity of partner organizations. These international NGOs are an important means through which ERA gets its information distributed internationally.

Government. Various levels of Nigeria's government are also a prime target of ERA communications. Government officials have rarely responded except to harass ERA staff. However, ERA continues to share its publications with government.

Communication Products

Monitor Reports. ERA monitor reports, which are the organization's major reports, highlight information gathered from

intensive monitoring campaigns. Monitor reports contain ERA's analyses of the causes of ecological problems. These causes include methods and technologies used by unsustainable development activities and the legal framework governing such activities.

Field Reports. ERA field reports are compiled from the monitoring fieldtrips by project officers. They are mostly follow-ups or updates to activities highlighted in monitor reports, but they may contain fresh data on an ecologically threatening activity.

Environmental Testimonies. Environmental testimonies consist of interviews with local residents about environmentally damaging activities. They are recorded and presented without alterations. The goal is to highlight the plight of the victims of ecological damage. Environmental testimonies are obtained by project officers and monitors through taped interviews with community leaders whose names are published as testifying to the revelations that ERA makes in its field reports. For example, ERA's monitoring of a Mobil Corp. oil spill that devastated the entire coastline of Nigeria resulted in environmental testimony demonstrating that clean-up claims by the company were fraudulent.

Action Alerts. Action alerts call for local and international actions against environmentally destructive projects. They are issued through mass distributions of leaflets and published in local newspapers. Action alerts were issued against Michelin in 1994 when the tire company planned to cut down the Okomu forest reserve to establish rubber tree plantations.

Niger Delta Alert. The Niger Delta Alert is published monthly by the Delta Information Service of ERA. It highlights oil industry and logging activities, which cause damage to the mangroves and rainforests, as well as human rights abuses against members of local communities. Niger Delta Alerts are printed on paper for local distribution and are also distributed to organizations around the world via e-mail.

React Program. ERA has designed the React Programs to promote the twin objective of ecological monitoring and community empowerment. The React Program involves conducting open forums in villages in which members of the community and ERA representatives discuss perceptions of the natural environment. In these forums, local people express what they consider to be environmental problems. Such forums support and strengthen traditional community institutions relevant to monitoring and regulating of forest exploitation.

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by Roberto Smeraldi[1]

INTRODUCTION

This paper describes how the Friends of the Earth–Amazônia Program (FOE-AP) developed a five-year process to monitor illegal logging and timber trade in the Brazilian Amazon. The monitoring has been instrumental in fostering a better understanding of the problems affecting the timber sector, the need for forest conservation, and the conditions for sustainable development in Brazil.

FOE-AP began in 1989 as a small unit within the Friends of the Earth International network. The program was started after some European Friends of the Earth groups had conducted campaigns relating to the Brazilian Amazon, including opposing the Xingu dams, World Bank loans for other projects, and the creation of extractive reserves. These groups became convinced that a local chapter in Brazil was needed. Since 1989, FOE-AP has progressively changed from a unit of an international NGO to an active Brazilian NGO. It was legally incorporated in Brazil in 1993.

ORGANIZATION

The Mission

Friends of the Earth International is a worldwide federation of national environmental organizations. This federation aims to:

- Protect the Earth against further deterioration and restore past damage;
- Preserve the Earth's ecological, cultural, and ethnic diversity;
- Increase public participation and democratic decision making;
- Achieve social, economic, and political justice, as well as equal access to resources and opportunities; and
- Promote environmentally sustainable development at the local, national, regional, and global levels.

Objectives

In 1993, FOE-AP decided to focus on monitoring the occurrence, magnitude, dynamics, and regional distribution of illegal logging activities. Logging was rapidly replacing agro-ranching as the driving force behind the expansion of the colonization frontier. Given that trend, it was clear that FOE-AP should focus on logging.

At the time, most existing campaigns and initiatives by environmental groups focused on urging governments to take stricter measures to limit or ban logging, or to restrict trade in timber products (or both). But FOE-AP felt that this regulatory approach was misguided. Strengthening the legal apparatus without improving its implementation was creating an even larger gap between the law and the reality. Instead, FOE-AP would use monitoring to show the extent of illegal logging and thus bring pressure to bear on the government to uphold the laws.

THE MONITORING PROGRAM

The Monitoring Strategy

FOE-AP believes that the most powerful monitoring strategy is a combination of field monitoring and legal research. These aspects of monitoring should always be combined in order to discover the unex-

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pected mechanisms that permit illegal resource extraction.

The organization applies this strategy by building a thorough knowledge of existing legislation and rules, as well as previous judicial decisions, before deciding on its field monitoring activities. This is especially relevant when analyzing management plans and government authorization of them, because illegal logging is often made possible by loopholes in the law or the misuse of official licenses.

Developing the Monitoring Plan

In planning the illegal logging and timber trade monitoring campaign, a very pragmatic, factual, case-by-case approach was used. FOE-AP avoided relying on a predetermined methodology, which might have influenced the scope of the research. The organization instead started with the assumption that all groups involved in the timber trade should be heard from in order to fine-tune the scope and direction of the investigation. The ensuing discussions included representatives from environmental, social, labor, and human rights groups**,** as well as both private and public individuals and organizations.

This was an important learning process for FOE-AP. Listening to the views of all involved sectors, including those who were carrying out the illegal activities, was crucial to understanding the mentality and rationale behind the environmentally harmful practices. This helped narrow the scope of the research, establish priorities, and improved interpretation of the results.

The best way to conduct the investigation was to use field observations to check the information provided by federal sources in Brasilia. Demonstrating the inconsistencies between the official information and the reality on the ground was a key method of exposing the illegal practices.

FOE-AP had no official plan. We needed to be flexible and learn as the program proceeded, particularly since there were many differences among the nine states in the Brazilian Amazon as well as internal differences within the states. Had we established a fixed procedure, we might have been less receptive to analyzing certain local information that was incomplete or did not include the needed background. Some less-than-perfect information proved to be important.

Data Collection

Government Data

The Brazilian constitution establishes generic rules on transparency in public administration. However, there are no specific "freedom of information" regulations requiring the release of information. In FOE-AP's experience, different government bodies could be either forthcoming or secretive. Even the same organizations switched their attitudes, depending on the situation. Their responses were rarely based on legal obligations, but instead on their understanding of how the information request could help or hurt them.

A good example of FOE-AP's relations with government and its ability to obtain pertinent government information can be seen in the interactions between FOE-AP and IBAMA, the official federal environmental agency. At the beginning of the illegal logging and timber trade monitoring project, IBAMA was very helpful due to its hope that FOE-AP's research would contribute to a higher profile for their own work. Over time, however, relations between FOE-AP and IBAMA worsened until, in 1997, IBAMA abruptly stopped releasing any relevant information due to a gradual deterioration in the relationships between the director of IBAMA and most major environmental organizations.

Field Data

We used planes to fly over critical areas to check on certain things, such as whether management practices were really conducted or if logs were transported along a certain trail. Pictures were taken in order to document such things as environmental damage or the movement of logs toward a sawmill.

Interviews

Interviews at sawmills were conducted by our colleagues from Imazon, a partner organization based in Belém. They were not part of the investigation of illegal logging, but focused on the identification and description of trade flows in order to describe domestic consumption. FOE-AP contributed to this work with some local collaborators and helped with the analysis.

The interviews relied on standard questions that were tailored to four different categories of sawmills (based on size). Specific questions were added based on characteristics of particular areas (the whole Amazon was divided into 74 main "timber poles").

Due to the absence of any reliable figures on domestic consumption, 1,370 field interviews were conducted with employees at sawmills and local people living nearby. This process gave a reliable picture of the timber flows from the producing areas in nine Amazon states to the highest consuming states, which are mostly in southern Brazil.

In conducting interviews and using information from informants, we had to consider the safety of those who assisted us. In most cases, local people who provided FOE-AP with information could be threatened and suffer various forms of retaliation. This was a problem even if they were not directly quoted; the simple fact that "somebody" spread information was sufficient reason for intimidation. In some cases, the circulation of confidential information could be enough to identify the source. Therefore, FOE-AP often needed to create artificial situations to explain how some information was obtained without compromising or jeopardizing the source.

FOE-AP found that hiring reliable investigative journalists could be a cost-effective way to quickly get some information for a project. The use of journalists also had other benefits like improving media outreach. For example, this technique often led to exclusive articles that stimulated interest in our reports.

Data Analysis

The initial data were checked against all possible existing sources of information. Usually, these sources were related only to a specific subregion or timber species, but they were useful for detecting possible distortions or inconsistencies. Such existing sources included studies, official reports, trade statistics from public institutions, industry information, and other analyses.

It is important to look deeply into the information you are monitoring. For instance, FOE-AP was surprised to discover that IBAMA guards in certain areas issued a large number of fines. This might have led us to either conclude that enforcement activities were more effective in those areas or that illegal activities were more concentrated there. However, through further investigation we were able to verify that the transgressors used complex legal loopholes and actually paid less than 6 percent of the fines. FOE-AP concluded that informal agreements are often made between loggers and guards in these areas so that the former can continue their illegal activities and the latter can show they are active in enforcement.

Communications

The main targets of FOE-AP's communications strategy are the government, local and international NGOs, local and international corporations, Brazilian and international media, and Brazil's civil society, including the very isolated villages deep in the Amazon. To reach these different groups, FOE-AP has adopted numerous communications tools.

In addition to issuing reports, the organization releases information to the media through both verbal communications and e-mail, engages in direct dialogue with the Brazilian government, and maintains a radio network that broadcasts into remote areas of the Amazon.

Advance Briefings to the Media and E-mail Releases

Usually, just sending a news release is not a good way to obtain good coverage. It is much better to strike an agreement with a specific journalist that you will provide exclusive information and organize an advance briefing session in which you explain all the details. The reporter will write a more accurate article, probably getting more space in the newspaper. The journalist also becomes a kind of specialist who, in the future, will be more likely to follow up with other articles. In addition to this traditional method of reaching audiences, FOE-AP periodically sends releases to electronic mail lists. The lists include media and other interested parties.

Judicial Action

FOE-AP increasingly believes that judicial action may be an effective way to achieve its mission. This has not yet begun in earnest, but as individuals, corporations, and government agencies have shown themselves to be unwilling to uphold Brazilian law, taking them to court is one of the best remaining options to force the issue. This is a strategy that environmentalists have used successfully in many countries.

Radio Amazônia

Radio Amazônia is a project aimed at providing radio communication for isolated forest dwellers. This is important for several reasons. It provides valuable information to FOE-AP regarding illegal logging in very remote areas of the forest, where information is extremely hard to obtain. The communication also gives the communities information that supports sustainable development. It does this by providing ideas for dealing with incursions by loggers and other threats to their areas and their traditional means of livelihood. In addition, radio is a source of education about appropriate development of local areas.

GLOBAL WITNESS: A U.K. NGO FOCUSING ON CAMBODIA

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Written by Christian Ottke, based on an interview with Patrick Alley

Introduction

Global Witness is a British group based in London and founded in 1993. It is a small organization that specializes in investigative monitoring, primarily in Cambodia. Global Witness's main concern is breaking the link between the exploitation of natural resources and the continuation of wars and other social unrest. In particular, it wants to stop the theft of forest resources by armies in Cambodia.

Global Witness was founded by three individuals who had worked for the Environmental Investigation Agency, which developed many of the investigative monitoring techniques Global Witness employs. Global Witness has remained small, with a total of six employees in 1998, supplemented by volunteers both in London and in the countries where it conducts its monitoring activities.

Organization

Mission

The mission of Global Witness is to break the link between the exploitation of natural resources and the continuation of wars and other social unrest.

Objective

Global Witness was founded on the concept that solid information is a powerful tool that can lead to dramatic results. Its main objective is to gather and effectively disseminate incontestable information regarding illegal resource exploitation and to use this information to lobby for positive change.

Maintaining Staff Safety

Because of the issues and the areas where they work, the people who conduct Global Witness's monitoring programs can face dangers. In countries where Global Witness works, they prefer to visit every relevant province so that they learn the situation firsthand. To minimize risk, they assess the situation by talking to local people, nongovernmental organizations (NGOs), and embassies. If the situation in an area they had planned to visit is too dangerous, they cancel the trip. While in the capital of a country, they minimize the danger by meeting with ministers and army officials and making their presence widely known. Any incident would thus become an internationally embarrassing event. In the provinces, however, Global Witness does not make its presence widely known. As there are few people in the countryside, recognition is easy and word travels fast. It would be difficult for the monitors to get information if everyone knew that Global Witness was around.

In regard to personal safety, Global Witness is especially concerned about the Khmer or Thai people who give them information or work with them. Local people unfortunately are at greater risk of violence than foreigners. Global Witness encourages and needs contacts but advises people to remain low-key. In the past, local people wishing to leak information to Global Witness have come directly to the monitors' hotels without thought that there might be danger involved. Now Global Witness actively discourages any open interactions other than those dictated by basic daily life. Similarly, the organization's local collaborators won't be sent into any dangerous areas or to do any of the more dangerous data collection.

This concern has led to a difference in the type of work that the London–based staff and their local Thai or Cambodian counterparts are assigned. Although local people in some situations were inconspicuous and therefore able to obtain information with much greater ease and effectiveness, at other times their efforts placed them in physical danger. Foreigners have a comparative advantage getting information in some

situations, and they are almost always in less danger due to their status as foreigners.

Obtaining Funding

Global Witness has received most of its funding from development NGOs working within Cambodia. Because Global Witness investigates the links between resource exploitation and continuing social and economic problems, NGOs concerned with both social and resource issues are willing to fund its efforts. Most donors prefer to remain anonymous because Global Witness is controversial.

The Monitoring Program

Project Planning

Secondary source research. As discussed in the data collection section, Global Witness conducts extensive secondary source research prior to going to Cambodia. This gives it the ability to plan based on timber sales records and news accounts.

Global Witness reviews historical data to identify where most activities typically take place. These data usually illustrate a pattern of events. For example, the organization hears rumors that logging trucks are being moved to a certain location near the Vietnamese border, or that a big logging contract has been awarded from the Cambodian government, or that cutting has taken place in a certain location. Global Witness then uses these clues to put all the information together and focus its investigation on a key issue or area. While the field investigation is being conducted, the search to obtain documents from existing or new sources continues.

Global Witness' monitoring plans. The monitoring plans depend to a certain extent on seasonal constraints, because logs can move only by land in the dry season and by river in the wet season, and because access is difficult for the loggers in the wet season. Another important factor is the timing of national and international events (for example, Association of Southeast Asian Nations (ASEAN) meetings and national elections). This is important because Global Witness usually publishes a report after an investigation, and the release is timed to have the greatest impact.

Fieldwork. The investigators "hit the ground running." They visit the provinces incognito and are extremely reactive to what they see and hear. This part of the process is necessarily ad hoc. The investigators never know what they will find on the ground. In every case, Global Witness assesses whether its own staff or local contacts should make the visit.

Choosing specific areas. Global Witness finds it is worthwhile to focus on specific areas. A small organization cannot do everything at once. In 1995-96, the Thai-Khmer Rouge trade was a major focus. But Global Witness also worked on exposing illegal logging sanctioned by the Royal Cambodian Government, making this activity a major donor concern. In 1997, Thailand became a lower priority while Global Witness focused on the Royal Cambodian Government. In late 1997 and early 1998,Vietnam became a major focus.

Data Gathering

Global Witness gets its data from a variety of sources using two main methods: paper-based research and investigative field research. An important aspect of Global Witness' monitoring is its investigative approach. Monitoring illegal trade between guerilla armies and corrupt governments is by nature a potentially dangerous undertaking. This has forced Global Witness to adopt specific methodologies to conduct monitoring safely and effectively despite the hostile circumstances.

Paper-based Research

Global Witness begins its process of data gathering in London. It undertakes an extensive process of looking through official trade statistics and talking with journalists, NGOs, donor agencies, and other sources. After arriving in the country of concern, the investigators repeat the process, and also talk with government officials. This process gives them a good sense of what is going on. Based on this knowledge, they then go into the areas

where they expect to find illegal logging they can document.

Investigative Field Research

Global Witness' fieldwork encompasses numerous aspects. These include interviews, receiving leaked documents, recording Global Positioning System (GPS) coordinates, taking photographs and video footage, and simply observing and recording information. The strategy upon beginning a monitoring campaign in the field is to find any evidence of illegal logging and to record it.

Data gathering upon arrival in Cambodia begins in the capital city. Monitors announce their arrival, set up meetings with ministers, hope that people will supply them with government documents, and try to obtain information from other NGOs. When the monitors head into the field, their activities become quite broad because this is where most of Global Witness's information is gathered. Sometimes the monitors feel the need to go undercover, but often they do not. When they go undercover, they generally pretend to be "in the business" — either journalists or researchers. Whether they are working undercover or openly, their monitoring activities are often quite similar. They record GPS coordinates, take video and still photographs, seek documentation that people are willing to give them, and take personal testimony — although they require that the same story be confirmed by three people before it is considered valid. The GPS information has proven invaluable in backing up Global Witness's statements, since their audience can use the coordinates to locate precisely where the logging has taken place.

The Global Witness monitors also gather data by other means, such as counting trucks. This involves sitting by the road counting trucks for a number of hours or a day, asking local residents how many trucks go by and asking truck drivers how many other trucks they know about. This process gives monitors a way of cross-checking their estimates with confirmed figures. It is worth noting that truck drivers' information can often be more valuable than the information provided by a company boss. The drivers know exactly where they go, how often they go there, and what and how much they carry — and they usually talk freely. A company doesn't buy much loyalty at a few dollars per month.

An interesting aspect of Global Witness monitoring is that it doesn't have to be secretive nearly as often as one might expect. Not only can the monitors often videotape or photograph openly, because local people generally don't mind the taking of photographs, but the monitors can often be very free and obvious even in the middle of an illegal logging camp or headquarters. In fact, the organization generally considers it safer and more effective to keep a high profile.

For a long time the monitors would act obtuse, trying not to call attention to themselves as they quietly traveled about recording information. In contrast, they now announce their presence through the press and meet openly with government ministers and NGOs. If anything were to happen to them, the government would receive some of the blame and the event would become a large international event. By being obvious, the monitors also advertise their presence to people who would like to leak documents to them.

The monitors use a different type of directness when they are undercover, pretending to be journalists or representatives of a timber company. Instead of hanging around near a logging camp and first assessing the situation, which can arouse suspicions, they have found it to be more effective to boldly drive up to the chief person's building, get out, hand over a card, and begin a conversation. This keeps the interviewee from becoming suspicious and can often give Global Witness access to a whole region if the chief administrator gives the monitors his blessing. Recognition of the local culture's enjoyment of conversation has been instrumental in this aspect. Global Witness gleans large amounts of information in the course of enjoyable conversation.

Communication

Global Witness has evolved over time from being just an information gathering organization to being an expert in the field. Its advice is sought and offered on various issues. Global Witness tries to avoid imposing Western ideas on sovereign nations but instead, in the case of Cambodia, simply points out the country's legislation and how the actions of various people contravene it.

Global Witness's communications strategy is broadening. The organization formerly focused on communicating its findings to decision makers and those who influenced them: politicians, donors, NGOs, and the press. Global Witness felt that the relatively low level of government accountability in Cambodia demanded that it focus on "quick hits" rather than broad awareness building. This situation has been changing, however, and Global Witness now is including the broader public in its communication strategy to a greater extent. Global Witness published its March 1998 report in Khmer as well as English and distributed it widely in Cambodia. It is the first time such detailed information has been available to Cambodian politicians, NGOs, government officials, journalists, and the public in their own language. There was strong demand for the report and much local cooperation among NGOs. After the election, the Cambodian People's Party stated that the Global Witness Khmer report had hurt its popularity and contributed to its electoral loss in the heavily logged Kratie province. In general, public awareness is growing and is crucial to swaying the actions of the leaders.

As good information is its main strength, Global Witness jealously guards its reputation for providing only accurate information. The organization never sensationalizes or exaggerates. Global Witness prefers to let the facts speak for themselves. It believes that it is better to publish an easily defensible underestimate than an estimate that is probably more accurate but lacks complete supporting data. For example, a recently published Global Witness estimate of the illegal Cambodian timber harvest was considered too low by the organization, but it was one it could defend. The World Bank later published a number that was twice that of Global Witness's. Regardless, Global Witness was happy to have published a number based on data that it had and could defend.

Global Witness has found proof of high-level involvement in illegal logging operations by obtaining documents with the signatures of high government officials, and by videotaping interviews with loggers who name them. Such documents are irrefutable and invaluable. There is no one strategy to getting them; rather, the monitors have to be lucky. The documents come from mid- to senior-level officials who are disgusted with the actions of their leadership. If they cannot use the documents themselves because it would be too dangerous, and they trust the monitor not to reveal the source, then they may leak them. Sometimes the monitor's best policy is simply to ask outright for the documents. This sometimes works.

Relations with Government

Global Witness also recognizes that in the geographic area where it is working, much if not most change comes about as the result of prodding by a foreign political entity during bilateral talks, rather than through strident criticism by activists. It therefore focuses on exposing government wrongdoing to the media, NGOs, and foreign governments, while accepting that the problem may not be addressed by the government of the country of concern until there is additional prodding by another government entity or a major funding organization. This recognition keeps Global Witness from feeling the need to become too strident in its demands for change.

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By Keith Alger, Gustavo A. B. Fonseca, John Reid, and Rui Rocha

Introduction

At the beginning of the 1990s, conservationists urgently wanted to know why deforestation was still occurring in the last forest patches in Brazil's Southern Bahia, a world-renowned center of endemism in the mostly decimated Atlantic Coastal Rainforest. In 1990, the Biodiversitas Foundation, a Brazilian NGO, together with the World Wildlife Fund (WWF), Conservation International (CI), and Wildlife Preservation Trust International (WPTI), purchased and donated a key piece of land to consolidate the Una Biological Reserve, the only area protected for fauna in Southern Bahia. It was clear, however, that if the surrounding forest on private lands were destroyed, the Una Reserve's 7,000 hectares would not guarantee the survival of the golden-headed lion tamarin, the area's key charismatic species. Thousands of other endemic species would also be in danger. About 95 percent of the land in the area surrounding the Una Biological Reserve was already deforested, and logging and pasture clearing was accelerating.

Conservationists were interested in whether they could successfully protect Southern Bahia's last private forests, and its hundreds of dependent species, through landholder cooperation instead of purchasing land or resorting to zoo management.

A Profile of Environmental NGOs

Brazilians in general, and especially those in rural areas and interior towns, have little experience with nongovernmental public interest associations. When civil rights were established in the 1980s, thousands of new organizations bloomed. However, meager individual and corporate philanthropy has left most of the over 1,000 existing Brazilian environmental NGOs insufficiently funded and unable to attract paid professional staff (Mater Natura/WWF 1996).

Most environmental NGOs consist of a handful of activists working to raise local consciousness about environmental problems. They use three main strategies:

- **Denounce government malfeasance.** This approach is relatively inexpensive and can demonstrate power by driving someone from office.
- **Conduct environmental surveys.** Surveys are usually done under contract with state and local governments. This approach is not intended to achieve policy impact.
- **Provide independent public interest advocacy based on scientific and technical research.** This approach was probably first exemplified by organizations such as the Brazilian Foundation for Nature Conservation (FBCN), Assistance and Services for Alternative Agriculture Projects (ASPTA), and the Federation of Organizations for Social and Educational Assistance (FASE).

Finding a solution to the deforestation problem surrounding the Una Reserve required a coordinated analysis by biologists, economists, foresters, agronomists, and lawyers. These analyses could be used for coordinated advocacy and conservation of the most private land at the least cost. Because governments and universities in Brazil failed to take this approach, a small number of research and public interest NGOs had to step in. In addition to conducting the research, these NGOs are also capable of implementing demonstration field projects. The principal examples of this type of organization in Brazil are Biodiversitas, IMAZON (Institute for Man and the Environment in the Amazon), PESACRE (Agroforestry Research and Extension for Acre), ISA (The Sócio-Environmental Institute), and IESB (Institute for Social and Environmental

Studies of Southern Bahia).

Intervention And Monitoring

The goal of IESB and other NGOs was to encourage landholders near the reserve to institute forest conservation measures. Achieving this goal required research, public policy, and demonstration components. The research showed that Southern Bahia's economy was changing from a single-product economy based on cocoa to a mixed economy of diversified agriculture and tourism. It was therefore clear that the conservation strategy would have to include players other than the cocoa farmers (Alger 1998; Hardner 1996). The project chose instead to demonstrate that farmers can stabilize their income by intercropping tree species, and that forest-related ecotourism attractions can boost the value of forest remnants.

In many situations, basic data about an issue to be monitored were poor. In these cases, NGOs had to conduct basic scientific research to clarify policy issues. However, the NGOs were careful to institute research goals and methodologies that were constant over time and did not change with the comings and goings of research staff.

It should be noted that a flexible strategy for biodiversity conservation can work only if attention is focused on the ends instead of the means. Although improving agriculture and tourism may be a means to conservation, fixation on these tools can become an organization's identity, thereby reducing its effectiveness. Periodically reviewing the history and economic conditions that cause the threats to biodiversity can help a team stay focused on the ends (Dean 1995). Funding sources should also be scrutinized to ensure that they are not inhibiting the NGO from reaching its goals.

When Successful Monitoring Means Ignoring Your Progress Indicators

One of the best examples of flexibility and peripheral vision is the nearly 180-degree strategy shift taken in Una when the creation of a new public conservation unit became a real possibility in 1996. As outlined above, tourism policy was key to the existing strategy for Una. Research had shown that tourism was a comparatively benevolent economic alternative for the region's biodiversity. But this depended on whether government policies helped elevate the value of forested landscapes as a part of tourism development policy. While monitoring the state government's tourism policies, however, CI and IESB discovered that one of the state's key priorities was a road construction project opening up the forested coastline from Ilhéus to Itacaré. In glossy presentations, state tourism officials spoke of attracting Caribbean-resort style hotels to this region.

A complex set of political and institutional factors confronted the CI/IESB team (Reid 1998). Municipal elections were coming up and the road enjoyed strong local support. The state government's plan was part of an elaborate regional development scheme backed by the Brazilian government and the Inter-American Development Bank (IDB). Only one local environmental group, the Black Dolphin, had openly criticized the road plan. Politics aside, there was a fairly solid economic rationale for the road. Pavement was needed to draw tourists in passenger cars into a region whose stunning beauty and beaches made tourism a logical economic development choice.

At first the CI/IESB team merely alerted state officials and the IDB of the biological resources at risk in the region, and received assurances that a proper environmental impact assessment was being prepared. Next, the team consulted IDB documents and experts to see, in the likely event the road could not be stopped, what might constitute a credible plan to avoid or mitigate its environmental impacts. Those inquiries indicated the need to counter the deforestation potential of the road directly by protecting what was left of the forest in an official reserve.

The finished environmental impact assessment made no reference to the threat to habitat, focusing instead on the typical set of direct impacts of moving around large quantities of dirt and rock. It made no

mention of the forest through which the road would pass, which was found by a group of scientists in 1993 to have the highest per-hectare diversity of plant species on Earth, with a dozen species new to science (Thomas et al. 1998). The NGO team began the task of selling the idea of a road and a park to the state, the IDB, local mayors, and environmentalists like those at the Black Dolphin. The IDB's environmental officer visited the area, criticized the quality of the environmental impact assessment, and seconded the park as a condition of approving the road funding. Within the state government, a newly formed and active forestry agency, which would oversee any park created, stepped in and also backed the idea. Local environmental activists endorsed the plan as well, after realizing the inevitability of the road and the small window of opportunity to acquire and protect the surrounding forest.

That combination of supporters was sufficient to overcome reluctance in other quarters of IDB and impatience within the state road-building agency. While the IDB proceeded to shuffle funds to enable purchase of the land, the state forestry director set to work to win the governor's approval. The CI/IESB team carried out mapping and technical design tasks for the new park. When the state needed interpreted satellite images to show the forest's location in relation to the road and other state conservation units in the region, the NGOs were able to supply these rapidly. The state's forestry director found allies in the state's tourism sector that helped convince the road department that the NGO involvement was not obstructionist. Early in 1997, the governor of Bahia announced the creation of Serra do Conduru State Park and construction of the road began.

This experience highlighted an unexpected gap in the conservation strategy that had been developed for Una. The strategy had not anticipated that the creation of new protected areas could be politically popular. Once the government realized that the IDB would offer more funding to the road project to make the park a reality, biodiversity conservation was seen as a positive complement to its tourism development plan. NGOs that were famous for obstructing development became the champions of the government's plan. Famous conservationists and their organizations went on record acknowledging the environmental leadership of Bahia, bringing international prestige to a state hungry for this recognition. Suddenly, NGO cooperation with the state government to slow logging and forest conversion around Una began to show progress. In 1997, the Bahian state environmental agency (CRA) supported NGOs in a successful petition to suspend out-of-control logging around Una.

We should recognize that the creation of the Conduru State Park did not directly augment habitat for the golden-headed lion tamarin, and it did not invalidate the strategy to promote conservation on private lands near the Una reserve. Though scientists have no explanation, the historical record shows no evidence of golden-headed lion tamarins in the Conduru forests that are only 60 kilometers from the Una Biological Reserve (Pinto and Tavares 1994). The strategy of hitching a ride on government tourism policy in order to gain a protected area increased the chances for survival of hundreds of species. It built confidence in the potential for future cooperation between the government and NGOs, but did not otherwise contribute to the survival of golden-headed lion tamarins.

The spirit of cooperation reached a high level, but some precautions were still necessary. Though the state proposed to hire the NGO's chief proponent of the Conduru Park as its manager, this offer was turned down. It was important to assign full credit and responsibility to the state for the creation and the consolidation of the park, and communicate clearly that the NGO role is to facilitate and monitor progress. Without creating rivalry or antagonism, it is important that the state know that NGOs cannot do their job if they are subsumed into the bureaucracy. If the state co-opted the NGOs to run the park, the government could attribute glitches to their participation, while the NGOs would have neither the authority nor the IDB funding to make the park a reality. Instead, CI/IESB facilitated the hiring of a park manager. Even though the state was undergoing a hiring freeze,

DDF, the Bahian forestry agency, signed a contract with CI-Brazil for management assistance, which CI-Brazil uses to pay park managers who are subordinates of DDF.

Conclusion

The experience related here demonstrates how the shortest distance between two points may not be a straight line. Monitoring the potentially benevolent effects of government tourism policy was part of a strategy, which included estimates of the number of hectares of private forest in Una that might be leveraged from this policy. But the potential for a new *public* conservation unit might have been overlooked if attention had been exclusively focused on these indicators. If, on the other hand, monitoring had been conceived as confronting badly designed state infrastructure projects, the resulting state-NGO conflict might have yielded no conservation benefits. Because of the cross-disciplinary research underlying the original strategy, which identified tourism policy as a potential partner in conservation, and the organization of cross-disciplinary teams encouraged to maintain their "peripheral vision" with respect to objectives, this opportunity was not lost.

For local NGOs with no baseline data, limited operating resources, and few adequately trained professionals, the best way to initiate biodiversity monitoring is to encourage rigorous ecological studies involving advanced students from the region that specifically address conservation policy. Finally, conservation organizations should not forget that protected areas in themselves can be a contribution to social and economic development, and that governments are willing to be proud sponsors of these and other NGO objectives when they can add resources and prestige to economically justifiable development projects.

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By Christian Ottke, based on an interview with Kris Wood

Introduction

The Pou d'Agouti (a local word for chiggers) is a French Guianese environmental protection NGO founded in 1990 to promote sound and sustainable resource development in French Guiana and the Guiana Shield region as a whole. One of its earliest campaigns was to fiercely criticize France's decision to build a large hydroelectric dam on the Sinnamary River at Petit Saut. Other dams were planned on the Mana, Oyapok, and Approuague rivers. In 1997, EDF, the French electricity company, officially declared it would build no more large dams in the province. In 1994, opposition to the construction of a road to the east, linking the province to Brazil, resulted in the withdrawal of European Union financing for the project. Later in 1994, the Pou d' Agouti met with regional NGOs from Suriname and Guyana to discuss the environmental situation in the Guiana shield area and strategies to influence it. This meeting led to the creation of the "Itiulu" network and the beginning of the organizations' monitoring activities.

In 1995, the Pou d'Agouti worked closely with other groups in Suriname and on the Maroni River in order to thwart Southeast Asian timber concerns, which were moving into neighboring Suriname. In 1996, the Pou d'Agouti's outspoken criticism of the inadequate design a proposed national park in the south of the country was one of the factors that caused this project to be overhauled. In 1997, the organization received a grant from the French Ministry of Agriculture to study the problems associated with the protected White Sands Forest area, which was threatened by illegal human occupation. In 1998, the International Fund for Animal Welfare (IFAW) provided funds for a continuation of the White Sands Project and World Conservation Union (IUCN)–Netherlands Committee agreed to finance a study of the social and economic impacts of a road to be built to the south of the province. In July 1998, a group of members purchased the building that houses the offices of the Pou d'Agouti, preparing the organization for continued activity into the 21st century.

Political Climate

The situation for the Pou d'Agouti is unusual among developing areas because French Guiana is an overseas province of France. This has led to a different political and economic climate than many other countries in the vicinity. Among these differences are high salaries and a long tradition of respect for an open political process. The high salaries have lowered the profit margin of logging in French Guiana, causing most timber companies to focus their interest elsewhere. The forests of French Guiana, therefore, have been under comparatively low threat. This economic situation, along with the open political climate that allows the Pou d'Agouti and other NGOs to participate effectively in the political debate, has slowed the pace of forest development.

French Guiana is a relatively stable democracy. As an overseas province of France, French Guiana has a multiparty political process and a free society. The province is liberally showered with development funds, in part because it contains the launching base for the European Space Agency's Ariane satellites.

Although the government does not openly oppose dissent, some people who previously worked for the government and provided environmental organizations with information damaging to the government

suspect that they lost either their jobs or the prospects of promotion as a result of the leaks.

Organization

Mission

Le Pou d'Agouti's mission is to promote debate on the development process, to promote sound and sustainable resource development, and to instill an ecological ethic in the people of French Guiana. Monitoring is not the Pou d'Agouti's primary mission, but it is a tool to provide information that supports its broader activities.

Changes in the Focus of the Pou d'Agouti

Le Pou d'Agouti has become more dedicated and consistently professional over the course of its eight years. For much of that time, Pou d'Agouti employees would conduct ecotourism trips into French Guiana's interior forests as both an environmental education effort and a means to earn money for the organization. A series of meetings and changes over time led to a shift away from the ecotourism trips.

The vast majority of the organization's time now is spent on advocacy and monitoring activities. This was made official in 1994 with the decision to include monitoring among Pou d'Agouti's activities. Large-scale logging had not been a major factor in French Guiana. In the neighboring countries of Guyana and Surinam, however, such transgressions were much more apparent. In response to increased threats against the forests in all three countries, environmental, indigenous, and human rights NGOs representing the three countries held a meeting at Paramaribo, Suriname sponsored by the World Rainforest Movement. The Pou d'Agouti came away from this meeting recognizing the need to track and disseminate information about forest and mining activities in French Guiana, especially on the Maroni River on the border with Suriname.

Networks

As the environmental movement has grown, the government has selected politically moderate NGOs for inclusion on committees and other bodies. In response, the major environmental NGOs in French Guiana have gotten together to form a federation. The federation has been selected to represent the NGOs, thus ensuring the Pou d'Agouti and other NGOs access to government information presented in the meetings.

International networks have also been important to the Pou d'Agouti's development. Conservation International and World Wide Fund for Nature (WWF) have helped build greater awareness within the Pou d'Agouti of the organization's competency and mission. An onsite adviser from the World Rainforest Movement-Forest People's Programme has greatly helped the Pou d'Agouti in its planning process. Representatives from these organizations come to meet with the Pou d'Agouti periodically in order to discuss strategies and ways to help strengthen and focus activities. With these representatives, the Pou d'Agouti has developed its communications through the Internet and made contact with numerous international NGOs concerned with the Guianas.

The Importance of Seniority

The competency of the Pou d'Agouti is also linked to its eight-plus years of existence, which provides it with some historical perspective about the situation in French Guiana. As early as 1991, the Pou d'Agouti applied for membership on the Commission of Sites, a body of experts that reviews all proposals concerning major landscape and planning changes, protected sites and buildings, and nature reserves. French law assures representation by "Environmental Protection Associations" on such bodies. In the early nineties, there was no real environmental movement in French Guiana; the Pou d'Agouti was therefore a vital representative on this body.

Presence on such bodies gives the Pou d'Agouti access to documents long before

their public viewing. The group disseminates this information to those who can provide an informed criticism of the proposals.

Funding

The Pou d'Agouti has been successful in winning grants. In 1991, WWF gave it a $10,000 grant, which it used to purchase office equipment. Its Nature Center was largely financed by the Ushuaia Foundation (now Foundation Nicolas Hulot) and is now run as a separate organization. Likewise its Wild Bird Recovery Center received $10,000 funding from the Animal Assistance Foundation in 1996. Regular small grants from the Ministry of Youth and Sports and the Ministry of the Environment help pay for events during National Environment Week, Earth Day, and other significant dates. More recently, the organization received an $8,000 grant in 1997 from the Ministry of Environment to fund the purchase of new computers for its magazine. Also in 1997, the Ministry of Agriculture awarded the Pou d'Agouti a grant to study the White Sands area.

The organization now has the funding to maintain some skilled full-time staff, though all staffers still have to spend a considerable part of their time raising funds. Projects are planned at least one year in advance in order to find the necessary financing. Being "French" makes it difficult to gain access to many funding sources that focus on developing countries, but because the Pou d'Agouti is based on the border with Suriname, a growing number of projects are planned that involve both sides of the Maroni River.

Personal contact with members of grant-giving bodies is essential. The Pou d'Agouti's large number of publications helps convince donors of its ability to undertake and complete projects.

The Monitoring Program

Project Planning

Somewhat paradoxically, a challenging social issue in French Guiana is that wages are high and social aid is generously funded. The Pou d'Agouti sees this as a problem because it reduces incentives for people to embrace small-scale entrepreneurial activity. Most people would rather be paid by social services to do little work than labor hard at their own business for uncertain returns. This leaves job creation as the responsibility of the government, which favors top-down, overblown schemes (such as building roads through a forest) that are often environmentally destructive by design.

The main questions the Pou d'Agouti must pose are:

- What are the likely impacts of a proposed project?
- What small-scale projects can be implemented instead of the grand ones perennially suggested by local politicians?

The Monitoring Goal

The Pou d'Agouti determines a monitoring program by posing questions about government activities. Why is a site proposed as a reserve? Where are mining activities occurring? Are government reports accurate? Are environmental impacts of proposed projects reasonable or underestimated? What would be the impact of five or six potentially large Canadian and U.S. gold mines? Is the new mining law adapted to the province or adapted to special "arrangements"? Who is really responsible for applying regulations?

The Pou d'Agouti's projects usually intentionally include a human element. It often investigates both environmental and social problems created by non-indigenous human occupation or activities in the rainforest. The organization's location in a frontier town inhabited largely by indigenous Amerindians and Maroons—as well as its collaboration with human rights, Maroon, and indigenous NGOs within French Guiana and from Suriname—has made this approach necessary.

Data Collection

The Pou d'Agouti gathers its information primarily from four sources: the govern-

ment, organization members or associates, NGO networks, and (recently) some ecological fieldwork.

These data collection methods developed organically. At this point, the Pou d'Agouti feels that these methods are most appropriate to its situation. A scheme to employ French Guianese youth will give much needed stability to the Pou d'Agouti's staff, and at least one member will then be able to concentrate on structuring the monitoring process, undertaking field trips to verify or disprove data and rumors, and regularly consulting with all sources.

Government Information

Officially, the government must make its records public. However, it was initially difficult to get hold of government documents, primarily because of such agency evasive tactics as being perpetually out of documents. One of the first documents the Pou d'Agouti used was the environmental impact study of the dam at Petit Saut. More recently, the Pou d'Agouti obtained a government report on mercury poisoning in the interior. When the official reply to requests at the prefecture was that there were no additional copies of the report remaining, the Pou d'Agouti promptly made 100 photocopies for distribution to its allies.

More recently, as an environmental protection organization officially recognized by the Ministry of the Environment, the Pou d'Agouti has gained access to certain official records such as urban planning project documents. Also, by supplying the local members of the French parliament with useful unofficial information, the Pou d'Agouti often receives other documents in exchange.

Leaks by government employees to the Pou d'Agouti are quite common. Care needs to be taken, though, as some leaked information is inaccurate.

Ecological Field Work

Data collected for the White Sands project in 1997 and the roads project in 1998 involved extensive fieldwork and consultation with local populations, politicians, NGOs, and traditional leaders.

Remote Sensing

Since much of the extractive activity in French Guiana is small in scale (such as mining camps), many of the new approaches to data gathering and analysis based on remote sensing are not very applicable. The Pou d'Agouti therefore does not anticipate incorporating these tools into its data management, though flying over agricultural and mining areas is becoming a valuable backup to fieldwork.

Communication

The Pou d'Agouti has a number of communication strategies, each aimed at a different combination of audiences and meant to disseminate information from one of its activities. The principal target audiences for the Pou d'Agouti are government officials on the national and provincial levels, international conservation organizations, other local organizations, schools, and the general public.

Government

The Pou d'Agouti publicizes its monitoring information in a variety of ways, depending on the audience and goal. The information it receives about illegal activity in the interior is forwarded by telephone, fax, or letter to the agencies and ministries responsible for enforcement in those areas. The government has responded positively to these reports, even sending the army to disperse miners who were operating illegally. Other information is aimed at influencing provincial politicians who are enthusiastic about grandiose development schemes aimed at "opening the frontier." The Pou d'Agouti may do this through letters addressed to the politicians making reference to other similar and failed experiences in neighboring countries, an analysis of new laws, or by open letters and press releases published in the local press or media. It also responds to numerous individual requests for information.

By establishing a reputation for effectively reporting good information, the Pou

d'Agouti has gained stature and the respect of government. When a recent government report inaccurately concluded that the satellite launcher ARIANE 5 was pollution-free, the organization protested. The protest was relayed to a leading scientific magazine and a scientific board was appointed to review the document's conclusions.

The Pou d'Agouti is careful to maintain good government relations as long as it does not compromise its independence. For example, the Pou d'Agouti compliments government efforts worthy of praise, such as the sustainable forestry project, which envisions a 40-year rotation of managed plots.

Schools and the General Public

The Pou d'Agouti targets schools and the general public with its environmental education publications. It maintains a website with numerous links and publishes a magazine three times a year, as well as special issues on such themes as Ariane 5, mercury, mining, and deforestation. Audiocassettes for illiterate populations are produced on specific subjects in local languages and are distributed to local radio stations. Plans are underway to co-produce videos, CDs, and even CD-ROMs.

The Pou d'Agouti also supports the process of developing locally appropriate school materials. Most school materials are currently imported from France and have limited impact because of geographical and cultural differences.

The Pou d'Agouti Magazine

The Pou d'Agouti made its first symbolic action on Earth Day 1990. Actions on such symbolic dates continue, as does the production of its journal, *Le Pou d'Agouti*. A recent issue had a print run of 2,400. Planning for the communications products start well in advance. For example, each issue of the Pou d'Agouti magazine contains a special report on a specific theme. The choice of theme depends on the presence of a specialist to write the report and the need to address a particular issue.

Electronic Communication

At the Rio conference in 1992, the need to form networks was repeatedly emphasized. The Pou d'Agouti has helped to set up a network with local and regional NGOs in order to share information. Through this network, it shares information with its partners and receives information in return. Although this is helpful, the local lack of local electronic communication capability means that it is simpler to communicate with groups in Europe or North America than it is to communicate with other groups in French Guiana or neighboring countries. The Pou d'Agouti, through partnership projects, is helping to develop this capacity for communication among its partners. Communication with international conservation organizations is primarily through e-mail.

Networks with Other NGOs

The Pou d'Agouti has been invited to attend many government discussions on development issues. These are valuable opportunities to affect policy. In this regard, the Pou d'Agouti finds it very important to maintain strong ties with other NGOs. If the government were to exclude the Pou d'Agouti, it is likely that at least some NGOs would be included. Therefore, communication between these organizations allows the Pou d'Agouti to stay informed.

Being the environmental protection NGO with the best developed infrastructure in French Guiana, the Pou d'Agouti tries to publish or make its data available for other organizations that are trying to develop a regional presence. As such, the Pou d'Agouti coordinates the network "Itiulu Région Guyane," (the Itiulu Region of Guyana) which circulates information among local and regional (Guiana Shield) environmental, human rights, indigenous, and Maroon organizations. This effort has recently been reinforced by the Guiana Shield Media Project website.

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Introduction

The Sierra Legal Defence Fund (SLDF) was founded in 1990 as a nonprofit environmental organization. SLDF's initial goal was to provide free legal services to the Canadian environmental community in order to promote the conservation and sound, sustainable management of the country's natural resources.

Over the years, SLDF has conducted extensive monitoring of the environmental impacts resulting from natural resource extraction. SLDF has been involved in a variety of issues, including toxic pollution from mining and sewage, the environmental impacts of dam construction, and the rights of citizens to protest against corporate activities that threaten the environment. Many of Canada's significant environmental legal precedents are a result of SLDF's efforts. For example, SLDF won court victories that forced the Canadian government to carry out environmental impact assessments of hydroelectric and logging projects in Quebec and Alberta and halted clearcutting in Wood Buffalo National Park in Ontario.

A considerable portion of SLDF's work in British Columbia (BC) is focused on forestry. Forest Watch is one of its major projects.

SLDF is completely separate from the Sierra Club of Canada. It is supported by over 17,000 individuals across Canada, and it also receives funding from foundation grants.

Organization

Mission

SLDF's mission is to use legal remedies to protect the natural environment through the promotion and enforcement of the laws of Canada.

Based on the above mission, SLDF has three objectives for its overall work, including Forest Watch:

- "Level the playing field" for environmental groups that simply cannot afford to go to court against large institutions when important wilderness values are at stake;
- Bring carefully selected cases to court in order to establish a body of strong legal precedents that recognizes the vital importance of environmental values; and
- Provide professional advice on the development of environmental legislation.

The Monitoring Program

BC Forest Watch

The British Columbia Forest Watch Network was born out of the realization that the government was failing to provide good stewardship over BC's public forestlands. Forest Watch is based on the idea that people in every town and valley of British Columbia can work together cooperatively to uncover and credibly document what is happening in their own forests. Since its inception in 1997, BC Forest Watch has sought to unite a network of concerned citizens to systematically highlight the reality of forestry practices occurring in their communities. The main lesson learned from the BC experience is that public scrutiny is a powerful tool.

Credibility is paramount in this process. The success of the BC Forest Watch Network has been its ability to present irrefutable evidence of inadequate and illegal forestry practices in British Columbia. The often painstaking work of gathering evidence and reviewing complex plans has proven to be effective only because of the reputations of the individuals involved

and, increasingly, the reputation of the network as a whole. To ensure the effectiveness of the work that forest watchers do, this credibility must be maintained. This requires that forest watchers distinguish between their advocacy work and their investigative work.

Separating advocacy from investigative work is an often difficult challenge for most groups working on forestry issues. It requires a conscious effort to ensure the objectivity of investigative research. When we advocate improved forestry practices, we risk the credibility of our investigative work. Courts, administrative tribunals, Ministry of Forest officials, and certainly the logging industry give less credence to groups that simultaneously advocate a certain policy viewpoint and then attempt to audit and document facts. Regardless of the accuracy of the audit, it will be dismissed as partisan. It is not that investigative work and advocacy are incompatible–far from it. Instead, to achieve our individual goals, we can be most effective by collecting and effectively utilizing credible evidence of current illegal and unsustainable forestry practices. By choosing the right questions to answer with credible data, we can provide the platform for effective advocacy that is missing in BC.

How do SLDF and Forest Watch conduct their monitoring work?

SLDF and Forest Watch use a multidisciplinary team of lawyers, scientists, technicians, and knowledgeable local people to assess whether forestry laws and practices are compatible with environmental conservation and sustainability. These teams generally use a two-step approach to forest monitoring.

SLDF prepares for an investigation by examining all relevant laws, regulations, and policies in order to get a sense of which activities are legally sanctioned and which are not. Based on its extensive knowledge of the legislative scheme and available resources, Forest Watch has focused monitoring activities on a few key issues: roads, stream protection, cutting boundaries, terrain and soil issues, planning accuracy, and compliance with plans. SLDF and Forest Watch focus on these issues because 1) legal remedies exist to hold violators accountable; 2) these issues resonate with the public; and 3) these issues have ecological significance and can be objectively measured and documented using available resources.

In addition to studying the law, SLDF reviews the documents that forest concessionaires are required to submit to the government as part of the planning process. It makes use of Canada's extensive provincial and federal freedom of information laws. To be an effective forest watcher, it is important to know what information exists, who has it, where it is located, and what the various options are for getting it. In areas like BC, which relies on extensive planning of land uses, understanding and accessing the plans is a fundamental requirement.

A forest watcher could randomly roam logging roads looking for violations. However, considering the limited resources available to SLDF, Forest Watch, and most concerned citizens, this is not an effective use of resources. Instead, SLDF trains forest watchers to initiate fieldwork only after doing their homework.

The first step in the homework is to identify the problem you want to solve or the question you want answered. What are you trying to accomplish? Is there a particular bad company you want to focus on, or are there systemic problems within the industry? Are you looking for rogue actors or for government duplicity?

This is a key step. If you are not clear about your objectives, it will be difficult to determine an appropriate strategy.

Next, forest watchers must identify a goal. Is it to:

- Publicize the activities of one company or hold them legally accountable?

- Identify the systemic problems of a company, individual, or government ministry?
- Document violations for legal action?
- Document problems for the media and public consumption?
- Write a report to publicize the activities of one company or the industry as a whole?

At SLDF, we always try to find the easiest, most cost- and time-effective method to serve our purpose. If it is possible to credibly frame the issue through an analysis of planning documents, we do so. One lesson we have learned is that fieldwork costs money and can be dangerous. It should only occur after preliminary analysis has been completed.

Ultimately, we encourage all forest watchers to clearly identify their goals even if it seems easy and inexpensive to commence monitoring in an area. We have only so many human resources and it is imperative we use them wisely. As we tell forest watchers, "We will show you all the potential tools in your toolbox belt, but you are going to have to know when and how to most effectively use them."

The next step in our process is to identify the available resources. How many people can work on this? What kind of transportation can they use? How much money is available for expenses? The answers to these questions will frame our methodology and set limits. For example, it is impossible to access some remote areas if you have no boat or you cannot afford the cost of a flight. It is imperative to be realistic. There is no sense designing a methodology that is beyond your resources. Each tool has advantages and disadvantages in terms of the financial costs and human resources necessary. Regardless of the newsworthiness of the violation or problem, it does no good to design a media strategy targeted at the evening news if you do not have videotape or access to a video camera. Each part of your strategy needs to be assessed in relation to your resources. This should significantly narrow your options.

"Why are we doing this trip?"

If we can't answer that question, a trip may not be the best use of our time. We have to make sure we have a clear purpose in mind. It could be as simple as "check up on the company to let them know we're watching." Most often, a forest watcher should have a specific concern or suspicion that requires field verification (for example, you got a tip that the company dumped oil into fish-bearing waters).

As discussed previously, SLDF prepares for fieldwork by identifying a specific issue, problem, or question. If it appears that fieldwork is the best method to answer this question or gather this information, then we consider what information is accessible given our resources. In BC, this usually involves acquiring and analyzing the details of industrial forest management plans prepared by companies. Based on our experience, we can usually make an educated guess about whether the road or cutblock (logged area) in a plan creates significant environmental problems. After gathering as much information as possible and focusing our efforts on geographic locations where there is a high probability of success, SLDF goes into the field to attempt to confirm its initial assessments. Our findings are documented in a way that supports the project's purpose. That is, the sophistication of the data collection process varies depending on whether the information will be used to prepare a report or to prosecute someone for breaking the law.

Based on experience, we have determined that when writing a report it is best to deal with only a single indicator or series of related indicators. For example, SLDF is often concerned with whether the forestry laws are being followed. By reading the laws, we can identify numerous easily measured variables, such as the size of buffer zones left along streams or the amount of logging carried out on steep slopes that are prone to landslides. By addressing specific indicators of environmental quality in this way, SLDF is able to provide highly detailed and specific

information to support the findings in their reports.

How does SLDF conduct paper research?

In a planning-based management regime like BC, effective forest watching is possible by just looking at plans. The poor level of plan compliance with the law means that significant faults can be uncovered before logging takes place. Actually, this is the point of the planning-based provincial code.

Getting access to plans and other information is a skill that must be learned. Information gathering is probably the most time-consuming and trying aspect of forest watching. Finding out what is happening in BC's public forests is sometimes like pulling teeth. Getting even one document can be difficult. All the information you need is rarely contained in the same document. However, information provides knowledge, and knowledge is power, so it is important to persevere.

Before embarking on a mission to uncover the facts about activities in a local forest, forest watchers should bear in mind that they are about to become embroiled in a complex issue. Forest watchers must know specifically what they are interested in; otherwise they could get lost in a swamp of information. With a clear objective and a patient approach, they are much more likely to be effective.

Having determined what sort of information we want, our next step is determining what documents will provide us with this information. Our basic source of information is the operational plans and the assessments of key environmental values used in their preparation. They tell us who is logging, what sort of logging is occurring, and where and when the logging is taking place.

For information that is not in plans, we conduct research to determine what additional documents are needed. The more specific we are, the better people are able to help us. Most of the ministries and organizations we deal with are large. Many civil servants are just as in the dark as many of us are about information, if not more so. For government information, the government's own telephone directory, which usually lists the title and department of every civil servant, can be a useful way to ensure we get to speak to a knowledgeable person.

Our knowledge of the planning regime and government filing systems provides us with insight into where relevant information is located. To develop this knowledge, we have learned to always ask for a tour of relevant government and company offices. The more you know about how agencies and companies work and how and where they keep information, the better you can do your job.

Information from government or industry insiders can also be invaluable. Unsolicited tips from insiders are often the best source of information, so we try to cultivate those relationships. Many people within government, industry, consultants, and unions are very concerned about the same issues. They can be reluctant to share information because they are worried that it will be used out of context or misunderstood, or that their confidence will be compromised. As your reputation for credibility grows, your informants will increase. Here are three important rules:

- Credibility is paramount.
- Always protect your sources.
- Always take the time and care to understand the issues as fully as possibly.

How does SLDF do its field research?

Rule 1: Safety

Safety must be the number-one consideration in all aspects of a field investigation. Whether you are simply driving to a remote government office or headed out on a weeklong investigation of isolated helicopter logging, your personal safety and the safety of those you are working with is the top priority.

There are innumerable risks involved in Forest Watch and it is imperative that we

train to deal with them. Forest watchers must pack a good first aid kit and make sure that everyone is familiar with its contents and knows how to use them. Volunteers should be made aware of the risks involved with backcountry work. Field investigators should consider wilderness first aid training

Rule 2: Goal setting

Before embarking on any investigation it is vital that forest watchers identify for themselves their particular local goal. With a clear goal in mind, it is possible to set objectives for their investigation and the sort of follow-up that they will undertake. There are innumerable possible issues to investigate and making clear choices between them requires a goal.

Once forest watchers have identified a goal, they keep it uppermost in our minds. They try to refer all our plans back to the goal and ask themselves whether the investigative work they are undertaking advances that goal. They try to stay focused.

Rule 3: Preparation

The more forest watchers prepare, the safer and more effective they will be. We don't want to end up at a cutblock that was logged years ago if we are looking for recent problems. Forest watchers try to prepare so they know what they are after, where they are going, how they are going to get passed the locked gates, what the local logging company radio frequencies are, how they can recharge their video recorder's batteries, how they will measure the stream buffer width, and so on.

We try to be realistic about what we can do in a day. Is it summer (long hours of daylight) or winter (short hours)? It takes about two to three hours to completely examine a 10 to 20 hectare cutblock, so we need to make sure we plan accordingly. Forest watchers need to ask how far apart are the areas they are examining—in hours and minutes.

Forest watchers should bring what they need. If they are using a camera or video, they make sure the batteries are strong and they have backups. They bring adequate food and water. It is important to park the car facing an escape route so they can leave without turning around if there is a fire.

It is important to remember the purpose of the trip. Forest watchers should try to keep priorities in mind and make sure they achieve those goals in the time they have. Are they going to walk straight to that steep section of road that looks like it could slide? Are they going to place fish traps at the beginning of their investigation and then measure stream buffers? We try to use a 1:5000 map to save time in the field.

Forest watchers also have to plan the access route and determine how much time they need. It is important to remember to allow time for travel, getting lost, or dragging the boat off the rocks because somebody miscalculated the tides.

If we are going to look at specific cutblocks, we try to understand what the cutblock or road should look like on the ground and in relation to the surrounding landscape.

Communication

Tools for Getting Results

There are three major groups of tools: legal, media, and political.

- Legal tools include the law itself, Ministry of Forests' Compliance and Enforcement, administrative actions, civil actions, prosecutions, and judicial review.
- Media tools include e-mail news groups, personal contact with the media, web-based publicity, newsworthy events, press releases, reports, letters to the editor, open house for the local community, and print and television media stories.
- Political tools include building strategic alliances, involving senior Ministry of Forests staff, making a presentation to your town council, contacting your member of Parliament and preparing your findings for international audiences.

Strategize

Once forest watchers have well-documented findings, they face the choice of which tools to pick and how to employ them.

The strategy can be simple or complex. Whatever it is, forest watchers should map it out so it is clear to themselves and other forest watchers. It is important to be sensitive to issues of timing, which can make or break a strategy. Forest watchers keep their goal and message in mind and make sure they are using the strategy to reach the audience they believe can implement changes.

If you allow yourself to be ignored, you probably will be. Follow-up is the key to success. Following up includes making a few phone calls, making some personal visits, writing more letters, or issuing press releases. This process can be tiring, but it makes the difference between a campaign that is merely noticed and one that has an impact.

Reports

SLDF usually chooses to address only one environmental issue with each report. In part, this is because the media in British Columbia are not sympathetic to the environmental point of view. It is difficult to get media coverage of any environmental issue unless it is from a business angle. Therefore, SLDF attempts to keep its reports focused on a single issue. Complex issues simply are not reported in British Columbia newspapers.

Research reports. Reports are usually written to present the results of a monitoring project and are aimed at civil society. Their object is to educate people about forestry operations in Canada and inspire them to demand better management of their public lands. The reports are written in a simple and straightforward manner and are brief in order to appeal to a mass audience.

SLDF reports must be absolutely accurate. When a report was published in cooperation with another organization a few years ago, the other organization inserted a photograph of a cutblock taken a few years before the period quoted by the report. This one minor mistake gave the corporations and government ammunition to claim that the report was inaccurate.

Propaganda-busters. Sometimes a report is produced to specifically address the rhetoric of the major forestry companies operating in the province. This can be very important, since large corporations spend a lot of time and energy cultivating certain images. It can be a great blow to a company or to the industry in general if claims that are central to its image can be disproved. For example, the BC government and the logging industry spent millions of dollars in 1995 and 1996 convincing people that clearcutting no longer occurred in the province. Foreign journalists were given tours of selected logging areas, and BC politicians told newspapers, "We've stopped the Chop." In fact, little had changed and clearcutting remained the silviculture system of choice. By auditing the largest forest companies in each of the 43 forest districts, we were able to show that the method for 92.5 percent of logging in BC remains clearcutting.

Similarly, government claims of radically improved stream protection measures were belied by our report showing 83 percent of streams were being clearcut to the banks, including a majority of fish-bearing streams.

Using data to inform and improve lawmaking. SLFD also tries to use its expertise with both forestry law and monitoring to help shape new laws that will be more effective in protecting the environment. SLDF is in a unique position to take on this challenge, as it is involved in investigating how corporations circumvent regulations. Knowing this can help eliminate those loopholes.

This approach also has its difficulties because corporations and hostile government officials do not want meddlesome NGOs to have a part in creating laws that will reduce the timber companies' ability to mismanage the land with impunity.

SLDF must therefore approach this and all its communications with care. If it appears to be too liberal and unable to compromise at all, it reduces its chances that it will be able to participate in this process. The data generated through its reports and the insights gained by the hands-on experience of regional coordinators have been instrumental in gathering information and in negotiations for the entire BC environmental community.

An Example Of A Monitoring Project

Report on logging on steep slopes

Much of British Columbia is mountainous, with steep hills covered by old-growth forest. Unregulated logging on such steep slopes increases the chances of soil erosion and soil substrate instability, both of which lead to an increased probability of landslides. Logging steep, landslide-prone, unstable slopes greatly increases the number and frequency of landslides. Studies in BC by the Ministry of Forests have documented that logging these precipitous slopes increases the risk of landslides to 15 to 20 times the natural rate.

The enactment of the BC Forest Practice Code in mid-1995 mandated new requirements to prevent landslides. SLDF's interdisciplinary forest team employed legal and technical research, supplemented by field verification, to determine whether BC's "world class standards" for logging were likely to lead to a decrease in the number of landslides caused either directly or indirectly by logging. This research was documented in a 1997 report entitled *Going Downhill Fast: Landslides and the Forest Practices Code* available online at *http://www.sierralegal.org/reports/landslide_toc.html.*

The report attempted to answer simple questions:

- What has the Forest Practices Code done to reduce the likelihood of landslides due to logging?
- Are the risks associated with logging on steep slopes being well-managed? For example, are companies fulfilling their terrain requirements, and is this terrain information accurate?
- Is the government enforcing the provisions of the code relating to landslides?

Overview of the Law

The code uses mandatory planning requirements as a mechanism to prevent landslides and erosion on steep slopes. In order to reduce the likelihood of landslides, the code requires logging companies to assess terrain and landslide issues twice during the planning process. These planning requirements essentially involve ensuring that forest companies describe where hazardous slopes exist in a map on different scales of detail.

The first step in the process requires companies to map unstable sensitive areas on a broad scale in a Forest Development Plan (FDP). This step is the first line of defense against landslides because it acts as a trigger for further steps. This step is essentially an office exercise involving the interpretation of aerial photographs. One of the logging company's primary planning responsibilities is to identify all the sensitive terrain around its area of operation in its FDP. Failure to accurately complete this mapping leads to significant problems later in the process because key preventive measures and assessments will not be triggered.

At each step, logging companies are supposed to adapt their logging and road activities to the terrain. The second step, performing on-site "terrain stability assessments" of landslide-prone areas identified as sensitive in the first step, is a critical part of effectively fulfilling this function. This step involves on-site investigations of the area. This is the second line of defense. Again, accuracy is essential.

The third line of defense, and perhaps the most significant section of the code addressing terrain issues, is the section that explicitly prohibits clearcutting in areas that are "subject to a high likelihood of

landslides." Ostensibly, this section provides explicit limitations on the types of logging that can occur on vulnerable slopes. The inclusion of this section in the code reflects the lesson learned from past logging practices—that clearcutting in areas prone to sliding is unwise and should be avoided. Unfortunately, like most provisions in the new law, there is a loophole: a government forestry official can exempt a company from the provision and allow logging on the most landslide-prone slopes.

Methodology

The methodology used for the stream report was modified slightly and used again to assess the likely impacts of industrial logging on the probability of landslides in BC. In fact, we conducted the paperwork audit in district offices for the landslide report at the same time as we did the paper audits for the stream report. Since both audits looked at all cutblocks approved since the new law came into effect, we were able to save considerable time by combining our auditing efforts. The synergy between the two paper audits also allowed us to save money on travel expenses to the relevant forest district offices.

Our forestry team audited thirteen forest development plans from nine districts. As in all our investigations, we undertook many steps before our teams of biologists, lawyers, and data specialists actually went into the field.

In this case, we wanted to know how much of the proposed harvesting was on steep slopes in order to determine if the new legal protections were being implemented to decrease the risk of landslides. Since each development plan created by a timber company is legally required to contain a terrain stability map of the concession area, we examined these maps to determine the number and location of cutblocks identified by companies as being located in landslide prone areas.

Our next step was to analyze the accuracy of the terrain information supplied by companies in their plans. To do this, we used a variety of methods, including paper auditing and fieldwork. First, using the information in the terrain stability maps provided in the timber companies' management plans, we double-checked the accuracy of the companies' terrain designations by simply measuring the slopes of land in various cutblocks from the contour lines found on the maps themselves. We then compared these results with the mapping layers provided by the companies to determine if there were inconsistencies.

The slope measurements derived from the map contour lines were then verified by field measurements made in two of the cutblocks surveyed. Slope measurement was carried out using a clinometer. These measurements were then compared with those made by using the map-contour lines. This field verification showed a good fit between the clinometer measurements made in the field and those made from the maps. Our ability to verify our contour analysis in the field was limited by weather conditions. Most of the cutblocks we surveyed in our paper audit were located at higher elevations and, at the time of our fieldwork, were under numerous feet of snow, inhibiting our ability to use a clinometer accurately.

As we began investigating terrain-related issues, informants within government indicated to us that the ministry officials also had concerns about the accuracy of terrain information in company plans. In fact, a study had been commissioned to determine their accuracy. Through provincial freedom of information laws we obtained independent internal assessments of the quality of terrain studies.

One peer-reviewed document revealed major and endemic problems with the quality of terrain mapping. For example, the peer-reviewed study determined that all seven reconnaissance-level assessments were "judged to be poor to very poor." A separate Ministry of Forest review of 34 on-site assessments found that over half were judged to be of poor or fair quality and none was considered excellent.

Findings

Our research showed that, despite the severe long-term consequences, the code

had failed to adequately regulate logging on steep and unstable slopes. Our audit revealed that 45 percent of logging proposed by companies were slated for areas the companies had identified as having a moderate or high risk of landslides. The paper audit showed that 4 of the 13 plans studied had almost 80 percent of their logging planned on landslide-prone slopes. Almost all the proposed logging was clearcutting.

More than one-fourth of this logging (28 percent) was in areas that the companies themselves identified as Class V terrain, the areas mapped as having the highest risk of landslides. Given the regulations preventing clearcutting on such slopes, we were surprised to discover that 97 percent of the cutblocks slated for logging in these highly sensitive areas were being clearcut. Numerous studies have shown that clearcutting in these areas is the most destructive method of logging and greatly increases the probability of landslides and soil erosion. Some of the companies in our audit proposed clearcutting 100 percent of their cutblocks in these highly unstable areas.

Our research showed that the prohibition on clearcutting these highly landslide-prone areas was clearly being ignored by both logging companies and the Ministry of Forests. Since clearcut logging on Class V terrain is only supposed to proceed if an exemption is given by a government forestry official, we wanted to look at the rationales for allowing this destructive practice. In the majority of forest districts we audited, Ministry of Forests officials either "were not familiar " with this section of the law or "did not use" the section in their districts. In the district that had the greatest incident of landslides in BC, the Queen Charlotte Forest District, the responsible government official issued a blanket exemption to all licensees authorizing them to ignore this section of the code.

The combined results of the field- and map-based assessments demonstrated that timber companies were under-representing the amount of land in their concessions that was on steep, landslide-prone slopes (defined as being greater than 60 percent slope). In addition, several of the maps provided in the logging company's development plans had inadequate and missing terrain information, as well as terrain information that appeared to be highly inaccurate. Six plans, located in two forest districts, contained no information and had to be excluded from the analysis.

In the Chilliwack district, the logging company Interfor had identified 28 percent of its 114 cutblocks as containing landslide-prone terrain. Yet in this same district, SLDF's investigations showed that as much as 63 percent of the 114 cutblocks contained slopes greater than 60 percent, and many were greater than 70 percent.

The results were even more dismal for MacMillan Bloedel Ltd.'s concessions in the Port Alberni district. Of the 174 cutblocks examined, only 9 percent were identified by the company as having a greater than 60 percent slope. The SLDF assessment, however, found that 80 percent of these 174 cutblocks were on land with a slope steeper than 60 percent.

Conclusions

The disturbing reality of the "management" of terrain stability risks in BC's forest is that there are routine failures in every stage of planning and enforcement processes. Our report provides compelling evidence that BC's Forest Practices Code is failing to protect terrain. The code falls far short of creating the "world-class standards" so frequently touted by government and industry. Furthermore, careless, inadequate, or nonexistent planning, failure to rigorously enforce provisions of the law, and cynical evasions of the law by government and industry in the face of known hazards will result in increased landslides in the future. The cost of devastation to our forests and rivers is borne not by those causing the damage, but by all the people in BC.

Although the laws at the time of the report were obviously flawed, it is both ironic and unsettling that since the report the BC government has amended these laws to weaken, rather than strengthen, terrain protection and companies' accountability.

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Introduction

Telapak was first created in 1995 by a group of NGO activists and university graduates in the natural resources management field. In 1997, it was formally established as a legal entity. Telapak is headquartered in Bogor, and it operates in collaboration with a wide-ranging network of NGOs and other institutions within Indonesia and internationally. This network gives Telapak access to a variety of types of information, ranging from local field reports on activities affecting forests to satellite-derived and other macro data from international sources.

The Organization

Mission and Objectives

Telapak believes that all of Indonesia's territory is a conservation area. Biodiversity conservation, natural resource-based production, and the empowerment and livelihood security of resource-dependent communities must be integrated in a way that encompasses all aspects of the land and seascape, from the most remote forest and reefs to farmers' fields and fishing grounds.

Telepak's objectives include

- Strengthening transparency in Indonesia's natural resource management policies and practices by developing an independent system and network to monitor the status of, and trends in, the country's forest and coastal/marine ecosystems;
- Supporting and strengthening the local economic systems and natural resources management institutions of Indonesia's traditional communities; and
- Promoting new policies and practices to combat environmental degradation and support rehabilitation of forests and biological diversity in Indonesia.

Personnel

Telapak is a small organization, relying on collaborations with other local and international NGOs to provide much of the data it uses and to help disseminate its information.

Networking

As mentioned above, Telapak works with other NGOs, relying on them to conduct much of the monitoring fieldwork and investigation. This is an effective program design for Indonesia, with its many ethnic groups and huge geographic area. As a rule, Telapak and its partners share the same objectives and needs with respect to the promotion of sustainable and equitable natural resources management. This confluence of goals and interests forms the basis for the development of mutually agreed upon and equitable relationships between Telapak and its partners with respect to the exchange of data and information. The division of functions between Telapak and its partners is as follows.

Telapak:

- Catalyzes local funding and provides capacity-building for local partners through training programs;
- Collects (and provides its partners with) national-level data and information such as forest and other resource maps from the National Mapping Agency (Bakosurtanal);
- Promotes and sponsors policy dialogues and carries out advocacy at the national and international levels;
- Coordinates the exchange of information among various partners; and
- Works to strengthen political and legal support for the work of local partners.

Partner organizations:

- Determine the targets and key issues for

investigation and monitoring activities;

- Carry out field investigations and monitoring;
- Assist and strengthen the capacity of local communities in the investigation and monitoring processes;
- Facilitate the exchange of information with local communities; and
- Manage the data and information that results from field investigation and monitoring activities.

In order to build the capacity to fulfill these roles, Telapak provides technical assistance to local partners through training workshops in field investigation and monitoring, information management, and advocacy campaign development and management. Telapak also functions as the main national node for the monitoring and investigation network, as well as managing the communications network among its partners. In selected cases, Telapak staffers themselves carry out field investigations, particularly in cases in which there is a pressing, time-sensitive issue to be investigated that is outside the partners' working area.

Currently, Telapak's three main regional partners are the Irian Jaya Environment Foundation (YALI), the Leuser Conservation Foundation (YLL) in northern Sumatra, and PLASMA, an NGO based in East Kalimantan province. Through its partnership with these three NGOs, Telapak taps into a much broader network in each of these regions, since each of the three partner organizations acts as a node for many local NGOs in its region. In Irian Jaya, for example, YALI works in various regions of that vast province with the Asmat Traditional People's Foundation, the Irian Jaya Rural Community Development Foundation (YPMD), the World Wide Fund for Nature (WWF) Irian Jaya program, and various other groups. In this way, there are at least 20 institutions that are directly and closely connected to Telapak in the Indonesian forest-monitoring network.

Telapak uses its expertise and central position to coordinate and improve the efforts of its partner NGOs. By putting together training manuals and providing training to the local people who collect the data in the field, Telapak is instrumental in ensuring high-quality data from the numerous NGOs spread through a wide geographic area.

THE MONITORING PROGRAM

Based on the above mission, vision, and objectives, Telapak monitors the following issues:

- Logging policies and practices;
- Coastal and marine resources management and exploitation policies and practices;
- Trading and poaching of wildlife and other biological resources;
- Plans for large-scale development projects and the conflicts that result; and
- Cases or conflicts involving natural resources and traditional communities.

Telapak initially gathers secondary data (government reports, maps, and statistics, news media accounts, and the like), as well as anecdotal stories and reports from the field. Fieldwork is then conducted to verify and fill out the information obtained from secondary sources. This process is divided into six stages:

1. Identify the purpose of the investigation.
2. Collect and understand the secondary information.
3. Develop the data collection methodology and train the data collection crew.
4. Collect the data.
5. Analyze and disseminate the data.
6. Develop an action plan.

1. Identify the purpose of the investigation.

It is very important to have a clear purpose for an investigation. For example, a particular field investigation might be intended to provide compelling evidence with which to pressure the government to revoke the license of a particularly destructive and lawbreaking timber concession operator. Alternatively, the investigators could be participating in a timber

certification exercise, or they might be collecting evidence to gain wider recognition for a particularly successful community forest management system.

After identifying what the investigation is meant to accomplish, it is necessary to identify the data that will best achieve those ends. Telapak looks for specific indicators that are relatively simple to investigate, measurable, and will best provide evidence regarding the topic at hand. To investigate the legality and quality of logging on timber concessions, for example, Telapak has utilized indicators such as the size of trees harvested and the steepness of slopes where a road was built or trees cut. Monitors also note the geographic location of the logging activities, particularly with respect to neighboring protected areas, communities, water catchment areas, and the like. Related indicators in such a situation might include the existence of illegal sawmills, evidence of mining or poaching, and accounts of human rights violations.

2. Collect and understand the secondary information.

Secondary research is an important part of Telapak's investigation and monitoring strategy. Before investigators undertake the investigation of a logging concession, for example, they obtain the company's annual work plans for cutting blocks, maps, and other data that cast light on the concession's planned and actual activities. This is formally supposed to be public information, but in reality is often kept secret by both the logging firms and forestry bureaucrats as a matter of course. Obtaining access to this vital information, therefore, often demands making contacts with sympathetic individuals within relevant government agencies. Indeed, cultivation of good relationships with sympathetic officials often leads to a great deal of other information, such as leads on illegal activities that a conscientious official may wish to expose but does not feel he or she can do within the structure of the present bureaucracy.

Secondary legal research is also important. If the objective of an investigation is to provide evidence that a concession-holder is breaking the law, it is important that the investigators have a good working knowledge of the applicable laws and regulations, so that field observations can be accurately connected to clear legal violations.

In addition to providing important baseline information for the investigation and monitoring of ongoing activities affecting forests, secondary research is crucial in meeting Telapak's objective of forward-looking, proactive monitoring that can prevent forest degradation before it starts. Much of what passes for forest monitoring and information worldwide is essentially an assessment of damage already done. Telapak therefore stresses the importance of obtaining secondary data—such as the government's many five-year plans for various sectors and regions, and private-sector investment plans—that can serve as the basis for working against destructive activities and investments before they cause damage.

3. Develop the data collection method-ology and train the data collection crew

The next step is to plan the methodology and make preparations for the investigation team to go to the field. This is a very important step that is not as easy as is often thought.

In preparing the data collection methodology, the team works together to analyze various options and scenarios for data collection. Team members identify the relative weaknesses and strengths of each scenario and prepare themselves for the worst possibilities, ranging from bad weather and travel conditions to threats and obstacles from the party or parties that are the subject of the investigation.

Methodological decisions must also be made at this point about how the data will be collected. Choices include conducting interviews in local communities, living temporarily with the local people, or working directly in the timber concession operations area in the forest, which is often far away from human settlements and impossible to reach on foot.

After deciding on a data collection strategy, the members of the investigation team are prepared for their work. They have the

equipment and provisions that will be needed in the field. The members have their identity cards and any letters of introduction or transit. Preparation also includes skills training (such as refresher sessions with investigation manuals and other materials) and review of communications and health and safety procedures.

A guiding principle for field data collection is that the information collected must always, at a minimum, include accurate locational information (with Global Positioning System coordinates whenever possible) and the date and time of all observations and interviews. Documentation should be as complete as possible (comprising photographs, video footage, audio recordings, and written documents). It should include the names of all informants and parties involved in the matters under investigation, and accurate and complete descriptions of all cases of conflict pertinent to the investigation.

4. Data collection

Telapak's overarching data-gathering strategy is to use secondary sources such as documents and people who have secondhand knowledge of a situation to inform the collection of primary data. The primary data include field observations and interviews with primary informants.

Telapak is careful to ensure that all its monitors use the same methods in collecting data, enabling their findings to be compared. To this end, Telapak has found it necessary to produce a series of handbooks and manuals for its members to use. These handbooks help ensure that the monitors efficiently gather high-quality data that, because they are gathered with similar methods everywhere, can be compared regardless of which organization has produced them.

There are a number of rules that investigators follow regardless of the type of information they are engaged in collecting. First, they should continue an investigation only if they feel safe and secure. If the situation is too tense, the investigation is called off. Second, they should gather any data that fill in some gaps in the "big picture." This is important because, although investigations carried out for Telapak are well-planned and organized, the necessary data may be unavailable or impossible to obtain. There will always be problems, but remaining flexible will enable the gathering of some good information instead of none. Finally, Telapak tells its monitors to behave ethically and to keep a sense of humor.

Gathering data from informants: Telapak receives information from many people in Indonesia with knowledge of illegal and unethical company and government activities. Depending on who they are, the approach in gaining this information takes different forms. There are general principles that apply across the board. Informants give the investigators information because they want to tell someone and because they trust the investigators. In training its investigators, Telepak stresses the need to nurture their relationships with informants. Investigators should stress that they will not mention names in association with the data. Investigators also try to present the informant with a letter of introduction or a card from a local villager as a means of establishing trust. If the investigators assume a false identity, they will assume one that is not threatening to the people they are interviewing.

Field data collection: Telapak uses investigation and observation extensively as data-gathering tools. Employees of logging companies, local villagers, and government officials all serve as informants. Information is written and recorded using cameras and video recording equipment in both open and covert ways. A monitor will sometimes sign on with a company as a day laborer, working for a number of weeks while taking pictures and notes.

Although some of these undertakings need to be covert, others can be quite open. Many of the people interviewed by investigators are very happy to talk. Villagers often have grievances to voice due to the loss of their traditional land. Workers may feel resentment toward their company. Government officials may feel that the actions of their superiors are immoral. Knowing how to present yourself to people in different situations is an important aspect of this work.

Data analysis and dissemination

Usually, a team of people other than the field investigation team carries out the analysis of the data and information obtained from the field. This is important because the skills needed for field data collection are not the same as those needed for analysis. In addition, this allows for an automatic cross-checking and review process that better guarantees the objectivity of the whole investigation and analysis process.

Analysis is carried out through a series of discussions and consultations that involve a wide range of experts, including specialists in forestry and natural resources management, activists for communities and indigenous peoples, and experts in forestry and natural resources laws and policies. This broad process of consultation and input is based on the belief that the process of advocacy related to the results of an investigation must begin at the time that the results of field investigations are obtained and communicated to the various parties mentioned above.

For maximum effectiveness, Telapak believes that the continuing development of field investigation capacities and results must be combined with and integrated into geographic descriptions. To that end, Telapak and its forest monitoring partners in the field are increasingly utilizing Geographic Information Systems (GIS) tools and other spatial (mapping) data in the analysis and presentation of monitoring results.

Communication

Telapak uses a variety of media to disseminate its information. It relies on two basic strategies: private and open. The private strategy is used in situations in which Telapak knows that it has an ally in a ministry who can accomplish more with the information than Telapak can by going public. This has often been the case because of Indonesia's political climate. Ministers become defensive if attacked, but are often willing to exert pressure on the wrongdoers if information is provided to them quietly.

When this private method does not work or if the type of information is meant to be disseminated widely, Telapak uses many media. These include publications, videos, films, slide shows, art, and music. Due to the executive director's former professional involvement with media, Telapak has a very sophisticated understanding of media and many connections within Indonesia's media circles.

Telapak has drawn up guidelines for its publications. Basic to these is the need to remain nonjudgmental when presenting the information gathered by the monitoring—that is, a "just the facts" approach.

Action

Action on the basis of Telapak's investigations, monitoring, and analysis is carried out by other organizations. This strict division of labor ensures that Telapak's information-related activities remain relatively neutral—and are perceived that way. Accordingly, Telepak provides other institutions with the results of its investigations and analysis for use as the basis of campaigns on specific issues or cases, and other advocacy activities. In this way, the monitoring network can also concentrate its energies on the production of high-quality data, information, and analysis. Nevertheless, Telapak does provide recommendations for action in the areas of policy reform, community organizing, advocacy campaigns, lawsuits, and dissemination of information to the public. In practice, Telapak provides the results of its investigation and monitoring work to government forestry and land use agencies, provincial government agencies, other NGOs, protected areas management units, and the mass media.

Community organizing is one area of action that receives a good deal of attention from Telapak. It is carried out through the communication of the results of investigations and monitoring and the holding of workshops on monitoring for communities themselves. This kind of training also helps build the capacity of local communities to document their own natural resources management practices; evaluate them based on ecological, economic, and socio-cultural criteria; and promote community-based natural resource management alternatives.