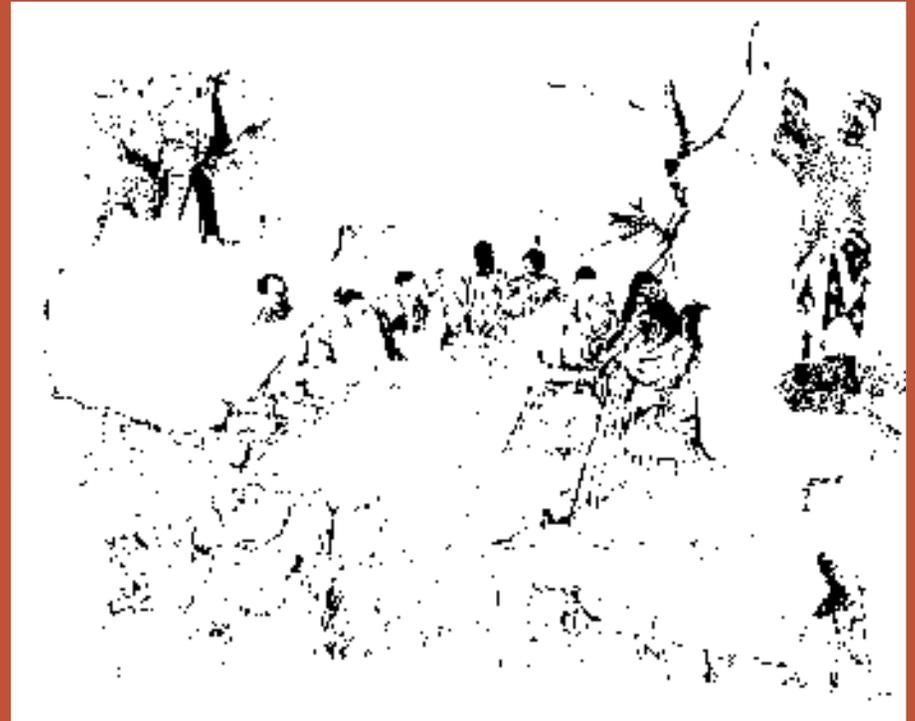


Understanding and Influencing Behaviors in Conservation and Natural Resources Management



Understanding and Influencing Behaviors in Conservation and Natural Resources Management

Bruce A. Byers



Biodiversity Support Program
c/o World Wildlife Fund
1250 24th Street, NW • Washington, DC 20037
phone 202-293-4800 • fax 202-293-9211

1-887531-23-8

Bruce A. Byers

Biodiversity Support Program
A USAID-funded consortium of the World Wildlife Fund,
The Nature Conservancy, and the World Resources Institute



Funded by the U.S. Agency for International Development



Understanding and Influencing Behaviors in Conservation and Natural Resources Management

Bruce A. Byers

African Biodiversity Series, No. 4

Biodiversity Support Program

**A USAID-funded consortium of World Wildlife Fund,
The Nature Conservancy, and World Resources Institute**

Table of Contents

| | |
|--|------|
| Acknowledgements | viii |
| Abbreviations | x |
| Preface | xi |
| Executive Summary | xiii |
| I. Introduction | 1 |
| Background..... | 1 |
| Why Emphasize Behavior?..... | 1 |
| Why Do Social Assessment and Research?..... | 3 |
| Why Emphasize Participation?..... | 4 |
| Values, Conservation, and Sustainability..... | 5 |
| II. The Process of Understanding and Influencing Behavior | 11 |
| Background..... | 11 |
| Models of the Process..... | 13 |
| A Synthetic Model..... | 17 |
| A Hierarchy of Means and Ends..... | 19 |
| Stages of the Process..... | 20 |
| III. Understanding Behaviors: Assessment and Research | 23 |
| Background..... | 23 |
| Assessing the Situation..... | 24 |
| Identifying Critical Behaviors..... | 25 |
| "Good" and "Bad" Behaviors?..... | 26 |
| Why Focus on Critical Behaviors?..... | 27 |
| Focusing on Specific Behaviors..... | 29 |
| Emphasizing the Positive..... | 29 |
| Behavioral Flexibility..... | 30 |
| Understanding the Key Factors That Influence Behaviors..... | 32 |
| Potentially Important Factors..... | 32 |
| Perceived Benefits and Barriers..... | 34 |
| Causal Webs or Wiring Diagrams..... | 41 |

| | |
|---|-----------|
| IV. Methods and Tools for Social Assessment and Research..... | 43 |
| Background..... | 43 |
| Methods and Tools..... | 44 |
| Literature Review..... | 44 |
| Surveys and Questionnaires..... | 45 |
| Direct Behavioral Observation..... | 48 |
| Interviews..... | 49 |
| Focus Groups..... | 50 |
| Community Meetings..... | 51 |
| Maps and Transects..... | 52 |
| Calendars..... | 52 |
| Matrices and Contrastive Analysis..... | 52 |
| Matrices of Historical Trends..... | 53 |
| Venn Diagrams..... | 55 |
| Wealth Ranking..... | 55 |
| Prioritizing Techniques..... | 55 |
| Decision Trees and Flow Diagrams..... | 55 |
| Methodologies..... | 55 |
| Rapid Rural Appraisal..... | 55 |
| Participatory Rural Appraisal..... | 57 |
| Participatory Research..... | 59 |
| Participatory Planning..... | 59 |
| V. Toward A Synthesis of Process and Methods for Understanding Conservation Behaviors..... | 63 |
| Background..... | 63 |
| Tools for Assessing the Situation..... | 63 |
| Who and What?..... | 64 |
| Where?..... | 67 |
| When?..... | 68 |
| Trends?..... | 70 |
| Tools for Identifying Critical Behaviors..... | 71 |
| Focus on Specific Behaviors..... | 72 |
| Prioritize Based on the Impact of Behaviors on Sustainability..... | 74 |
| Understand the Feasibility of Influencing Relevant Behaviors..... | 74 |
| Tools for Understanding the Key Factors That Influence Behaviors..... | 77 |
| Potentially Important Factors..... | 77 |
| Perceived Benefits and Barriers..... | 77 |
| Causal Webs or Wiring Diagrams..... | 80 |

| | |
|---|------------|
| VI. Promoting Sustainable Behaviors: Planning and Implementation..... | 83 |
| Background..... | 83 |
| Influencing Values, Knowledge, and Social Norms..... | 85 |
| The Limits of "Information-Only" Environmental Education..... | 85 |
| Modern Environmental Education and Communication..... | 86 |
| Environmental Social Marketing..... | 88 |
| Balancing Short-Term and Long-Term Approaches..... | 89 |
| Influencing Sociocultural Factors..... | 90 |
| Influencing Options and Skills..... | 91 |
| Options and Alternatives..... | 91 |
| Skills..... | 93 |
| Influencing Economic Factors..... | 93 |
| Influencing Laws and Policies..... | 96 |
| Resolving Disputes..... | 97 |
| | |
| VII. Evaluating and Improving the Process of Understanding and Influencing Behavior..... | 101 |
| Background..... | 101 |
| Using Evaluation Throughout the Process..... | 102 |
| Evaluation and Participation..... | 104 |
| Evaluation and Hypothesis-Testing..... | 105 |
| | |
| VIII. Conclusion..... | 107 |
| | |
| Recommended Reading..... | 111 |
| | |
| References..... | 116 |

Tables

| | |
|--|----|
| 1. Values and Uses of Biodiversity and Natural Resources..... | 6 |
| 2. Major Actors or Stakeholders in the Ranomafana National Park Area, Madagascar..... | 64 |

Figures

| | |
|---|----|
| 1. The Behavioral Interface between Ecological and Social Systems..... | 2 |
| 2. Cyclical Model of the Process of Understanding and Influencing Behavior..... | 13 |
| 3. Hierarchical Model of the Process of Understanding and Influencing Behavior..... | 16 |
| 4. Synthetic Model That Combines a Conceptual Hierarchy of Means and Ends with A Process for Assessing, Planning, Implementing, and Evaluating Activities..... | 18 |
| 5. Steps of the Assessment and Research Stage of a Process for Understanding Conservation Behaviors..... | 24 |
| 6. Behavioral Flexibility for Coping with Social and Ecological Crises in a Senegalese Village..... | 31 |
| 7. Diagram of Social System Components and Their Environmental Linkages..... | 41 |
| 8. Resources Map from a Household in Nepal..... | 53 |
| 9. Matrices of Historical Trends in Natural Resources and Land Use..... | 54 |
| 10. Natural Resources Management Activities by Gender, Okambuga, Namibia..... | 65 |
| 11. Matrix of User Groups and Natural Resource Uses, Koundou Watershed, Fouta Djallon, Guinea..... | 66 |
| 12. Resources Map from Zambrana, Dominican Republic, Showing Control, Responsibility, and Labor by Gender..... | 67 |
| 13. Transect from Kiboum, Cameroon, Showing Natural Resources and Land Uses..... | 68 |
| 14. A Seasonal Calendar from Mbusyani, Kenya..... | 69 |
| 15. Historical Trends in Natural Resources and Land Use from Okambuga Village, Namibia..... | 70 |
| 16. Historical Matrix of Resources and Land Use from Ndam Mor Fademba, Senegal..... | 71 |
| 17. Uses and Importance of Trees in Omuthiya Village, Namibia..... | 73 |
| 18. Pairwise Ranking Matrix of Behavioral Threats to Sustainability in Ranomafana National Park, Madagascar..... | 75 |
| 19. Resource Management Decision Matrix from Ndam Mor Fademba, Senegal..... | 76 |
| 20. Decision Tree for Identifying Factors That Influence Behaviors and Selecting Strategies to Affect Those Factors..... | 78 |
| 21. Quantitative Matrix of Costs and Benefits of Income-Generating Activities in Godavellagudda Village, India..... | 79 |
| 22. Venn Diagram Showing Village Social Institutions and Their Relationship to Institutions at Larger Scales from Ndam Mor Fademba, Senegal..... | 81 |
| 23. Matrix of Natural Resources Conflicts from Senegal..... | 98 |

Boxes

| | |
|---|----|
| 1. Conservation and Development in Madagascar: A Generalized Vignette..... | 12 |
| 2. Conserving Seabirds in Quebec..... | 14 |
| 3. Conserving the Golden Lion Tamarin in Brazil..... | 15 |
| 4. World Bank Social Assessments..... | 33 |
| 5. Understanding Behaviors: Examples form the Health Sector..... | 35 |
| 6. Benefits and Barriers in Zimbabwe's CAMPFIRE Program..... | 40 |
| 7. Examples of Survey Questions..... | 46 |
| 8. Tanzania National Parks/African Wildlife Foundation Knowledge, Attitudes, and Practices Survey..... | 47 |
| 9. Observing and Understanding Ngoni Hunting..... | 49 |
| 10. Community Extension and Outreach in the Tanzania National Parks..... | 51 |
| 11. Adapting Participatory Rural Appraisal for Integrated Conservation and Development Projects in Madagascar..... | 58 |
| 12. Participatory Park Planning in Tanzania..... | 61 |
| 13. Comparing Doers and Nondoers to Understand Perceived Benefits and Barriers: An Example from the Health Sector..... | 79 |
| 14. The USAID Environmental Education and Communication (GreenCOM) Project... | 87 |
| 15. Cheetah Conservation in Namibia..... | 92 |
| 16. The Biodiversity Conservation Network: An Enterprise-Oriented Approach to Community-Based Conservation in the Asia-Pacific Region..... | 94 |

Tables

| | |
|--|----|
| 1. Values and Uses of Biodiversity and Natural Resources..... | 6 |
| 2. Major Actors or Stakeholders in the Ranomafana National Park Area, Madagascar..... | 64 |

Figures

| | |
|---|----|
| 1. The Behavioral Interface between Ecological and Social Systems..... | 2 |
| 2. Cyclical Model of the Process of Understanding and Influencing Behavior..... | 13 |
| 3. Hierarchical Model of the Process of Understanding and Influencing Behavior..... | 16 |
| 4. Synthetic Model That Combines a Conceptual Hierarchy of Means and Ends with a Process for Assessing, Planning, Implementing, and Evaluating Activities..... | 18 |
| 5. Steps of the Assessment and Research Stage of a Process for Understanding Conservation Behaviors..... | 24 |
| 6. Behavioral Flexibility for Coping with Social and Ecological Crises in a Senegalese Village..... | 31 |
| 7. Diagram of Social System Components and Their Environmental Linkages..... | 41 |
| 8. Resources Map from a Household in Nepal..... | 53 |
| 9. Matrices of Historical Trends in Natural Resources and Land Use..... | 54 |
| 10. Natural Resources Management Activities by Gender, Okambuga, Namibia..... | 65 |
| 11. Matrix of User Groups and Natural Resource Uses, Koundou Watershed, Fouta Djallon, Guinea..... | 66 |
| 12. Resources Map from Zambrana, Dominican Republic, Showing Control, Responsibility, and Labor by Gender..... | 67 |
| 13. Transect from Kiboum, Cameroon, Showing Natural Resources and Land Uses..... | 68 |
| 14. A Seasonal Calendar from Mbusyani, Kenya..... | 69 |
| 15. Historical Trends in Natural Resources and Land Use from Okambuga Village, Namibia..... | 70 |
| 16. Historical Matrix of Resources and Land Use from Ndam Mor Fademba, Senegal..... | 71 |
| 17. Uses and Importance of Trees in Omuthiya Village, Namibia..... | 73 |
| 18. Pairwise Ranking Matrix of Behavioral Threats to Sustainability in Ranomafana National Park, Madagascar..... | 75 |
| 19. Resource Management Decision Matrix from Ndam Mor Fademba, Senegal..... | 76 |
| 20. Decision Tree for Identifying Factors That Influence Behaviors and Selecting Strategies to Affect Those Factors..... | 78 |
| 21. Quantitative Matrix of Costs and Benefits of Income-Generating Activities in Godavellagudda Village, India..... | 79 |
| 22. Venn Diagram Showing Village Social Institutions and Their Relationship to Institutions at Larger Scales from Ndam Mor Fademba, Senegal..... | 81 |
| 23. Matrix of Natural Resources Conflicts from Senegal..... | 98 |

I. Introduction

“To adopt the ethic for living sustainably, people must re-examine their values and alter their behavior.” IUCN, Caring for the Earth, 1991



BACKGROUND

This chapter will set the stage for the chapters that follow by introducing some key themes. First, we explain why we have chosen to emphasize behavior—the decisions, practices, and actions of people, both as individuals and in groups. We then discuss why social assessment and research is necessary to understand the social context of behaviors and to overcome the biases and test the assumptions of conservation practitioners. Next, we consider participation and explain why it is essential for understanding and influencing conservation behavior. Finally, we discuss the values that underlie and motivate conservation and natural resources management. For reasons explained in the section on values, we view “conservation” and “sustainable natural resources management” as the same thing; those terms will be used interchangeably throughout this report.

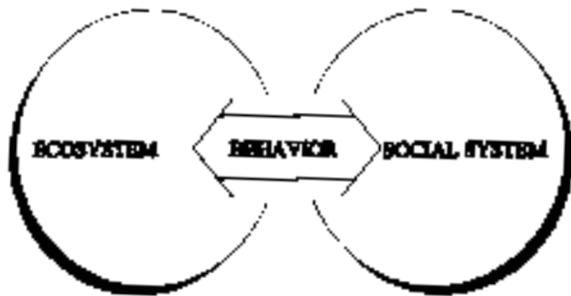
WHY EMPHASIZE BEHAVIOR?

People interact with their environment through their behavior. We will use the word “behavior” in this report to refer to the decisions, practices, and actions of people, both as individuals and in groups. The behavior of individuals and social groups forms the interface between ecological systems and social systems; behavior mediates the interaction between these two types of systems (Fig. 1). The constellations of behaviors we call natural resources management, conservation, integrated conservation and development, and human ecology occur at this interface between ecosystems and social systems.

This behavioral interface is “where the rubber meets the road”—an analogy that is perhaps more apt for developed countries than developing ones. Behavior is where the axe meets

the tree; the hoe meets the soil; a tree is planted; a wild plant is gathered for traditional medicine; industrial chemicals are dumped into a stream; goats are grazed on desert grasses; a sacred grove is protected from commercial loggers. All such behaviors can be thought of as adaptations or responses to the social and ecological environment. Because they are the interface between social systems and ecosystems, behaviors can provide “windows” into those systems.

Figure 1. The Behavioral Interface between Ecological and Social Systems



Many behaviors affect natural resources. Individuals at all levels—from subsistence farmers to park wardens, project managers, and presidents—make decisions and engage in practices that affect natural resources. At Lake Nakuru, Kenya, some people grow living thorn fences to prevent wildlife from damaging gardens. At the Bwindi/Impenetrable Forest, Uganda, some people refrain from cutting trees in the forest preserve. In Ghana, some communities maintain sacred groves. On Mafia Island, Tanzania, some fishermen harvest fish and shellfish at unsustainable rates. In Kasungu National Park, Malawi, some local people harvest nontimber forest products such as edible caterpillars and honey. In Gabon, some commercial hunters supplying the “bushmeat” trade are killing wild animals at unsustainable rates. In Nigeria, some

farmers have increased the length of fallow periods. In Madagascar, some communities maintain traditional taboos against killing lemurs. And in Zambia, some people plant millet and sorghum instead of maize to reduce crop damage from wildlife. Similar examples occur throughout Africa. Growing irrigated crops, grazing livestock, clearing forests for cultivation, making charcoal for sale, deferring to traditional leaders in land-use decisions, guiding wildlife tourists, maintaining ancestral graves, and avoiding certain areas because of taboos, all affect natural resources in a complex mix of positive and negative ways.

Some behaviors deplete natural resources or degrade the environment. These behaviors create economic or social problems, or constraints, for one or more groups of people alive today or for future generations. Other behaviors use natural resources sustainably, without degrading or depleting them. Promoting sustainable natural resources management requires efforts to maintain certain behaviors and change others.

We make a fundamental assumption in this report: that the decisions, actions, and practices made at all levels (local, national, and international) are made by people acting in ways that they perceive to be in their own best interest, given their background, values, and situation. Outsiders—actors from national or international levels—should assume that local people who use and manage resources directly are making what they perceive to be the best choices they can, given their options. The assumption should be, unless there is a great deal of evidence to the contrary, that local management practices are often sustainable and ecologically wise, and if they are not it may be because the choices available to local people are constrained by factors outside their control.

WHY DO SOCIAL ASSESSMENT AND RESEARCH?

People involved in promoting conservation and sustainable natural resources management are increasingly recognizing the pivotal role of human and social factors in their work. Until quite recently most of these people were preoccupied with ecological concerns. Many were trained in ecology, wildlife biology, forestry, agriculture, or fisheries. The recognition that natural resources management involves managing people's behavior toward natural resources, at least in part, has sometimes given rise to considerable confusion and apprehension among those practitioners.

Why do social assessment and research? One reason is to learn about, understand, and conceptualize the social system—the context in which conservation behaviors happen. To promote ecologically sustainable behaviors and discourage unsustainable ones, conservationists must first understand what is really going on. Understanding the social context of behavior is necessary to overcome biases and test assumptions. It is needed to design activities that are socially, as well as ecologically, sustainable. In this report we will use the word “assessment” to mean all aspects of the research, investigation, analysis, or appraisal stage of the process that is needed to develop an understanding of the social and ecological context of environmental behaviors as well as of the factors that motivate and determine those behaviors.

Social assessment provides the methods and tools for working with people and understanding the context of their decisions, practices, and actions. It may help conservation practitioners move beyond their biases and assumptions to figure out why people do what they do vis-à-vis the environment and how specific behaviors fit into their broader livelihood strategies. Natural resource managers would not think of

taking steps to influence and manage plant and animal populations without doing some research to understand the ecosystem first. Such research is needed to test hypotheses that underlie management actions and to allow prediction of the results of those actions. Actions taken to influence people's behavior likewise must be grounded in an understanding of the social and ecological context in which they occur. Developing that understanding requires social assessment.

Human behavior is extremely complex. Behaviors that affect the sustainability of natural resources may involve many actors and actions, and take place over long time periods. So many social factors are usually involved that it is hard for either communities or outsiders to know how to begin to solve problems and work toward sustainability. Given this complexity, it is often difficult to know exactly which behaviors should be targeted for maintenance or change, and what to do to affect those behaviors. Too often activities are designed based on untested assumptions about the social situation and people's behavioral motivations. This lack of understanding of what is really going on is a sure recipe for failure. Social assessment is needed before beginning activities, projects, or programs; it is also needed for monitoring progress toward objectives and evaluating results.

Some scholars and practitioners express the view that only trained social scientists can, or should, do the social assessment needed to plan, implement, and evaluate conservation activities. But many practitioners and communities lack the resources to hire trained social scientists to provide the social information they need. No one disputes the fact that conservationists and natural resource managers need to be familiar with the basic concepts and methods of ecology to do their job, and it is seldom argued that they have to be professional ecologists.

Nonprofessionals trained in some basic ecological methods have been very effective in the conservation field. “Parataxonomists” are one example. We believe that, in a parallel way, conservation practitioners and natural resources managers need a basic level of social literacy, and they can benefit from learning some basic methods and tools of social assessment. They could also benefit, of course, from advice from trained social scientists, especially at critical points in the process. In a parallel way, parataxonomists must depend on help from professional taxonomists to back them up in identifying species that they cannot, with their limited training, identify by themselves.

Finally, a caution and a note of humility. Social and ecological systems are both exceedingly complex, and not even the best social and ecological research—whether carried out by professionals or practitioners—can provide sufficient knowledge to fully understand and predict the dynamics of either system or their interaction. We must always be ready to question previously held assumptions and test new hypotheses about how to foster sustainable environmental behaviors.

WHY EMPHASIZE PARTICIPATION?

“Properly mandated, empowered and informed, communities can contribute to decisions that affect them and play an indispensable part in creating a securely-based sustainable society.” IUCN, Caring for the Earth 1991

Sustainable natural resources management requires integrating the values and interests of a range of actors and stakeholders from all levels—local, national, and international. In this report we will use the term “stakeholders” to refer to individuals or groups with an interest in the use and management of the natural re-

sources base in a particular place, area, or region (Brown and Wyckoff-Baird, 1992; IIED, 1994). Integrating the values and interests of the diverse actors and stakeholders requires participation from all levels. Poor, rural people often have the most direct interest in the local natural resources base, however, and they are often the most politically and economically marginalized of any stakeholder group, so their active participation is especially important. Local people often have:

- *rights* to local natural resources
- indigenous, local *knowledge* about how to manage local natural resources sustainably
- the *power* to implement and sustain natural resources management activities over the long term

In rural Africa people depend heavily on natural resources for their livelihoods. For those people, sustainable use of natural resources and human well-being are inextricably linked. Local residents often have a tremendous wealth of indigenous knowledge about the natural resources in their environment and about how to manage them sustainably (Biodiversity Support Program, 1993; Davis, 1993a, 1993b; Davis and Ebbe, 1994; Oldfield and Alcorn, 1991; Freudenberger & Gueye, 1990). But rural people also may be poor, sometimes to the point of mere subsistence, and may have few options for coping with the challenges of making a living. Through loss of access to resources they otherwise could use, they often pay most of the costs of conservation. Meanwhile, the majority of benefits from using natural resources, in the form of revenue from logging, wildlife tourism, or hunting, often go to distant urban elites. For conservation to succeed and natural resource use to be sustainable, local people must benefit somehow.

“Participation” is not a simple, unitary concept, but rather a continuum from “passive” to “active.” Activities and programs that have been called participatory span a wide range, from local people giving information to outsiders to help them design projects—a very passive form of participation, if it deserves to be called that—to more and more active forms such as co-management of externally-initiated projects or community-initiated “self-mobilization” (Brown and Wyckoff-Baird, 1992; IIED, 1994).

To some people, discussions about understanding and influencing behavior sound sinister. The assumption seems to be that it is the behavior of local people that is to be manipulated by outsiders, in a top-down, nonparticipatory fashion, to serve the interests of distant elites. Perhaps it is a common assumption because it has happened so often in the past. Nathaniel Chumo, of the Government of Kenya’s National Environment Secretariat, for example, wondered whether an approach that emphasized behavior was designed “to serve the interests of local communities, or to serve the interests of project managers and rich-country conservationists.”

The process and methods described in this report should be useful to practitioners seeking to foster conservation and sustainable natural resources management by helping them initiate a participatory problem-solving process that can clarify the values and interests of all stakeholders. It should serve the interests of all stakeholders in solving conservation problems, not solely the interests of one or another stakeholder group. The importance of trust and rapport to the success of such a process cannot be emphasized enough. Long-term commitment; patience; and honest, open communication are all key ingredients in building trust and rapport.

VALUES, CONSERVATION, AND SUSTAINABILITY

“Values are revealed in behavior.” Miller, Shinn, and Bentley, 1994

Humans have always depended on biological resources to provide them with life’s necessities and amenities: food, fuel, shelter, medicine, recreation, spiritual instruction, solace, and aesthetic pleasure. People make decisions about how to use the natural resources in their environment in the context of their values. Each community and culture has its own array of values.

Values “are elusive, abstract descriptions of what we think is important” (Miller, Shinn, and Bentley, 1994). People’s actions and choices give reality to these abstract constructs. “Our choices reflect what our values are and what order of importance we give them... We reveal our true values in the choices we make and the actions we take” (Miller, Shinn, and Bentley, 1994).

The range of potential values and uses of biodiversity and natural resources can be depicted as shown in Table 1. The distinction is often made between the use or instrumental value of nonhuman species and ecosystems and their intrinsic value—value independent of any use value they may have to people (Fox, 1990). This dichotomy is certainly the major ethical watershed in thinking about the value of non-human species and ecosystems.

Table 1. Values and Uses of Biodiversity and Natural Resources

Instrumental or Use Value — Nonhuman species and ecosystems have value because of their usefulness to humans.

- **Use Now**

- Material Uses/Values

- Direct: Food, clothing, shelter, water, medicine

- Basic needs, necessities (subsistence)

- Wants, amenities (more than subsistence)

- Indirect: Life support or ecosystem services

- Ecological cycles (water, carbon, nitrogen, oxygen, etc.)

- Degradation of wastes and pollution

- Pest and pathogen control

- Nonmaterial Uses/Values (psychological or emotional)

- Religious (beliefs, taboos, totems, ceremonial value)

- Spiritual and aesthetic (solace, meditation, beauty)

- Scientific and educational (laboratory and classroom)

- Recreational (physical or nonphysical)

- Historical

- Existence

- **Future Use**

- Material Uses/Values — direct and indirect, as above

- Nonmaterial Uses/Values — as above

Intrinsic Value — Nonhuman species and ecosystems have value independent of any value to humans

Within the category of use value, a dichotomy exists between the values of use now and the values of future use. The value of future use is sometimes called “option value,” as in “keeping options open” for the present generation at some future time, as well as for future generations (McNeely, et al., 1990). Keeping open for the future the same options for using natural resources that we have had is only fair, it has been argued. This has been called the principle of fairness to future generations. Option value applies to all uses of natural resources that we may value now, both direct and indirect material uses as well as nonmaterial ones. Scientific and technological uncertainty makes impossible or greatly complicates the valuation of future use in most cases. Unless we can predict the future with certainty, we can only guess what biodiversity resources we may need to meet future needs.

Use values, whether present or future, can be of two basic kinds: material uses and values and nonmaterial uses and values. Material uses of biotic resources include direct uses, such as for food, clothing, shelter, and medicine. These direct material uses can meet basic needs and supply amenities that go beyond subsistence needs. Material uses can also be indirect, providing such ecosystem or life-support services as the cycling of water, atmospheric gases, and essential nutrients; the control of pests and pathogens; and the degradation of wastes and pollution. Scientific uncertainty makes impossible or greatly complicates the valuation of indirect material uses; for example, we do not know, in many cases, what species may contribute to pest and pathogen control.

The nonmaterial values of biodiversity and natural resources derive from their many religious, spiritual, aesthetic, scientific, educational, recreational, and cultural uses (Fox, 1990). Given the diversity and importance of these nonmaterial uses, it is surprising that many

people, including some conservationists and natural resources managers, sometimes hardly think of them as uses at all. Some of these nonmaterial uses may fill human needs and may not be merely amenities; humans may require or need exposure to wild nature for psychological health, for example. “Existence” value is best thought of as a kind of nonmaterial psychological or emotional use; people “find satisfaction in knowing that the oceans hold whales, the Himalayas have snow leopards, and the Serengeti has antelope” (McNeely, et al., 1990). These nonmaterial values and uses play important roles in many African societies (Omari, 1990).

Many kinds of uses, whether material or nonmaterial, can be economic, in that people are willing to pay for them, or they can otherwise provide direct monetary and economic benefits.

Table 1 shows clearly that a simplistic dichotomy between use and conservation (or preservation, for that matter) of natural resources is a misconception. Even strict nature preserves, closed to all or most human entry, can produce many diverse benefits and values and be used in the true sense of the word. We may preserve wild, natural habitats to protect their indirect material uses, such as the ecosystem services they provide in the form of clean water from watersheds, for example. Or we may preserve them for their nonmaterial uses and values of many kinds, such as aesthetic, scientific, educational, or recreational.

According to the *World Conservation Strategy* (IUCN, 1980), conservation is “The management of human use of the biosphere so that it may yield the greatest sustainable benefit to present generations while maintaining its potential to meet the needs and aspirations of future generations. Thus, conservation is positive, embracing preservation, maintenance, sustainable utilization, restoration, and enhancement

of the natural environment.” Conservation is use, of many kinds, but sustainable use; the same is true for preservation. This is the reason we use the terms “conservation” and “sustainable natural resources management” interchangeably in this report.

The critical distinction is thus not between “use” and “nonuse,” but between sustainable and unsustainable uses of diverse kinds—whether direct material, indirect material, or nonmaterial. Unsustainable uses can be recognized because they cause ecological changes that occur faster than natural background rates of change or replenishment—in other words, they cause depletion or degradation of the resource being used. This report is fundamentally grounded in the view that the sustainability of the natural resource base is a value that should be supported.

If forced to choose among the values and uses shown in Table 1, some priorities are obvious. People have to eat, and if they must choose between starving and killing the last member of an endangered species for food, it is likely that they will choose to eat. In making choices, people generally—but not absolutely by any means—give priority to basic, direct material needs; then to direct material wants and amenities; then perhaps they consider some indirect material values, if they understand them; then nonmaterial values; then future use values. Finally, perhaps, they consider the intrinsic value of nonhuman species and ecosystems. Thus, Table 1 is organized in a rough hierarchy, with basic subsistence values and uses at the top, and intrinsic value at the bottom. An old man in Zimbabwe expressed something important about this relativity of values when he said: “When we are hungry, elephants are food. When we are full, elephants are beautiful” (Ricciuti, 1993).

Considerations related to time also influence people’s choices within this hierarchy. Immediate needs, like eating today, take precedence over future needs, like eating next year. People often discount the future, and if faced with a choice between getting something now or later, they will often choose to get it now. When resources are scarce, conservation may be a low priority for people who depend on them. People may even act in ways that they know or suspect will harm the resource base and make life harder for them in the long term. If people are to use natural resources sustainably—to conserve them so they can continue to meet the needs and wants of the future—they must have realistic choices. They must not, for example, be faced with a choice between feeding their children or degrading the environment.

In contrast to valuing present over future use, however, many traditional societies place a high value on minimizing risks, and in some cases this motivates sustainable practices. Such risk-averse cultures make decisions less on the basis of short-term material values than do more consumption-oriented societies; in some sense they discount the future less than more materialistic, “developed” societies (Mace, 1993; Mwangi and Perrings, 1993). Ruth Mace (1993) shows, for example, that among a pastoral group in northern Kenya, people “forego short-term gain in favour of long-term household survival.”

Landscapes and seascapes are mosaics of different human uses. Some areas can be managed for multiple uses, but some uses are mutually exclusive. Fishing may be incompatible with scientific research on fish populations in a certain lake, for example. Or logging in a forest may be incompatible with maintaining its function as a watershed.

Societies and communities are not homogeneous. They are made up of people with diverse values and different interests in using natural resources. This community heterogeneity presents challenges for natural resource management and conservation. The fact that some values and uses are mutually exclusive leads—naturally—to natural resources management controversies and conflicts. Behaviors that benefit some people in the community may hurt other people, the community as a whole, or future generations.

The ethical dilemmas of conservation are often complicated. People alive today (including local, national, and international actors), future generations of humans, and nonhuman species all have an interest or a stake in conservation and natural resources management. Given sometimes mutually exclusive options and high levels of scientific uncertainty, the ethical questions are not simple and cannot be simplified.

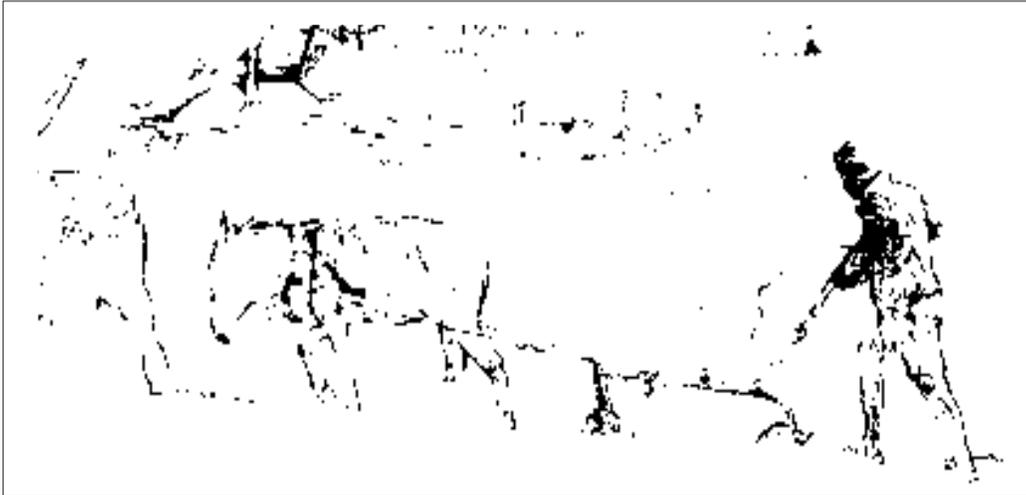
Successful conservation requires integrating the values and interests of a range of human stakeholders and actors—not to mention the nonhuman stakeholders. These people vary widely in political and economic power, options, and level of interest in a place and its resources. Human stakeholders in African conservation range, for example, from rural Africans whose crops are routinely damaged by elephants to urban Europeans and North Americans who are entertained and inspired by elephants, which most of them experience only indirectly on television or in zoos. The fact that there are multiple interests and stakeholders in conservation and that they range from local people to distant outsiders cannot be ignored; it is a fact that must be dealt with.

Conservation practitioners—people who work to foster and promote sustainable natural resources management—must recognize that they themselves are, or represent, one group of stakeholders and actors. They are not neutral third parties, and they should be clear about the values they hold and bring to their work. In many cases, practitioners working for international conservation organizations based in developed countries emphasize values different from those of the local people. They often emphasize non-material uses such as scientific, educational, recreational, and existence uses, or even intrinsic value, rather than the direct material values and uses that are often the priorities of local residents. Such differences can easily become a source of misunderstanding and even conflict unless clearly articulated.

Management of human uses of the environment in a way that simultaneously meets the needs and aspirations of people alive today, that safeguards options for future generations of humans, and that protects nonhuman species from extinction and ecosystems from destruction is an ideal to work toward. Given the diversity of competing values and uses and the high level of scientific uncertainty about biodiversity and the ecological and evolutionary mechanisms that maintain it, balancing all of these values and uses is probably an impossible dream. In some cases it may be necessary to constrain the needs and aspirations of people alive now—at local, national, or international levels—to safeguard the rights and options of future generations or to prevent the extinction of nonhuman species. For nonhuman species, “extinction is forever.” When a species becomes extinct not only is its intrinsic value lost, but all of its future uses and option values are lost too.

II. The Process of Understanding and Influencing Behavior

“A sustainable planet is not possible without patterns of conserving behavior. Never before have so many behaviors needed to change in so short a time.” DeYoung, 1993



BACKGROUND

We learned several things during our desk research, interviews, and field work that, taken together, lead us to conclude that a conceptual model of the process of understanding and influencing behavior could help people trying to foster sustainable natural resources management in the field. We found that activities undertaken to foster conservation:

- often have broad, vague goals and need focusing strategies to help identify clear goals and objectives
- are often based on minimal social assessment and therefore often begin with minimal, partial, or biased social information
- are not often based on participatory research, or participatory planning

- are often based on untested, and sometimes mistaken, assumptions made by their planners and implementers, either about what behaviors are ecologically sustainable or what social factors motivate those behaviors
- are not often evaluated for effectiveness

A hypothetical illustration of some of the problems often encountered in the field is given in Box 1.

We also learned that although there are many methods and tools for gathering social information, these are not sufficient by themselves. Information-gathering methods alone do not provide a conceptual framework for setting goals and objectives, designing and implementing activities, and evaluating the effectiveness of those activities.

Conceptual models can help organize and guide the initial assessment, planning, implementation, and evaluation of activities that aim to foster conservation and sustainable natural resources management. In this chapter we will examine some models of the process of understanding and influencing behavior that have been developed and used in conservation and natural resources management, agricultural extension, and health promotion. We will then present our own version of a process model that incorporates elements from several other models.

Understanding and influencing natural resources management behaviors may not often, in practice, be a smooth linear progression as suggested by stepwise models. But thinking of the process as a series of steps can help practitioners and the communities in which they work to “conceptualize a complex process that is not necessarily linear in nature” (Dietz and Nagagata, 1995). Any model should be used in a flexible and iterative way. There is no single right way to carry out the process of understanding and influencing environmental behaviors.

Box 1. Conservation and Development in Madagascar: A Generalized Vignette

In the area around a large nature reserve, an area exceptionally rich in species and diverse habitats, an international conservation organization developed an integrated conservation and development project (ICDP). Project managers in this hypothetical ICDP wanted people from poor villages in the buffer zone of a nature reserve to stop grazing cattle in the reserve, cutting trees for charcoal production, and practicing slash-and-burn cultivation of cassava in the area's forests. They assumed that economic motivations were primary, and therefore tried to develop alternative sources of food and income as substitutes for what they believed to be unsustainable practices. Project activities focused on increasing irrigated rice production in the buffer zone and improving roads to make transportation to local markets easier. An environmental education campaign was also carried out.

These interventions had some success, but also a number of puzzling and disturbing failures. The environmental education campaign was clearly successful; everyone, even young children, could explain the value of forests in watershed protection and irrigation. Because of better water management, rice production had increased. And using the improved road, the villagers were transporting more rice than ever before to local markets. But the evaluation also showed a number of failures. Even more cattle than before were grazing in the reserve's forests. Forests in the buffer zone, and even inside the reserve, continued to be cleared for maize and cassava cultivation and cut for charcoal-making.

What went wrong? It turned out that the villagers mostly eat maize and cassava and that rice is primarily a cash crop. As a result, increased rice production did not mean more food to eat but more income. That money was spent mostly by wealthier villagers to buy more cattle, which then grazed in the reserve's forests. The increased number of cattle did not translate into better diets. The village usually reserved cattle for sacrificing at funerals, when they kill large numbers to honor the dead and use their horns to decorate tombs. In addition to buying more cattle for funerary sacrifices, the income from the increased rice production also allowed the village's wealthier farmers to hire poorer farmers, or outsiders from the lowlands, to clear and burn fields on the edge of and even within the reserve.

The project's designers had assumed that economic rationality was the primary basis for decision making about natural resources, but they failed to understand how complex even economic values can be. They mistakenly assumed that increasing rice production and income from rice sales in local markets would substitute for benefits from environmentally destructive practices such as charcoal making and slash-and-burn cultivation of cassava in the reserve. They also ignored or minimized some very deep sociocultural values that act as powerful determinants of behavior in this case. Finally, they did not adequately consider the implications of the socioeconomic diversity of the community with which they worked.

Fortunately, this is not a true story. It is hypothetical but true-to-life, a composite drawn largely from the real experiences of several integrated conservation and development projects in Madagascar. The vignette illustrates the problems that can arise if project activities are designed and implemented based on untested assumptions, without adequate social assessment and research to understand the factors that motivate behaviors.

Source: Adapted from Grimm and Byers, 1994.

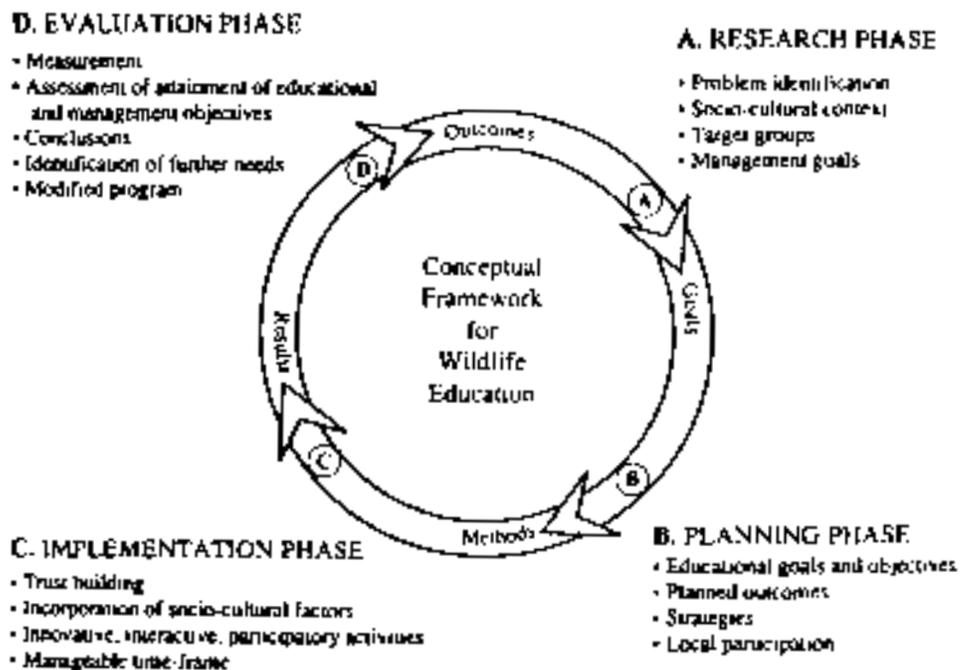
Practitioners will need to adapt the model to fit each unique situation.

MODELS OF THE PROCESS

Models of the process used to plan, implement, and evaluate activities for influencing conservation behaviors have been developed by a number of practitioners (Dietz and Nagagata, 1995; Jacobson, 1991; Pomerantz and Blanchard, 1992; Wood and Wood, 1990). These models have many elements in common: most include an initial assessment, research, or problem-definition stage; a design or planning stage; an implementation stage; and monitoring and evaluation components. Some practi-

tioners call this process the project cycle. One such model, shown in Figure 2, was developed by Gerri Pomerantz and Kathleen Blanchard based on an exhaustive literature search for examples of the use of environmental education to achieve wildlife management objectives. From six case studies of conservation education programs whose success could be demonstrated by evaluation, Pomerantz and Blanchard identified some common “working features of effective communication and education programs.” These features were then incorporated into the stepwise “conceptual framework for wildlife education” shown in the figure (Pomerantz, 1992; Pomerantz and Blanchard, 1992).

Figure 2. Cyclical Model of the Process of Understanding and Influencing Behavior



Source: Pomerantz and Blanchard, 1992, p. 161

Box 2 describes a process—like that shown in Figure 2—that was used successfully to influence behaviors affecting seabird conservation in Quebec, Canada.

Box 2. Conserving Seabirds in Quebec

The Quebec Marine Bird Conservation Project is an example of a successful process for understanding and influencing behavior to promote conservation goals (Blanchard, 1987; Blanchard and Monroe, 1990). The project was started by the Quebec-Labrador Foundation in 1978, with the support of the Canadian Wildlife Service, to respond to dramatic declines among nesting seabirds on the North Shore of the Gulf of St. Lawrence between 1955 and 1978. A central goal of the project was explicitly behavioral: to reduce the illegal harvest of seabirds and their eggs by people from local communities. Some of the project's other objectives, such as to "encourage the development of a conservation ethic," and "teach practical seabird biology," were not described in explicitly behavioral terms.

Initial social assessment and research provided background for planning project activities that were "sensitive to the culture and conditions of the coast." Several social research methods, especially an oral survey administered during individual interviews with 140 heads-of-households, provided this background information. The survey revealed several kinds of factors underlying the harvesting of seabirds and their eggs. It revealed a lack of knowledge of laws protecting seabirds. It also showed that social norms were a barrier to changing the behavior: harvesting seabirds and their eggs was considered acceptable by most residents, and most residents had little respect for laws protecting birds. Eating seabirds and their eggs was a cultural tradition: before the 1960s, when imported food became more widely available on the Quebec North Shore, a direct economic benefit—the use of birds for food in the "semi-subsistence" economy of the area—motivated the practice. Today cultural and recreational factors, rather than economic needs, largely motivate the behavior.

A variety of activities designed to influence the factors that motivate seabird and egg harvesting were carried out. Most of those activities aimed to change awareness, knowledge, values, attitudes, and social norms through education, communication, and outreach—a logical strategy, given the kinds of factors found to motivate the behavior during the assessment and research stage of the process. Project activities tended to be highly participatory and very much oriented toward building trust and support in the local communities (Blanchard, 1987; Blanchard and Monroe, 1990).

The Marine Bird Conservation Project incorporated an evaluation dimension that provides an excellent demonstration of the effectiveness of the project. A follow-up survey of heads-of-households was conducted in 1988, six years after the initial survey in 1981-82. The 1988 survey showed several "significant changes in local knowledge of wildlife law, attitudes toward hunting and regulations, and level of harvest of birds and eggs" (Blanchard and Monroe, 1990). Although it is only an indirect measure of behavior, the mean response to the question "What percent of families in your village harvest seabirds and eggs?" dropped significantly from about 76 percent in 1981 to 48 percent in 1988, for example. Recent seabird censuses show that population declines have been halted and populations of some species have started to increase in the area.

Box 3 describes the work of the Golden Lion Tamarin Project in Brazil, which also followed a model like that shown in Figure 2.

Box 3. Conserving the Golden Lion Tamarin in Brazil

The Golden Lion Tamarin Project, which aims to conserve this Brazilian monkey and its habitat, is another example of a successful process for understanding and influencing conservation behavior (Dietz and Nagagata, 1995; Nagagata, 1994). Goals of the project were to slow or stop the destruction of the lowland Atlantic Forest habitat of the golden lion tamarin and to stop the hunting of tamarins and their capture for the pet trade.

The assessment and research stage of this project consisted of informal interviews with local community leaders and use of a questionnaire-based survey of knowledge and opinion. This research provided information about some of the relevant determinants of behavior. Lack of knowledge of the monkey and its habitat requirements was clearly a barrier to stopping the destruction of the forests in which the golden lion tamarin lives, and to convincing private landowners to register their remaining forest as permanent conservation reserves. For example, 41 percent of adults surveyed could not recognize a golden lion tamarin from photographs. Most did not even know that a local forest reserve existed and most did not attribute the decline in local wildlife populations to habitat destruction (Dietz and Nagagata, 1995). Social norms and economic factors also seem to influence behaviors that affect the monkey and its habitat (Archie, Mann, and Smith, 1993).

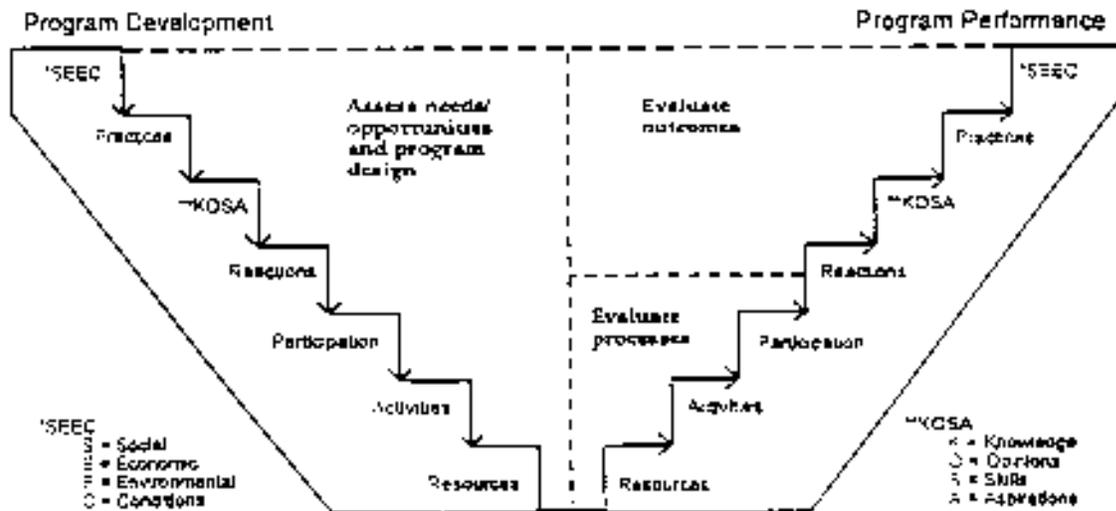
Project activities were mainly of an educational nature, designed to influence awareness and knowledge, attitudes, and values. As in the Quebec Marine Bird Conservation example (Box 2), an educational strategy makes sense in this case, given that assessment and research showed that lack of awareness and knowledge were important factors influencing relevant behaviors. As in the Quebec example, the project worked patiently to develop a constructive relationship with local community leaders and to involve the community in the planning and implementation of activities.

Evaluation has demonstrated the project's effectiveness (Dietz and Nagagata, 1995; Nagagata, 1994). The results of a follow-up survey in 1986 were compared with the results of the initial survey in 1984; the comparison indicated significant changes in knowledge and attitudes of local Brazilian adults and students. Since no other activities or media events occurred in the area, "... these changes can be attributed to two years of this project's activities" (Dietz and Nagagata, 1995).

Another useful conceptual model was developed in 1976 by Claude Bennett of the U.S. Department of Agriculture's Cooperative Extension Service (Bennett, 1976) (Fig. 3). Bennett's model is based on a hierarchy, or "chain of events in extension programs," that links inputs of resources with "social, economic, and environmental conditions (SEEC)" —the outcomes of activities, projects, and programs. Behavior—called "practices" in Figure 3—plays a central role in this linkage. The model provides an integrated way of looking at program planning, implementation, and evaluation: "A strength of the hierarchy is that

it helps integrate extension program development with process and impact evaluation ... programmers use the same concepts in program development and evaluation. That is, the model's concepts guide need and opportunity assessments as well as program design as programs are developed.... And, these same concepts guide process and impact evaluations of program performance" (Bennett and Rockwell, 1995). Bennett's model has been adapted for use in environmental education (Steelquist, 1993), and it continues to be refined for use in agricultural extension (Bennett and Rockwell, 1995).

Figure 3. Hierarchical Model of the Process of Understanding and Influencing Behavior



Source: Bennett and Rockwell, 1995, p. 7, Fig. 4

The USAID Africa Bureau uses a conceptual model—the “Natural Resources Management Analytical Framework”—in the design, implementation, and evaluation of activities, projects, and programs in Africa. As in the hierarchical model developed by Bennett (Bennett and Rockwell, 1995; Bennett, 1976; Steelquist, 1993), behavior occupies a central position in this USAID framework (USAID 1992, 1993a; Weber, 1992).

Models of behavior-centered program planning have also been developed by education, communication, and social marketing practitioners working in other development sectors (USAID, 1993b; Graeff, Elder, and Booth, 1993; Smith and Middlestadt, 1993; Fishbein and Middlestadt, 1987, 1989). They have been used to guide the design, implementation, and evaluation of programs to prevent HIV infection (Smith, et al., 1993), to influence child survival practices (Graeff, Elder, and Booth, 1993; Seidel, 1993), to promote the use of oral rehydration therapy and increase immunization rates (USAID, 1993b), and to promote better agricultural practices (Mata, 1992).

A SYNTHETIC MODEL

The process model illustrated in Figure 4 is adapted from the models just discussed and explicitly emphasizes the role of behavior in conservation and natural resources management. The model combines the stages of the process of understanding and influencing behaviors (sometimes called the project cycle) like those shown in Figure 2 (Pomerantz and Blanchard, 1992) with a six-level conceptual hierarchy, adapted from that shown in Figure 3 (Bennett and Rockwell, 1995).

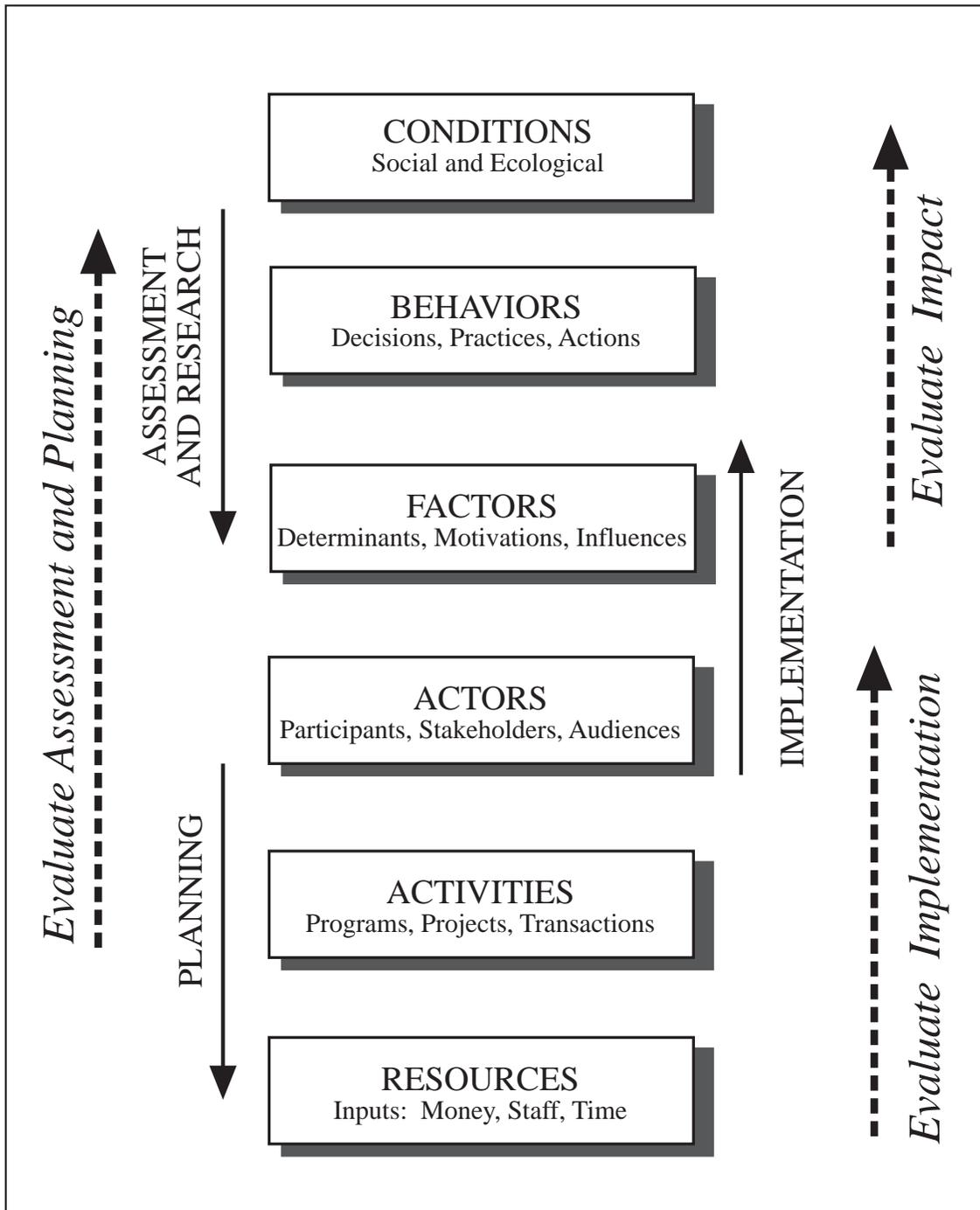
The levels of the hierarchy shown in Figure 4 represent a chain of cause and effect, with lower

levels somehow influencing or causing changes at higher levels. The levels also represent a chain of means and ends. At the bottom of the hierarchy, resources and activities are means that can be used to achieve certain ends—the behaviors and social and environmental conditions at the upper levels of the hierarchy. These ends are the goals or desired outcomes of the process, and they reflect the values of the stakeholders involved, especially those contributing resources to the process. The hierarchy is thus a conceptual tool for thinking about and linking inputs and goals—means and ends—in a programmatic sense.

This process model should not be interpreted in a rigid, linear, or simplistic way. It is only a tool to help conservation practitioners and communities conceptualize their situation and discover or invent solutions for themselves. As Bennett and Rockwell (1995) say: “Like all models, the hierarchy oversimplifies reality. Simplification is necessary to provide a user-friendly model for viewing programming. The actual sequence of events in programming does not always proceed in accordance with the model.”

Conceptual models like that shown in Figure 4 can guide and integrate the process of understanding and influencing behaviors in conservation. Such a process can be used in the design of new activities, projects, and programs. It can also be adapted and used to enhance or improve ongoing activities. For example, the assessment and planning stages of programs already under way can be evaluated retrospectively, and any problems found can be corrected to improve implementation. The implementation process itself can be evaluated and improved, and outcomes or impacts evaluated.

Figure 4. Synthetic Model That Combines a Conceptual Hierarchy of Means and Ends with a Process for Assessing, Planning, Implementing, and Evaluating Activities



Adapted from Bennett and Rockwell, 1995; Pomerantz and Blanchard, 1992; Steelquist, 1993

A Hierarchy of Means and Ends

Although the model presented in Figure 4 is synthetic, combining the stages of a process or project cycle with a causal means-ends hierarchy, it is the hierarchy that provides the logical framework for any activity, project, or program. This hierarchy will therefore be discussed first, and in the next section the stages of the process of linking means and ends in a programmatic sense will be presented. The six levels of the means-ends hierarchy shown in Figure 4 are discussed briefly below:

Social and Ecological Conditions

This level is concerned with the social and ecological situation in a particular place vis-à-vis sustainability. Is the situation socially and ecologically sustainable? Do human decisions, practices, and actions successfully integrate conservation and development in this situation—that is, are resources used in such a way that they support the well-being of people now without being degraded or depleted, so that future generations will have the same options for supporting their well-being? What are the environmental problems? What are the opportunities?

It should be reiterated here that this report is fundamentally grounded in the view that the sustainability of the natural resource base is a value that should be supported. With this perspective, achieving social and environmental sustainability is the goal of conservation and natural resources management.

Behaviors

This level is concerned with the behavioral interface between social and ecological systems—with the decisions, practices, and actions of both individuals and organizations that medi-

ate between the ecosystem and society (see Fig. 1). What are people doing here that affects social and environmental sustainability? What are they doing that is ecologically sound and sustainable? What are they doing that is leading to depletion or degradation of biodiversity and other natural resources? Which behaviors are the biggest threat or problem? Which have the most potential to provide for human well-being sustainably?

Factors

This level is concerned with the social and ecological factors that determine, motivate, or influence the behaviors at the next level of the hierarchy. What do the actors themselves perceive as the benefits of, or barriers to, their behaviors. Are these factors internal and psychological or external, structural, and systemic? Are they conscious or unconscious? How important, relatively, are various determinants of behaviors, such as knowledge, values, social norms, sociocultural factors, options, skills, economics, laws or policies?

Actors

This level is concerned with the people who can control or influence the factors at the next level. These actors are those who will be the participants in, and audience for, activities that aim to foster conservation and sustainable natural resources management. These are people who have the power to change or maintain the mix of benefits and barriers that motivate given behaviors—who can influence the factors that influence the behaviors that influence the ecological and social conditions. They may or may not be the ones actually doing the behaviors that affect environmental and social sustainability. For example, actors at this level could be legislators in the national parliament who have the power to pass laws giving local com-

munities the right to own and manage wildlife or forests in their area, or they could be local people chopping the trees or hunting animals. It all depends on the situation.

Activities

This level is concerned with what programs and projects do with and for the actors in order to influence factors at the next higher level. Do they pay these actors? Fine them or put them in jail? Teach them new skills? Give them new information? Build a road, a clinic, a dam, or a school? These activities can be thought of as transactions or exchanges between one group of stakeholders (represented by the project or program) and the actors (who can influence the factors that influence the behaviors that influence the conditions). People behave in ways that they perceive will be in their best interest. Thinking of activities aimed at influencing people's behavior as a transaction or exchange is a way of respecting those people while still trying to influence what they do. Transactions or exchanges aim at mutually beneficial, win-win solutions, in which all of the stakeholders get something they want. Although this ideal is not always attained, it often is possible, especially if creative thought is given to possible transactions.

Resources

This level is concerned with the inputs required to make activities happen. Resources—often money, but also such things as staff time, information, and other indirect inputs—are the fundamental means used by one group of stakeholders to promote ends that they value. In the cases with which we are concerned, a group or groups of stakeholders who value ecological and social sustainability, conservation, and sustainable natural resources management provide the resources and inputs for activities.

Stages of the Process

As depicted in Figure 4, the process of linking means and ends in a practical, programmatic sense can be described as the stages of a project cycle—assessment and research, planning, implementation, and evaluation and improvement. Each of these stages is discussed briefly below. A more detailed discussion of each stage is presented in later chapters.

Assessment and Research: Toward Understanding Behaviors

The assessment stage begins by assessing the social and ecological conditions in a place—the top level of the conceptual hierarchy. This is the level of ultimate interest and concern to conservationists and natural resources managers. Working downward in the hierarchy, the assessment stage develops an understanding of the causal links between social and ecological conditions and the behaviors that affect them. It then moves down to the next causal level, developing an understanding of the factors that influence those behaviors.

Planning: Designing Activities to Influence Behaviors

Only after adequate assessment has been done to understand the social and ecological situation, the behaviors that affect the situation, and the factors that influence those behaviors can conservation practitioners plan appropriate and feasible activities. Planning involves thinking through the causal links between the lower levels of the hierarchy. The factors that influence critical behaviors and the actors that can affect those factors, activities that can elicit desired reactions from those actors, and inputs of resources needed to carry out those activities must all be considered.

Implementation: Promoting Sustainable Behaviors

Actually expending resources to carry out activities with actors is the implementation stage of the process. Resources are often money, but they can also be staff time, information, and other indirect inputs. These resources support activities that involve or affect people. The participants in, or audiences for, these activities are actors—and probably stakeholders—in the natural resources management situation of concern.

Evaluating and Improving

Evaluation should take place at all stages of the process of understanding and influencing natural resources management behaviors, and all levels of the conceptual hierarchy (Bennett, 1976; Bennett and Rockwell, 1995; Steelquist, 1993). It is an integral part of the whole process of understanding and influencing conservation behaviors (Jacobson, 1991; Rugh, 1992). The assessment stage of the process can and should be evaluated, and evaluation information used to modify and improve it. Likewise, the planning and implementation stages can and should be evaluated and improved.

Evaluating the impact or outcome of a program involves a before and after comparison of conditions at the higher levels of the ends-means hierarchy—in other words, social and environmental conditions, the behaviors that affect those conditions, and factors that affect those behaviors. Information about initial conditions at those levels was gathered during the assessment stage; evaluation involves another round of information gathering at the end for comparison. Such an evaluation of program outcomes or impacts can be used to improve the design of future activities.

As discussed in the Background section of this chapter, we have found that quite often the earliest stages of the process of understanding and influencing conservation behaviors are the weakest. Too often conservation projects have started implementing activities without careful attention to assessment and research, only to run into problems later. Without adequate assessment, activities are not likely to be as effective as they could be.

In this report we focus on the assessment and research stage of the process because this appears to us to be an unfilled niche that our analysis can help to fill. The next chapter, Chapter III, will discuss some steps of the assessment process in more detail. Chapter IV reviews some methods and tools of social research that can be used for assessment and research. Chapter V begins to pair information-gathering methods with the steps of the assessment process; examples illustrate how specific methods can be used to obtain specific kinds of information.

Because the focus of this analysis is the assessment stage of the process of understanding and influencing conservation behaviors, this report will not give as much detail about the planning, implementation, and evaluation stages of the process. Chapter VI gives some examples that illustrate how an understanding of behaviors provided by assessment and research can inform the design and implementation of a wide variety of activities—ranging from education and skills training to policy reform and economic enterprise development—aimed at influencing those behaviors. Chapter VII presents more information about evaluating and improving the process.

III. Understanding Behaviors: Assessment and Research



BACKGROUND

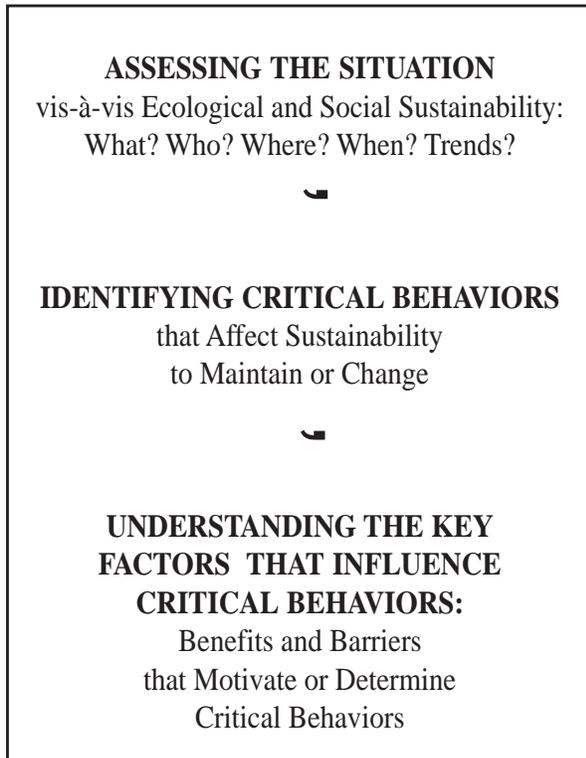
In the previous chapter we presented a model of the process of understanding and influencing conservation behavior. We did so to meet a need identified by our desk research, interviews, and field work. That work also identified another problem: we found that quite often the first, indispensable step of the process—developing some understanding of why people do what they do—was the weakest. We found that activities designed to influence conservation and natural resources management behaviors are often based on untested, and sometimes erroneous, assumptions made by their planners and implementers. Assumptions about what motivates behaviors, or whether those behaviors are sustainable, are not often checked through social assessment, especially of a kind that involves real participation in the process by the actors themselves.

Too often conservation projects have charged ahead, implementing activities without enough assessment and research to understand what is really going on. Not surprisingly, such projects often run into problems later. Because the rest of the process depends on understanding what is really going on, this report, and our analysis as a whole, focuses mainly on this essential first stage. The assessment and research stage of the process outlined in the previous chapter leads toward an understanding of critical conservation behaviors and the social and ecological context in which they occur.

We have divided the assessment stage of the process into three steps: (1) assessing the situation, (2) identifying critical behaviors, and (3) understanding key factors that influence critical behaviors (Fig. 5). These steps correspond roughly to the top three levels of the conceptual hierarchy shown in Figure 4: assessing the

situation involves a broad investigation of social and ecological conditions; identifying critical behaviors focuses at the level of behaviors; and understanding key factors moves down to the factors level of the hierarchy.

Figure 5. Steps of the Assessment and Research Stage of a Process for Understanding Conservation Behaviors



ASSESSING THE SITUATION

The goal of this step is to identify decisions, practices, and actions involved in people’s interaction with their environment and develop an understanding of the social and ecological context of those behaviors. A broad view of social and ecological conditions is taken at this step. Questions to ask about the conservation and natural resources management situation include the following:

What?: What are people doing that affects the environment? How are they using it (in a broad

sense of the word “use,” including nonmaterial and indirect material uses—see Introduction, Table 1). What actions, practices, decisions, and behaviors affect natural resources in this specific situation? Which of these behaviors contribute to depletion or degradation of resources important to one or more groups of actors, stakeholders, or users and are therefore seen as problems by them? Which represent opportunities for one or more groups?

This initial step is sometimes called problem assessment, problem identification, needs assessment, or problem definition. Conservation and natural resources management problems—apparently unsustainable situations—are often what attract the attention of agencies, nongovernmental organizations (NGOs), and donors to a given location in the first place. Looking at this step in a positive, rather than a negative, way, however, it could be treated as opportunities assessment. The goal would be to find the sustainable behaviors people are already using and support and enhance those behaviors—to look for what is right rather than what is wrong.

Who?: Identify actors at all levels and understand the heterogeneity present in the community with regard to natural resource management practices (other approximately equivalent terms now in use: stakeholder identification or analysis, identification of user groups).

Where?: Understand the spatial distribution of behaviors that affect natural resources.

When?: Understand the temporal distribution of behaviors that affect natural resources.

Trends?: Understand long-term trends related to the sustainability of decisions, practices, and actions. Are they leading toward depletion or degradation, stability, or increase in a given resource?

IDENTIFYING CRITICAL BEHAVIORS

After a general understanding of the social and ecological conditions has been developed, the next step is to refine and focus that understanding by identifying critical behaviors to target for maintenance or change. The goal of this step is to identify the critical behaviors of relevant actors (including individuals and organizations or groups at the local, national, and international level)—those behaviors that have the largest impact on ecological sustainability. Questions to ask include the following: What are people doing here that is ecologically sound and sustainable? What are they doing that is unsustainable, leading to the depletion or degradation of biodiversity and other natural resources? Which behaviors are the biggest threat or problem? Which have the most potential to provide for human well-being in a sustainable fashion?

Examples from the field illustrate the wide range of behaviors practitioners are concerned with.

In Madagascar, for example, practitioners carrying out integrated conservation and development projects would like local communities to maintain a number of behaviors, including the following:

- staying out of the mountain forests of the area
- not killing lemurs
- growing irrigated rice in valleys outside the reserve

They would like to change the following behaviors of local people:

- grazing cattle in the reserve's forests
- making charcoal for sale outside the area

- practicing slash-and-burn cultivation in mountain forests
- maintaining large cattle herds for funerary sacrifices that don't contribute much to the quality of everyday diets

At Lake Nakuru, in Kenya, an integrated conservation and development project supported by Overseas Development Administration of the British Government and the European Union, and managed by WWF-International, is working with local communities surrounding Lake Nakuru National Park. Project staff would like local people to maintain the following behaviors:

- sustainable harvesting of forest products for food, medicine, fuel, shelter, and other subsistence needs (by small-scale farmers living near the remaining forested portion of the lake's watershed)
- planting and maintaining living thorn fences to keep baboons from raiding their crops
- protecting the forests in the lake's southern watershed

Project staff would like to change a number of behaviors, including the following:

- using farming techniques that lead to high levels of soil erosion (on small farms on the northwest edge of the park)
- failing to maintain land as pasture for small-scale dairying
- rapid cutting of forests in part of the lake's watershed
- failing to collect garbage in the city of Nakuru, on the north edge of the park
- allowing frequent overflow of untreated sewage into the lake from the two sewage treatment works in Nakuru town

At Kasungu National Park in Malawi, staff of the Department of National Parks and Wildlife Management would like local people to continue these practices:

- gathering edible caterpillars at sustainable rates in the park
- organizing community beekeeping clubs and keeping bees in the park

They would like people to stop these practices:

- entering the park to kill elephants
- cutting the park's electric fence to let animals out so that they can kill them for food
- cutting the fence and using the wire for snares to trap animals

“Good” and “Bad” Behaviors?

The examples given above are behaviors that conservationists and natural resource managers would like to change or maintain. But sometimes different natural resources stakeholders have different views of what behaviors are important or critical to change or maintain—which are “good” and which are “bad.” How do we decide which behaviors should be changed, and which should be maintained? Who should define good and bad behavior?

Different views about which behaviors are critical to change or maintain can be found among the stakeholders in the Ngorongoro Conservation Area (NCA), for example. The NCA is a multiple-use area adjacent to Serengeti National Park in northern Tanzania. The area is supposed to be managed for the benefit of resident Maasai pastoralists and wildlife; it attracts large numbers of foreign tourists, who come to see the wildlife, scenery, and colorful resident Maasai. Some local Maasai leaders in the NCA would like government staff to:

- allow them to continue cultivating small plots of maize and potatoes, and perhaps expand cultivation
- provide a place for a cultural village where tourists could come to buy crafts and food, and watch dancing and take photographs for money
- reduce controls on their use of Ngorongoro Crater for water, salt, and grazing for their livestock
- develop new water points in dry areas
- provide more veterinary services to control livestock diseases
- improve the roads in remote parts of the NCA so that grain trucks can get there during the rainy season

Government staff of the NCA would like resident Maasai to:

- stop cultivating, and sell livestock to buy grain instead
- maintain extensive patterns of movement to find water and grass for their herds
- stop grazing in the highland forests of the Conservation Area
- stop the practice by some young people of standing along roads to dance and be photographed by tourists for money

For conservation and sustainable natural resources management, ecological and social sustainability must be a key criterion for defining good and bad behavior. Because it is future use or option value that underpins the concept of sustainability, good and bad in this context refers mainly to whether the behavior keeps natural-resource-use options open for the future or closes them because of extinction, resource depletion and degradation, and other kinds of irreversible environmental changes.

What behaviors are ecologically and socially sustainable? An answer to that question is fundamental to deciding which behaviors should be changed and which maintained, but it is not always easy to answer. Understanding sustainability requires both ecological and social knowledge, and our knowledge of both ecosystems and social systems is imperfect and incomplete. Research and monitoring may be needed to determine whether or not a given practice is sustainable. Such research and monitoring may require trained social scientists and ecologists, but often a basic understanding of sustainability can be developed in a participatory way with rural people, by looking at social and ecological trends (see Figs. 6, 15, and 16, for examples).

Local people often have sophisticated indigenous knowledge of their natural resources and how to manage them, knowledge that, when investigated, often proves to be quite ecologically sound and scientific. On the other hand, outsiders' views of what behaviors are sustainable are sometimes naive and misinformed. For example, local people in Senegal lop off the branches of live trees and use them as fodder or to dress their fields. This practice is illegal, yet local people know from long experience that it is sustainable. Lopping branches does not kill the tree, but stimulates new growth if done properly. The practice conserves grass and grazing land; it protects soil from erosion and helps maintain soil fertility. According to Karen S. Freudenberger, a rapid rural appraisal specialist, "Often, local peoples' knowledge of and interaction with their local environment are more sophisticated and environmentally sound than outsiders'. Villagers may engage in illegal (presumably bad) behaviors (e.g., lopping tree branches in the Sahel) that are actually more ecologically sound than the behaviors mandated by the law."

Why Focus on Critical Behaviors?

Judith Graeff and co-authors (Graeff, Elder, and Booth, 1993) suggest that to narrow the field of potentially relevant behaviors to a few critical behaviors to target, practitioners and their community partners should consider:

- the impact or importance of the behavior to the problem
- the feasibility of changing or maintaining the behavior
- whether the ideal behavior, or close approximations, already exist in the community

In the health sector, they explain, "There are several reasons why communicators should establish a short list of behaviors to promote. First, behaviors related to desired health practices are frequently too numerous and complex to introduce, change, and maintain all at one time. Second, some behaviors are more easily changed than others; some behaviors are simply not feasible for the target audience to perform, and others are incompatible with social and cultural norms. Third, some behaviors have more potential impact on the health problem" (Graeff, Elder, and Booth, 1993).

It should be mentioned here that we have looked to the health sector for models and lessons because a great deal of work has been done on understanding and influencing health-related behaviors. However, we should point out that the kinds of behaviors important in the health sector may be somewhat different from the behaviors relevant to natural resources management. Some possible differences involve the following:

- *Locus of impact:* The negative impacts of unsustainable natural resource use can be diffuse and impersonal. The potential effects of environmentally destructive behaviors, such as global climate change, the extinction of individual species, or widespread loss of biodiversity, are often difficult to imagine or visualize because they have no precedent in people's experience.
- *Time scale:* The effects of environmental behaviors may appear only after a long time lag or may appear gradually. Future generations may bear the costs of some environmental behaviors while the benefits accrue primarily in the present. Understanding and influencing behaviors affecting those processes may be more difficult than changing behaviors whose causes and effects are more obvious and immediate.
- *Locus of action:* Sustainable natural resource management often requires community action as well as individual action. Understanding and influencing individual behavioral motivations may not be sufficient.
- *Degree of controversy:* Solutions to problems caused by environmentally destructive behaviors are often controversial, and consensus is rare. This is true in part because of scientific uncertainty about the long-term environmental effects of some widespread behaviors.
- *Availability of alternatives:* Sustainable alternatives and options have not been developed for some widespread behaviors that affect the environment; for example, substituting fossil fuels for firewood, which has been done in the developed countries, is not a sustainable alternative.

Because of such differences, models and lessons from the health sector may require modification and adaptation for use in conservation and natural resources management.

Focusing on critical behaviors can be thought of as “playing the elimination game” (Graeff, Elder, and Booth, 1993) or visualized as using a series of sieves to screen rocks out of dirt. Of all behaviors that influence natural resources and conservation, the ones with the largest positive or negative impact can be identified. Those can then be screened on the basis of how feasible it is to change or maintain them, and the most easily influenced selected. Considering whether the ideal behavior, or something like it, is already being practiced in the community has an important bearing on how feasible it may be to influence it. Mata (1992) discusses a similar methodology for selecting behaviors to target.

One complication in this process arises because for some behaviors, such as building terraces to conserve soil, the problem might be solved if 75 percent of farmers build terraces. For other behaviors, like rhino poaching, a very small number of poachers can decimate the resource even if almost everyone else supports rhino protection.

Another complication is that some behaviors may be very important because of their impact on the sustainability of a resource, but also very resistant to change. Others may be relatively easy to influence but not very important because their impact on the resource is not great. In choosing which behaviors to target, practitioners must make pragmatic judgments about how to weigh those factors.

Lack of knowledge can complicate such judgments. It may not always be clear which of sev-

eral behaviors is more important to sustaining the natural resource base in the long term, or which behaviors are more easily influenced. More ecological or social assessment and research may help to answer such questions, but uncertainty can never be eliminated completely. For example, at Lake Nakuru no studies of the effect of untreated sewage or sediment from soil erosion on the lake ecosystem have been carried out, so no one really knows how serious a threat to the lake they are. Those interested in maintaining the lake can only speculate that sewage and sediment will affect the lake's ecology sooner or later. Careful ecological studies could help rank such potential ecological threats to the lake.

In the absence of sound information about ecological impact, prioritization might be dangerous and misleading; one practitioner suggested that in this case the wisest strategy is to treat all threats as equal and try to address them all until more information about relative impact can be obtained. But because of resource limitations, practitioners may have to focus and prioritize their activities in the absence of complete information about ecological impacts.

Careful social assessment might provide a better understanding of whether it would be easier to reduce soil erosion or improve sewage plant functioning. The feasibility of maintaining or changing a specific behavior is determined by the kinds of social factors that influence it. For this reason it may not be possible to complete the selection of critical behaviors to target until some understanding has been developed of the factors that motivate various potentially critical behaviors.

Focusing on Specific Behaviors

Focusing on specific, rather than general, behaviors is an important tool for identifying critical behaviors. At Dzanga-Sangha National Park

in the Central African Republic, for example, a natural resources manager may initially believe that hunting is a behavior that must be changed to prevent the depletion of local wildlife. A closer examination may reveal that it is the use of wire snares by commercial hunters rather than the traditional hunting methods of forest pygmies that is leading to the decline in animal numbers. In Madagascar, staying out of a nature reserve may not be the critical behavior to maintain, but rather it may be critical to prevent cutting, burning, or grazing cattle in the forests of the reserve. Entering the reserve to engage in sustainable practices, such as gathering of medicinal plants and guiding tourists, could be compatible with conservation.

Emphasizing the Positive

Taking a positive view, and emphasizing opportunities rather than problems—looking for sustainable behaviors to maintain, promote, and enhance, rather than unsustainable practices to change—is probably an underexploited approach to conservation and natural resources management. The goal of such a positive approach would be to identify the sustainable behaviors people are already practicing—to look for what is right rather than what is wrong. For example, a rapid rural appraisal carried out in Senegal provides a number of excellent examples of traditional practices employed by farmers to conserve and regenerate natural resources, including fallowing, crop rotation, spreading manure on fields, rotating cattle among fields at night to fertilize the fields, cutting firewood in a certain way from certain tree species to encourage resprouting, and carefully protecting certain tree species when fields are plowed (Freudenberger and Freudenberger, 1993). These behaviors reflect indigenous knowledge about the sustainable management of natural resources in that environment and they should be supported and maintained in the interest of sustainability.

Behavioral Flexibility

Behavior can be thought of as an adaptive, flexible tracking mechanism that people use to cope with a dynamic, ever-changing environment. Not recognizing this flexible, adaptive nature of behavior “may lead to an overly static interpretation of what is happening,” according to Karen S. Freudenberger. She warns that during the assessment stage there may be “... a great tendency to take a snapshot of behaviors at the time the research is taking place and to respond to that snapshot” in planning activities to influence behaviors. To guard against that tendency, practitioners should keep the dynamic, flexible nature of behavior clearly in mind. A suite of behaviors can make up a livelihood strategy or

“coping-strategy,” and be motivated by the desire to minimize risks (Mace, 1993; Mwangi and Perrings, 1993).

Behaviors used for coping during times of crisis were identified during a rapid rural appraisal study in Senegal (Freudenberger and Freudenberger, 1993). The coping behaviors included eating wild leaves, trading “neow” fruit—a wild fruit—for millet, selling chickens, cutting branches for animal feed, and practicing domestic and international migration. The matrix of historical trends in Figure 6 shows how those coping behaviors changed during the past 50 years, as a response to stresses and crises of various kinds.

Figure 6. Behavioral Flexibility for Coping with Social and Ecological Crises in a Senegalese Village

| STRATEGY \ CRISIS | WW II 39/45 | LOCUST INVASION 1950 | FIRE IN VILLAGE 1967 | DROUGHT 1973 | RAT INVASION 1976 | 2 nd LOCUST INVASION 1988 |
|---|----------------|----------------------------|----------------------------|-----------------|-------------------------|--|
| Eat New Tree Fruit | ••• •• | •• •• | •• | •• • | •• • | • |
| Eat Wild Leaves | ••• •• | ••• •• | • | • | • | |
| Eat Murioc | ••• •• | ••• •• | | | | |
| Eat Dugoor Tree Fruits | •• | | | | | |
| Food Aid | ••• •• | •• •• | •• •• | •• •• | •• •• | • |
| Cultivate and Weave Cotton | •• •• | •• •• | | | | |
| Eat Millet Bran | ••• •• | •• •• | | | | |
| Hunting | ••• •• | •• •• | •• | | ••• •• | |
| Eat Cowpeas | ••• •• | ••• •• | •• •• | •• | •• | •• |
| Dig trenches against locusts | •• • | ••• •• | | | | |
| Trade New fruit for millet | ••• •• | ••• •• | •• | •• | • | |
| Sell Chickens | ••• •• | ••• •• | ••• •• | ••• •• | ••• •• | ••• •• |
| Rural → Rural Urban Migration | | | | ••• •• | ••• •• | ••• |
| International Migration | | | | ••• •• | •••• •• | ••••• •• |
| Sell loose animals → buy food for strong | | | •• • | ••• •• | •• • | •• • |
| Buy flour | | | | ••• •• | | |
| Cut branches for Animal feed | | | | ••• •• | | |
| Eat Own Animals | ••• •• | | | ••• •• | | |

Source: Freudenberger and Freudenberger, 1993, p. 32

UNDERSTANDING THE KEY FACTORS THAT INFLUENCE BEHAVIORS

After the decisions, actions, and practices that are the most critical to maintain or change have been identified, the next step is to understand the determinants of, motivations for, and influences on critical behaviors. Before anyone can effectively influence behaviors, it is necessary to understand why individuals, organizations, and communities take certain actions, make certain decisions, and engage in certain practices that affect the environment; to explore a range of factors that could influence or motivate critical behaviors, and to understand which perceived benefits and barriers are the key ones.

Questions to ask about why people do what they do include the following: What social and ecological factors determine, motivate, or influence the critical behaviors identified in the previous step of the assessment process? Which of those factors are most important? Which are easiest to influence? Which factors could be influenced at the local level? Which factors would require work at the national or international levels to influence?

The problem is that the number of social factors that could potentially affect a given target behavior is vast, and the factors are interrelated in complex ways. How can practitioners sort it all out? In discussing its use of social assessments, for example, The World Bank stated: “Given the range of social factors which might be considered, social assessments must be selective and strategic, and provide information for decision making” (World Bank, 1994). A number of techniques may help sort out this complexity, including using checklists of potentially important factors; research on what the actors themselves perceive to be the benefits of, and barriers to, critical behaviors; and developing causal webs or wiring diagrams of social systems.

Potentially Important Factors

One way to try to understand what key factors influence, motivate, or determine critical behaviors in a given situation is to consider all factors that might be important because they have been found to be important in some other cases. Lists of potentially important factors are not exhaustive, of course, and furthermore, since they are part of a system in which components are interrelated, any such list is somewhat arbitrary. Potentially important social factors to consider include the following:

- knowledge
- values
- social norms
- sociocultural factors
- options
- skills
- economics
- laws
- policies
- gender

Potentially important ecological factors include the following (Noss and Cooperrider, 1994; Smith, 1992):

- photosynthetic productivity
- diversity (within-habitat, between-habitats)
- variability of physical environment (e.g., climate, seasonality, daily periodicity)
- history of disturbance, resilience, successional stage
- competition

Checklists of such factors could be used by practitioners to help them systematically consider the possibilities. Checklists may be useful tools; they can help organize information gathering at this step. Decision tree or flow dia-

gram techniques based on such lists are described in Chapter IV, and an example is shown in Figure 20. Such methods can potentially help identify the most relevant and important factors in each case.

A large body of literature describes methods for social impact assessment, which often uses checklists of potentially important social factors (Finsterbush, Ingersoll, and Llewellyn, 1990; Freudenberg, 1986; Geisler, 1993; Hough, 1991; Interorganizational Committee, 1994). Social impact assessments are usually done by teams of trained social scientists. The social assessments used by the World Bank, described in Box 4, are an example of this kind of approach.

The complexity of the web of social factors that could potentially affect conservation behaviors makes understanding the key factors a very difficult task even for professional social scientists. In real situations it is hard to know where to start. Developing an understanding of the key factors that influence a behavior is even more difficult for conservation practitioners, most of whom are not trained in social sciences. One experienced field manager said, “Many behaviors share multiple causes and most causes are linked to multiple behaviors. Trying to disentangle the web is a major challenge—one which our field-level practitioners, both national and expatriate, are having difficulty addressing.”

Box 4. World Bank Social Assessments

The World Bank has recently developed a process it calls "social assessment" for bringing social analysis into its operations. Social assessment is described as “the systematic investigation of the social processes and social factors that affect development impacts and results... Social assessment (SA) is a process which supports participation and makes explicit the social factors that affect development impacts and results.”

“There are many social factors which need to be taken into account in development operations (gender, ethnicity, social impacts, institutional capacity). In the past these factors have generally been analyzed separately, with the result that some issues received attention while others were overlooked. Social assessments provide an integrated framework for deciding what issues have priority for attention and how operationally useful information can be gathered and used.”

The Bank’s note on social assessment lists six types of “social factors affecting poverty, participation, and project success”:

- Demographic factors
- Social diversity
- Socioeconomic determinants
- Social organization
- Sociopolitical context
- Needs and values

In terms of methods, “Social assessments use a variety of data collection and analysis methods from the social sciences ...” and “involve consultation with stakeholders and affected groups and other forms of data collection and analysis.”

Source: “Social Assessment: Incorporating Participation and Social Analysis into the Bank’s Operational Work”; Note from the World Bank, Environmental and Social Policy Division (ENVSP), May 10, 1994 (World Bank, 1994).

Perceived Benefits and Barriers

One approach for trying to cut through the potential complexity of social systems in order to understand behaviors involves going first to the actors themselves and trying to understand their decision making. This approach asks them—albeit indirectly sometimes—why they do what they do, rather than assuming anything about their motivations. This pragmatic approach has been developed and used extensively in social marketing (see Chap. VI). The idea is to determine what the actors themselves see as the benefits of, and barriers to, a given behavior (Middlestadt, et al., 1993; Middlestadt, Smith, and Bossi, 1993; Smith, 1994). “A benefit is what is motivating, desirable, rewarding, or pleasant about a behavior people now practice—what the actors think they gain from a behavior they now do, or think they will gain from

changing their behavior. A barrier is what people think is or will be difficult, unpleasant, or undesirable about adopting a different practice” (Middlestadt, Smith, and Bossi, 1993).

The terms “benefits” and “barriers” attempt to distill the complex array of factors that might influence a given behavior into a more understandable, relevant set of key factors. This approach can lead to surprises; the social factors assumed to motivate a given behavior by social scientists or development experts may not be the same as the benefits and barriers actually perceived by the actors themselves. Understanding the actors’ perceptions can sometimes quickly open avenues for creative problem solving, as examples of the use of this approach in the health sector have shown (see Box 5).

Box 5. Understanding Behaviors: Examples from the Health Sector

An approach that emphasized understanding and influencing behavior was used in Guatemala in a campaign to reduce the incidence of diarrheal diseases by increasing the use of a community water system (Graeff, Elder, and Booth, 1993). An interdisciplinary team identified many behaviors that linked use of the water system to reductions in diarrheal diseases, but eventually selected hand washing by mothers as the key behavior on which to focus. Direct behavioral observation, individual interviews, and focus groups provided information about the perceived benefits of, and barriers to, hand washing by mothers. It was clear that mothers knew that they should wash their hands to prevent the spread of diarrheal diseases, and could do so properly; therefore, the low rate of correct hand washing was not due to knowledge or skills barriers. Other motivational barriers to hand washing were then explored. Direct behavioral observation showed that, far from being a simple behavior, correct hand washing actually needed forty-six steps to perform and took two minutes in the conditions of a Guatemalan village. If women washed their hands correctly each time it was required for proper sanitation, they would spend nearly one hour each day washing their hands and would have to carry an additional jug of water from the village tap to their homes each day! Handwashing was so costly in terms of time and labor that the barriers outweighed the perceived benefits in most cases. Reducing the time and trouble needed to wash hands was obviously the kind of intervention needed to increase the frequency of the behavior.

Another example comes from a project designed to increase immunization rates in Honduran children (Graeff, Elder, and Booth, 1993). The first step toward a solution was to recognize that the problem was not just that few mothers were bringing their children to the clinic for immunizations overall, but that very few were bringing them back after the first shot to complete the full immunization series. The project therefore focused on a key behavior: increasing repeat visits to the immunization clinic. A survey showed that mothers had sufficient knowledge about the need for and timing of immunizations; the barrier to behavior change was not lack of knowledge, so other motivational factors were involved. Direct behavioral observation of interactions between health workers, mothers, and children showed that health workers were often impersonal, insensitive, and even impolite to both mothers and children. "It could be expected that the mother would feel punished by this experience and be less likely to return to the clinic or recommend the experience to her neighbors." In this case intangible interpersonal benefits and barriers were at work, and improving the interpersonal communication skills of workers at the immunization clinic was obviously needed to increase repeat visits. To change the behavior of mothers, training in interpersonal communication for health workers was the logical intervention to adopt.

In both of these cases, preliminary assessment and research showed that lack of awareness and knowledge were not the reason that diarrheal diseases were common and immunization rates were low. Without knowing this, health promoters might have designed education and communication campaigns to increase knowledge of the causes of diarrheal diseases, the techniques of correct hand washing, or the need for immunizations and the recommended timing for them—without effect. Ineffective interventions were avoided, and effective ones developed, because of simple social research that helped provide an understanding of the perceived benefits and barriers that influenced hand-washing and immunization behaviors.

Any of the potentially important factors listed above could act as benefits and barriers. Each is discussed briefly below.

Knowledge

Sometimes lack of knowledge or awareness of the negative environmental consequences of a decision, practice, or action is a barrier to the adoption of more sustainable behaviors. Environmental educators often make this assumption, sometimes without testing it through adequate assessment and research, before proceeding with activities designed to increase knowledge and awareness. If people know about the negative consequences of their behavior but do it anyway, other motivational factors must be at work.

Values

Even if people know about the environmental consequences of their behavior they may not consider those consequences undesirable because of their values (see Chap. I). They may not value some of the nonmaterial uses of ecosystems or nonhuman species, for example. Knowledge may influence values in some cases. If people do not know about some of the indirect material benefits of natural ecosystems—the life support and ecosystem services benefits—they may not recognize their value. Knowledge may be needed to allow some values to be expressed, and in some cases knowledge has been shown to influence expressions of values such as attitudes and opinions (Byers, 1988).

Social Norms

Social norms are another important category of benefits and barriers. Practitioners can determine whether social norms are functioning as a benefit or barrier by asking people who they listen to, whose opinion they care about, and

who they turn to for advice and support, and then determining how those key individuals or opinion leaders behave. Social norms often relate to social status and respect. In Madagascar, for instance, if a respected traditional spiritual leader says that killing lemurs is bad, that can influence behavior. If a rich and popular village leader made his money from slash-and-burn cultivation in mountain forests, his behavior could set a norm that may influence other people's actions.

Sociocultural Factors

Sociocultural factors such as traditions, customs, beliefs, and taboos can play significant roles in influencing natural resource management behaviors (see Box 6). In many cases sociocultural factors are closely related to values, which were discussed above. Omari (1990) discusses the importance of many of these sociocultural factors in African societies, and describes a general “reverence for natural resources” in many cultures. For example, in Ghana and throughout much of Africa, people conserve certain forest areas because they view them as “sacred groves” (Dorm-Adzobu, 1991). In Madagascar, sociocultural factors such as taboos and beliefs are important motivations in not killing lemurs and maintaining large cattle herds for funerary sacrifices, behaviors which clearly influence natural resources.

Options

People may know that a practice has negative environmental consequences, and also hold values that would lead them to change their behavior, all else being equal. But they may have no options, alternatives, or opportunities or they may lack the resources to take advantage of such options. Sometimes options are provided by technology, such as new crop varieties, water pumps, terracing techniques, or

electric fences. Other options may be social, such as new forms of governance or tenure, or new laws and policies. Lack of options can act as a barrier to behavior change.

Skills

Skills are an important category of benefits and barriers (Middlestadt et al., 1993; Middlestadt, Smith, and Bossi, 1993). Actual and perceived skills have been shown to be a key determinant of environmental behavior (Hungerford and Volk, 1990). Lack of skills, whether actual or perceived, may be a barrier to behavior change. If a new behavior requires technical skills, training, or practice, people's fear of failing or embarrassing themselves may be a barrier to its adoption. On the other hand, having skills, or the perception of being able to do a certain behavior, can empower people to take action (Hungerford and Volk, 1990).

In Madagascar, for example, villagers may not have a number of skills—such as language ability—needed for guiding tourists interested in birdwatching or botanists searching for potentially useful plants. This lack of skills may act as a barrier to adopting those new practices. Villagers do know how to practice slash-and-burn cultivation and make charcoal, however, and these familiar skills motivate them to maintain practices that may be unsustainable. At Lake Nakuru, Kenya, lack of skills may be a barrier to adoption of some of the new behaviors that the practitioners working with the integrated conservation and development project there would like them to adopt, including planting living thorn fences, small-scale dairying, and terracing to reduce soil erosion.

In the Honduran immunization example discussed in Box 5, the health workers' lack of interpersonal communication skills was a barrier to getting mothers to bring children to the immunization clinic after the first visit. A parallel exists in natural resources management and conservation. If conservationists or natural resources managers lack skills in communicating and working cooperatively with local people, that lack may create a motivational barrier to the adoption of the conservation and management behaviors those practitioners are promoting.

Economics

Direct, tangible material values and uses are what are typically thought of as economic benefits. Direct material benefits are extremely important factors, because they often fill basic subsistence needs (see Table 1). As was discussed in Chapter I, however, direct material benefits represent only one category of the diverse values and uses of natural resources. Indirect material benefits and nonmaterial benefits—both of which are often not given a monetary value or traded at all, although they often could be—also motivate natural resource management behaviors. An example comes from Nepal, where social research showed that the assumption that the attitudes of local people toward a wildlife refuge would be related to their economic costs from wildlife damage to crops was false (Heinen, 1993). In fact, their attitudes were correlated mainly with sociocultural factors, especially religion.

Some people assume that decisions about natural resources are based primarily or solely on such direct material, or economic, incentives and disincentives. That assumption often leads them to minimize or ignore the importance of other kinds of factors. Practitioners working with economic development organizations are perhaps especially prone to assume the primacy of economic motivations for behavior.

Research on traditional livelihood strategies and production systems has often shown that the decisions of those who follow them are not motivated primarily by the kinds of short-term, material, market-oriented values that many modern economists believe in. Risk aversion and minimization and long-term security may be more important factors (Mace, 1993; Mwangi and Perrings, 1993). Such research suggests that “... the objectives of peasant households ... not only extend beyond economic (production) goals, but that such economic goals may be a strictly subsidiary part of household objectives” (Mwangi and Perrings, 1993). Traditional livelihood practices may be motivated far more by the desire to reduce long-term risk than for short-term economic gain.

Laws

Laws can provide both incentives and disincentives for influencing behaviors, although it is the disincentives for unsustainable practices—in the form of fines, prison sentences, and other kinds of physical threats up to and including death—that most people think of first. Legal disincentives are sometimes effective at changing behavior, and sometimes not. Sometimes laws provide incentives for unsustainable practices. Sometimes people do not know the law or do not respect it. Legal factors meant to influence behaviors then interact with other factors such as knowledge, values, and social norms, as was the case with the law against killing marine birds on the Quebec North Shore

(Box 2). In such a case, education and communication may be needed to allow laws to act as incentives or disincentives as intended.

Because legal benefits and barriers are often economic (e.g., tax breaks, fines) or have economic implications (e.g., prison sentences), people may make an economic decision when deciding whether to obey a law or not. In some cases, the potential for positive economic benefits from breaking the law is a stronger motivation for behavior than the potential legal disincentives, leading some people to make a conscious, rational decision to disobey the law. This sometimes appears to be the case with rhino and elephant poaching, for example (Leader-Williams and Milner-Gulland, 1993), where the value of illegal wildlife products is high, and fines or the risk of jail sentences is relatively low.

Policies

Policies, like laws, can act as both benefits or barriers in influencing behaviors. Also like laws, they sometimes have the effect desired by the policymakers, and sometimes they do not. In Namibia, for example, the national government is trying to promote a reduction in the killing of roan antelope and other threatened species. Barbara Wyckoff-Baird, a community participation specialist with the World Wildlife Fund’s Living in a Finite Environment (LIFE) Project in Namibia, explained the situation: According to Namibian wildlife law and policy all wildlife, including roan, belong to the national government, not to the residents of the communal lands on which many of these animals live. Roan are quite valuable if captured alive for the live animal market—much more valuable alive than dead in economic terms. A man in the Otjozondjupa Region, in the Kalahari Desert in eastern Namibia, explained why he might shoot a roan if he saw one, however. If he shoots it, he will get the meat for his family.

If he lets it go, the next person who sees it may shoot it for its meat, or government game wardens may capture it and sell it for a lot of money, none of which will go to him. He and his family will benefit only if he shoots it. Wildlife law and policy thus leads to an incentive for individuals on communal lands to kill roan for meat. In a March 1995 policy reform designed to change this incentive, the government stated its intention to give the residents of communal lands use rights to animals on those lands, on a quota system set up by the government. Communal area residents could then capture roan alive, sell them, and divide the profits among the community, theoretically providing an incentive to capture rather than kill these antelope. The legislation needed to implement this new policy is not yet in place, however, so for the time being the temptation for individuals to kill roan remains.

In Mali, where the forestry code makes all trees the property of the national government, a similar kind of logic may work to discourage tree planting by individual farmers. Although individuals may still gain some benefits from trees they plant on their land, they are not entitled to all the benefits they might receive if they “owned” the trees they planted and grew on their land according to Abdoulaye Dagamaissa, a Malian forester.

Gender

Men and women often perceive and use natural resources differently, so gender is an important factor to consider in any attempt to understand the social and ecological context of behavior vis-à-vis the environment. “In many developing countries, women are the primary managers and users of natural resources. Yet, gender is an often overlooked element in agriculture, water, and forestry programs and projects. Gender analysis increases our understanding of the gender-based division of labor, indigenous knowledge, resource access and

control, and participation in community institutions with respect to natural resource management” (Thomas-Slayter, Esser, and Shields, 1993). Figures 10 and 12 give examples of how simple, participatory tools of social research can provide important information about gender-based differences in natural resource use.

Multiple Factors

Complex mixes of factors, rather than one single factor, often motivate behaviors, of course. Since communities are not homogeneous, different factors can motivate the same behavior in different people. A full understanding of behavioral motivations is probably impossible, but some level of understanding is necessary for planning effective activities to influence behaviors. An example from Zimbabwe’s CAMPFIRE program, discussed in Box 6, illustrates the complex, changing mix of benefits and barriers that can influence conservation behaviors.

A Few Complications

Perhaps the major complication with the benefits and barriers calculus is that costs and benefits of a given behavior may be apportioned to different actors (individuals or groups). For example, the economic benefits of killing a rhino for its horn may go to a few poachers; the costs may be distributed among all citizens of a country, whose revenues from wildlife tourism are reduced when their rhinos become extinct. Or, the costs may be borne by a small group—farmers on the border of a national park whose crops suffer wildlife damage, for example—while the benefits are distributed among another group of stakeholders, such as owners of and workers in the ecotourism sector. It may sometimes be true that the benefits flow to the present generation (from unsustainable cutting of a forest, for example), while the costs are passed on to future generations.

Yet another kind of complication arises because many of the factors that influence behavior are structural, that is, the locus of decision making is at a higher level in the political hierarchy. Laws and policies, often made at the national level, are good examples. Economic factors, which are often determined at the national, regional, or even international level, are another example. Some scholars and practitioners even express the view that policies, macroeconomics,

and other structural factors are the main influences on behaviors at the local level. Such structural barriers cannot be easily addressed at the community or project level. In such cases, understanding the importance of structural factors can help practitioners and communities recognize that they have to work to influence national or even international actors to develop sustainable natural resources management at the local level.

Box 6. Benefits and Barriers in Zimbabwe's CAMPFIRE Program

CAMPFIRE is an acronym for “Communal Areas Management Programme for Indigenous Resources.” During the colonial period and even after Independence, all wildlife in Zimbabwe were legally the property of the state. The key to the later development of the CAMPFIRE program was a national policy change that granted the authority for some district-level governments to manage and receive benefits from the wildlife in their districts (Metcalf, 1994).

Professor Marshall Murphree is Director of the Centre for Applied Social Sciences at the University of Zimbabwe, which provides social analysis and applied research for the CAMPFIRE program. He said that in Zimbabwe in general and the CAMPFIRE program in particular, it is generally assumed that economic motivations for behavior are primary. These economic motivations are either to meet basic subsistence needs or to improve the standard and quality of individual and community lives. “We’re accused of being economic cowboys in our policies here,” he said.

Professor Murphree recognizes that economic motivations may not be primary in all cases, however. Emmanuel Kawadza, a Senior Ecologist in the Department of National Parks and Wildlife Management, said that based on his experience giving talks in villages about the values of wildlife, the “ethical value of wildlife is the strongest.”

Professor Murphree makes some important points about behavioral motivations for conservation. For one thing, “different cultures and ecologies throw up different configurations of behavioral motivations.” For another, behavioral motivations change over time. As an example, he mentioned that in one of his first speeches in Masoka village (now a successful model of the CAMPFIRE approach), he told people “You realize these animals are worth money!” They responded with derisive laughter, because to them at that time, wildlife “were nothing but a nuisance, good, if at all, only in the pot!” Now, through CAMPFIRE, they realize they can earn money from them, and their motivations for conservation have changed.

Professor Murphree also said that recently the safari hunting concessionaire at Masoka asked the village for permission to develop a new hunting camp at an especially attractive place. The villagers were reluctant to grant permission because that place had been consecrated by the spirit mediums—an offering had been buried there, and it was considered a sacred place. The village asked for advice from some members of the CAMPFIRE Association, who suggested that if it would help them earn money, they should grant permission for the new camp. After deliberation, however, they decided *not* to give their permission; in making this decision, nonmaterial sociocultural benefits outweighed material economic ones.

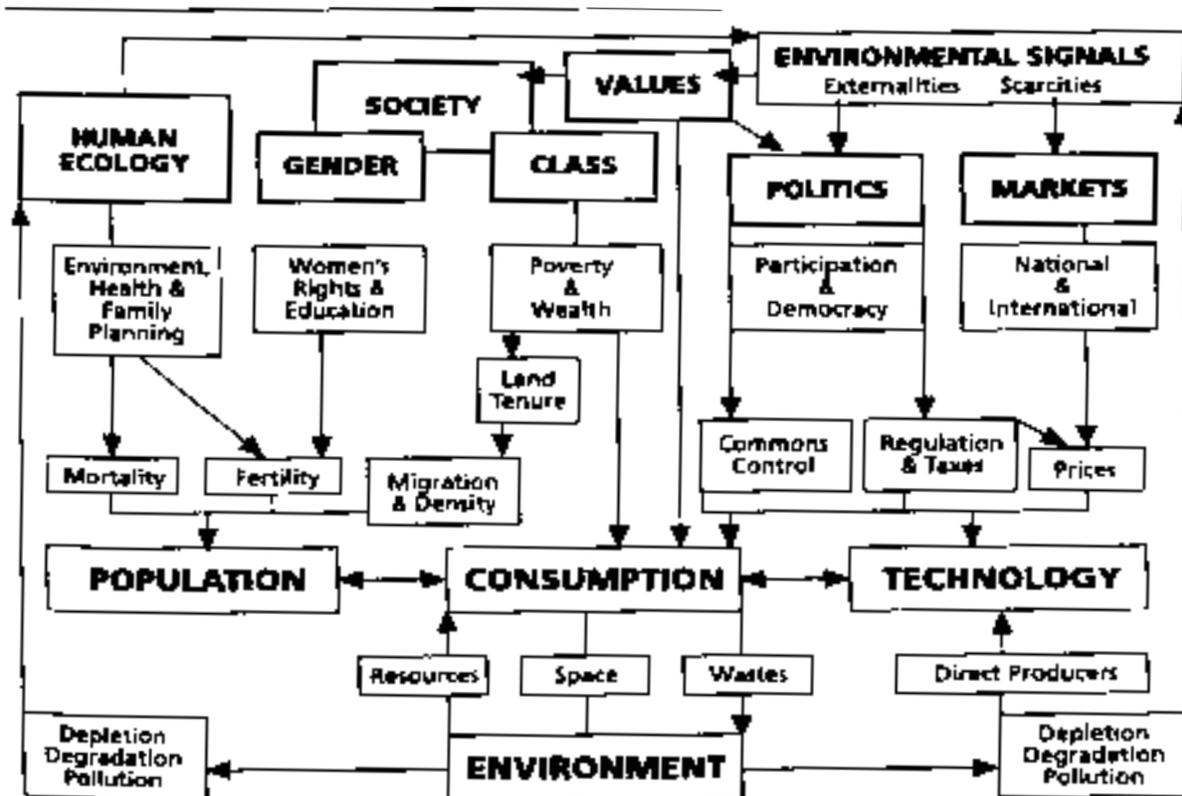
Lately, Professor Murphree said, “Political self-assertion is coming up as one of the principal motivating factors in what they are doing at Masoka,” and some decisions may be motivated by that, as much as or more than by money.

Causal Webs or Wiring Diagrams

Models or diagrams, such as “causal webs” (Miller, Shinn, and Bentley, 1994) or social “wiring diagrams” (Harrison, 1993), have been used to conceptualize social and ecological factors and their linkages. Because social factors are part of a system, and are all interrelated, any such model is arbitrary to some degree. Models may nevertheless be useful as tools for

conceptualization and information gathering, just as are checklists of potentially important factors. One such social wiring diagram is shown in Figure 7. The boxes interposed between Consumption and Environment in this diagram—labeled “Resources,” “Space,” and “Wastes”—form the behavioral interface shown in Figure 1. It is human behaviors, after all, that use resources, take up space, and produce wastes.

Figure 7. Diagram of Social System Components and Their Environmental Linkages



Source: Harrison, *The Third Revolution*, 1993, p. 268

IV. Methods and Tools for Social Assessment and Research



BACKGROUND

Next we turn to a brief review of some methods and tools of social assessment. We present this review because during our interviews and field work we learned that many field practitioners and managers are not aware of the wide range of methods and tools they could be using, especially participatory ones, although some are already using various methods such as surveys, community meetings, and participatory rural appraisal. This lack of awareness seems to be due in part to the lack of an active communication network among practitioners interested in the human and social aspects of conservation and natural resources management.

Some scholars and practitioners express the view that only trained social scientists can, or should, do the social assessment needed to plan, implement, and evaluate conservation activi-

ties, projects, and programs. Many practitioners and communities, however, lack the resources to hire trained social scientists to provide all, or even some, of the social information they need. We believe that conservation practitioners and natural resources managers can benefit from learning some basic methods and tools of social assessment.

Although there are many methods and tools for gathering social information, these are not sufficient by themselves. As discussed in the previous chapters, information-gathering methods alone do not provide a conceptual framework for setting goals and objectives, designing and implementing activities, and evaluating the effectiveness of those activities. The combination of a process for understanding and influencing behaviors, like that described in the previous chapters, with methods and tools for gathering information is needed.

METHODS AND TOOLS

This chapter is meant only as an introduction to the wealth of information available about methods and tools of social assessment and research. It provides a summary or sketch of some key methods, and cites some of the relevant literature that should be consulted for more details about each. Of course, this brief review can in no way substitute for actual field experience.

There are several reasons for knowing and using a wide range of methods. No single technique is universal enough to be successfully applied in all situations. Choosing the best method depends upon the goal, the situation, and the participants. Because participation is an essential ingredient of effective conservation and natural resources management, participatory methods of social assessment are necessary, not optional. Using a wide range of methods can help practitioners better understand which factors influence critical behaviors, including sometimes-neglected sociocultural factors.

Every method has its own biases, which can be overcome by using a diversity of methods (Freudenberger and Gueye, 1990). Together the various methods “provide different information which is mutually enriching. Thus, when possible, it is better to select techniques that are complementary in that they provide crosschecks and new information” (Whyte, 1977).

Some of the methods and tools reviewed below are for information gathering only. Others, however, work as analytical tools at the same time; they set up a simple analytical framework while gathering information. Quantitative matrices, such as those shown in many of the figures in this chapter, do so, for example. When

these methods are participatory, they give people a framework for analyzing the information they are compiling themselves—often an empowering experience!

Knowing and using a wide range of methods for getting information can help practitioners and their community partners avoid problems of several kinds. Some methods of social research are time consuming and expensive, and if not used properly they may not give practitioners and communities the information they need to make decisions, thus wasting time and money. A flawed design or poorly done statistical analysis may invalidate the results of a survey and lead to bad decisions. Community meetings, if not carefully planned and facilitated, may increase tensions between outsiders and the community or increase polarization within the community itself. Social research can also raise false expectations. By doing so, it may increase polarization and make open explorations of options less likely by suggesting solutions prematurely. For example, during our field work we saw a questionnaire used by the staff of a government agency that asked villagers, “Do wild animals damage your crops?” It then asked, “What do you think the government should do about this problem?” Such a question raises expectations that the government might do something, when in fact government managers may be unwilling or unable to act on the problem.

Literature Review

Although the most up-to-date, relevant information about the social context of a conservation situation will probably come directly from people themselves, and be gathered using a combination of the methods and tools mentioned below, such primary research is often slow and expensive. Before undertaking such

information gathering from primary sources, practitioners should try to find and make use of any information that has already been gathered. Such secondary research can provide an introduction to the social and ecological context of a situation for those not already familiar with it or it can broaden the perspectives and challenge the assumptions of those people who are already familiar with the situation. Secondary sources can provide a historical understanding of the social and ecological context—of changes and trends over time. It can help practitioners develop questions and hypotheses to be addressed by direct information gathering. Such secondary research can save a lot of time and expense and is an opportunity that should never be passed up. The literature on topics relevant to natural resources management and conservation in many parts of Africa, and elsewhere, is extensive. Universities, government agencies, and individual scholars and researchers are all potential sources of the kind of secondary information that could be tapped by practitioners working to foster conservation.

Surveys and Questionnaires

Surveys and questionnaires can be used to gather information about behaviors and the knowledge, skills, and other motivational factors that influence them. Survey questions can range from highly structured ones, with acceptable answers restricted to a few choices such as “agree” or “disagree,” to open-ended questions in which possible answers are not suggested, such as “What is your opinion of...?” Each type of question has advantages and disadvantages; question choice depends on the kind of information needed. Some examples of the types of survey questions that have been used to learn about conservation and natural resources management behaviors in Africa are given in Box 7.

Developing good survey questions requires field-based knowledge. Pretesting the questions on a small sample group and revising ambiguous or problematic questions is a crucial step. An example from the Ngorongoro Conservation Area in Tanzania shows the local knowledge and sensitivity needed to develop good survey questions. According to Patricia Moehlman, a Wildlife Conservation Society representative in Tanzania, “You can shape or even create attitudes by the questions you ask.” As an example she cites the Maasai attitude toward malignant catarrhal fever, a disease transmitted from wildebeest to cattle, causing cows to lose calves. Long aware of this fact, Maasai have traditionally grazed their cattle away from wildebeest during the calving season. If, however, a researcher asks the Maasai if the disease “is a problem for them,” it may suddenly be placed in a new category. Where once the disease was seen as a fact of life, it is now seen as a problem.

Surveys can be administered in writing or orally. With written questionnaires, the respondent can remain anonymous. When questionnaires probe sensitive issues, respondents may be more willing to give more honest answers. An example would be a questionnaire administered by a government agency that asks villagers whether they have ever engaged in illegal behaviors, such as hunting or cutting trees in a national park. Written questionnaires are not useful in areas with low literacy rates, of course. With oral administration, on the other hand, the interviewer knows who the respondent is. In such cases, the level of trust between interviewers and respondents is a key consideration in assessing the accuracy of survey results. Feuerstein (1986) and Rugh (1992) offer many practical guidelines for preparing survey questions and administering surveys.

Box 7. Examples of Survey Questions

Closed or Forced Choice

Is there any crop damage by wild animals in this village? () yes () no () don't know

There is no need to keep areas of natural forest. () agree () disagree () undecided

When was the last time you ate game meat? () this year () last year () year before last

How do you participate in natural resources management in your area?

- a) as a member of village natural resource committee
- b) in patrol work
- c) in hunting
- d) in management planning

Scaled

Cultivation by residents of the Ngorongoro Conservation Area should be allowed.

- () strongly agree
- () agree
- () undecided
- () disagree
- () strongly disagree

Semi-open

What do you do when wild animals raid your farm?

- a) shout to scare wild animals to run away
- b) confront the wild animals with spears, bows and arrows, sticks, pangas, etc.
- c) report to the village Game Scouts
- d) guard crops day and night until harvesting
- e) do nothing
- f) other _____

What are the benefits of living next to Tsavo National Park?

- a) provides water
- b) built a classroom
- c) transport
- d) grazing
- e) none
- f) other

Open

What things are happening to the natural resources of your village/area that you do not like?

If Tsavo West National Park could do one thing to make life in your village better, what should it be?

What benefits would you like to get from the park (list according to priority):

- a) _____
- b) _____
- c) _____
- d) _____

Sources: African Wildlife Foundation, 1993, "Knowledge, Attitudes, and Practices Survey," unpublished survey; Katalihwa, M. 1993. "A Preliminary Assessment of Attitudes and Values Pertaining to Conservation among the Human Communities around Mkomazi Game Reserve, Tanzania." Unpublished project proposal; Mkanda, F.X. and S.M. Munthali, 1993. "Public Attitudes and Needs Around Kasungu National Park, Malawi." Unpublished report; Miriam O-Zacharia, Tanzania Wildlife Department, personal communication.

Most surveys done in Africa concentrate on demographic and socioeconomic variables and on practices. Few of the questionnaires we examined asked about potentially important factors other than direct material benefits and other economic factors.

Surveys and questionnaires can provide information about the diversity within communities. The actual or relative anonymity of some types of surveys encourages people to express views they might not express in public. Women, for example, may give truthful answers on a survey but hide their real opinions at a meeting

that includes men. When this information is made public, or used in a participatory process, it can educate community members about community diversity. Information about community diversity can help to structure more representative participatory processes (Schindler, List, and Steel, 1993). A survey used by the Tanzania National Parks (TANAPA) and African Wildlife Foundation (AWF) as a tool to better understand the communities they work with, and to open channels of communication between park managers and local communities, is described in Box 8.

Box 8. Tanzania National Parks/African Wildlife Foundation Knowledge, Attitudes, and Practices Survey

In the past several years, Tanzania National Parks (TANAPA) has been working with the African Wildlife Foundation (AWF) to develop ways of involving local people as partners in conservation. To open channels of communication between park managers and local communities and to better understand the communities involved, TANAPA and AWF developed a Knowledge, Attitudes, and Practices Survey. The survey's objective was to gather basic information about socioeconomic and other factors affecting natural resource management practices. The survey included questions such as:

- What do you dislike about what's happening to the natural resources of your village/area?
- What are the benefits of having wildlife in your area?
- If people hunt in your area, why do they hunt?
- In what ways do you use wildlife traditionally?

Once the initial data were collected, meetings that involved a broad spectrum of the community were held to discuss the issues and problems the survey identified. Meeting organizers tried to avoid traditional meeting formats, such as straight lines of chairs and tables for notables, to encourage contributions from all participants. Simple "dialogue event sheets" were used to provide a record of the meeting. The survey has given TANAPA and AWF a reason to visit and revisit communities, thus building rapport and credibility.

Source: Edmund Barrow and Patrick Bergin, African Wildlife Foundation and Tanzania Community Conservation Project, P.O. Box 48177, Nairobi, Kenya.

Comparing the results of an initial survey with the same survey administered later can be a useful tool for evaluation. The Quebec marine bird and Brazil golden lion tamarin conservation examples described in Boxes 2 and 3 used surveys for impact evaluation in that way.

Direct Behavioral Observation

Direct behavioral observation is another useful method for understanding behavior. One of its advantages is that it preserves the holistic nature of the behavior being observed and its complex interaction with the environment (Thomas-Slayter, Esser, and Shields, 1993). It provides direct evidence for behavioral steps, antecedents and consequences, rather than indirect information via self-report methods like surveys and questionnaires (Graeff, Elder, and Booth, 1993). “The direct observation of behavior complements assessment via self-report in several ways.... Although each session is labor intensive, observational research uses small samples, which generally require less time and fewer resources than other research methods. As a result, small observational studies are often used in conjunction with other data-gathering techniques as a validation of survey data or as a way of teasing out elements of a complex set of interactions” (Graeff, Elder, and Booth, 1993).

A number of types of behavioral observation, including performance observation, narrative recording, frequency recording, duration recording, and behavioral products observation, can be used (Graeff, Elder, and Booth, 1993). Simple checklists, prepared in advance, help in all of these types of direct observation.

In the Guatemalan hand-washing example discussed in Box 5, it was direct behavioral observation that showed how complicated and time consuming correct hand washing actually was in a village setting. Direct observation provided

the clue to understanding the motivational barriers that had to be lowered in order to increase hand washing by mothers. In the Honduran immunization example also discussed in Box 5, health practitioners carefully observed a number of interactions between immunization clinic workers and mothers and their children, and described what they saw in simple notes. This technique of “narrative observation” provided the initial clue that a lack of interpersonal communication skills in clinic workers was creating psychological barriers to return visits. After hypotheses about potential benefits and barriers have been formed using narrative observation, more quantitative techniques such as frequency or duration recording can be used if necessary (Graeff, Elder, and Booth, 1993).

Participatory, or participant, observation involves accompanying people as they carry out everyday activities, such as hoeing and weeding, gathering firewood and carrying water, searching for medicinal barks and roots, cooking and cleaning, caring for children, protecting crops from animals, hunting and trapping, and constructing shelter—or even actually taking part in those activities. This participatory observation can help practitioners and other community members learn things about behaviors that they would not have thought to ask (Thomas-Slayter, Esser, and Shields, 1993). Actually taking part in an activity or doing a behavior can give a better understanding of its benefits and costs than watching others do it (see Box 9). The participant observation method is often blended with an informal interview, with questions being asked and answered as they arise during the course of the activity.

According to Lazaro Ole Mariki, a Maasai staff member of the Ngorongoro Conservation Area Authority, participant observation is the most useful method for understanding the needs of local people. On visits to local communities, he eats and sleeps in the villages and helps with

whatever manual labor needs to be done. He sometimes accompanies Maasai herders as they drive cattle to salt licks and water points.

Observation is sometimes more effective than self-report methods like surveys and interviews because it can more easily avoid asking direct questions. For example, rural people sometimes do not know the names of the plants they use, according to Mark Auslander, a social anthropologist who has worked in Zambia, so one cannot ask direct questions about those plants and their uses. Participating in plant collecting with community members may reveal that they nonetheless recognize the plants and know their uses.

Interviews

Interviews are one-on-one conversations or question-and-answer sessions. People with special knowledge of, or roles in, key natural re-

source management practices are often interviewed to tap their knowledge and perceptions. Depending on the issue and situation, these people may be well-to-do and respected community leaders or poor and marginalized individuals, men or women, outsiders or local residents.

Practical tips about how to interview effectively are given by Feuerstein (1986) and Freudenberger and Gueye (1990), including how to develop an interview checklist, interview protocol, and how to ask good questions. Freudenberger and Gueye (1990) recommend a semistructured interview process, in which the interviewer knows what topics he or she wants information about, but doesn't prepare a list of structured questions in advance. "Instead of formal, prepared questions, semistructured interviewing uses a checklist to guide the interviewers through the topics they wish to address.... With semistructured interviewing you make up

Box 9. Observing and Understanding Ngoni Hunting

Mark Auslander, a social anthropologist who has done research in Zambia, describes how participant observation can yield important insights:

"In the early months of my field research in Ngoni communities in southern Chipata District in eastern Zambia, I often heard Ngoni men speak at great length about their dry season traditional hunts, when they would ostensibly bag great quantities of game using spears, throwing clubs, and dogs. Since such stories occupied such a large proportion of Ngoni male conversation, I assumed that traditional hunting provided a significant proportion of dry season Ngoni protein intake. Indeed, in numerous interviews, Ngoni men affirmed that, 'We cannot live as Ngoni unless we hunt. What else would we eat?'

Yet it was only after I participated in several actual hunts that I realized that the physical take was fairly small. A 30 kilometer all-day expedition consisting of 45 men and 200 dogs might only net 20 to 25 kilograms of game meat, principally in the form of hares and large rodents. Nonetheless, such a hunt would still be spoken of as a resounding success by its male participants, and boasted about for months to come. The critical importance of the hunt, I came to learn, lay not in the physical mass of animals slaughtered but rather in three other areas: (a) the demonstrated skill of male hunters in bringing down prey with their thrown clubs; (b) the political prestige realized by redistributing animal parts to dependents; and (c) the re-establishment of royal Ngoni authority over contested lands, where non-Ngoni "squatter communities"—principally from urban areas—had recently settled. The large Ngoni hunting expeditions were largely aimed at intimidating these dispersed squatter communities, and pressuring them to pay tribute to Ngoni chiefs. Game meat was the most prized "food"—as it exemplified male Ngoni warrior identity— but it constituted only a minor proportion of any Ngoni individual's diet."

the questions as you go along and that requires some fast thinking.... Once you begin interviewing on a certain topic, you will begin to probe the issue by asking related questions and trying to deepen your understanding. This is where the interviewer has to be particularly alert as she or he listens to the answer and thinks up what to ask next.... To the informant, a semistructured interview should seem like an informal conversation, with one topic leading naturally into another. Of course, this requires a fair amount of skill on the part of the interviewer..." (Freudenberger and Gueye, 1990).

Posing direct questions in an interview sometimes has disadvantages, and in these cases indirect questioning techniques may work. Interviewers can use a range of conversational techniques, including reflective listening and hypothetical musings instead of asking direct questions. Instead of asking, "Why don't you people do more deep-sea fishing?" researchers could instead wonder aloud, "I've been wondering how I could fish past the coral reef if I wanted to" or "I heard that people on other islands like to go deep-sea fishing. Is that a good idea?"

As with all methods, researchers should remember that communities are not homogeneous. One can never assume, for example, that men necessarily know what women do, or vice versa. Similarly, elders and youths or rich and poor may not understand each other's activities. Asking members of one subgroup about their perceptions of the behavior of other groups during interviews can reveal stereotypes about behavior that may be important to address as part of a participatory problem-solving or dispute-resolution process.

Focus Groups

"A focus group is a carefully planned discussion held in a permissive, nonthreatening envi-

ronment that is designed to provide in-depth information about how a certain group of people perceive a certain area of interest. Focus group members are led to interact with each other so that they respond to opposing ideas and comments and reveal many facets of a given issue. A focus group is considered a qualitative rather than quantitative research method because the information gives decision makers valuable insights into the target audience's perspectives without providing statistical data" (Moulton and Roberts, 1993).

In practice, a focus group facilitator leads a small group of respondents, roughly six to ten, through an informal discussion of a selected topic. Focus group discussions are repeated with several such groups until little new information emerges. "The moderator uses a prepared list of probing questions to collect information, but at the same time allows discussants to talk freely and spontaneously about the selected health problem" (Graeff, Elder, and Booth, 1993). All participants are encouraged to offer ideas and opinions during this "group interview" process (Thomas-Slayter, Esser, and Shields, 1993).

Focus group participants can be chosen on the basis of membership in organizations, place of residence, gender, age, occupation, or economic status. Focus groups are especially useful for understanding "the diversity of perceptions and opinions found in the community.... Meeting with men and women in separate groups may bring out issues obscured in joint meetings" (Thomas-Slayter, Esser, and Shields, 1993).

"Focus group discussions can clarify the community's level of awareness in regard to resource degradation and can provide a means for gathering baseline data on existing management practices. Discussions can also help community members to understand their own roles in resource degradation, to recognize alternatives, and to consider collectively the opportunities

and constraints for changing current behavior patterns” (Thomas-Slayter, Esser, and Shields, 1993).

Effective focus groups require skillful facilitation. “The point of a focus group is to elicit sincere responses from the discussants—not correct ones. The unconscious inclination of a facilitator to lead a group in some preconceived direction can be difficult to overcome” (Moulton and Roberts, 1993).

Community Meetings

Community meetings bring together representatives of interested parties to discuss issues and problems. These meetings may bring out important dimensions of behavioral motivations that methods aimed at individuals, such as questionnaires, interviews, and direct behavioral observation, sometimes miss. Community meetings often reveal opinion leaders—people who are respected and listened to by many community members—who can play key leadership

roles in programs to maintain or change behaviors.

Because communities are not homogeneous, practitioners must understand the community’s actors and institutions when deciding who to invite to meetings. Some possibilities include political leaders, religious leaders, other kinds of opinion leaders, women or men, children, or a whole village at once. Separate meetings with each of a community’s many subgroups may be useful. Meetings to consider especially contentious issues, if poorly planned or facilitated, can increase tensions and strengthen divisions in communities rather than build consensus. Meeting format and protocol can influence the quality of participation. Bergdall (1993) presents some excellent, practical suggestions for organizing effective community meetings. Some experiments with nontraditional meeting format and protocol used by the Tanzania Community Conservation Project are discussed in Box 10.

Box 10. Community Extension and Outreach in the Tanzania National Parks

Several practitioners in Tanzania are using community meetings as a way to understand and begin to address needs of local people. The Tanzania Community Conservation Project, based at Tanzania National Parks (TANAPA) headquarters in Arusha and sponsored by the African Wildlife Foundation, usually begins its community extension work by meeting with the leaders of communities near parks. According to project director Patrick Bergin, a basic level of trust is necessary before any community meetings can be held, and in some communities this level has not yet been reached. In such cases, trust must be developed using other methods before meetings are held.

After meeting with community leaders, the Community Conservation Project holds larger community meetings. Project staff try to get away from the traditional meeting format of straight lines of chairs for the audience and tables at the front for officials or leaders by mixing up seating in the room. The meeting facilitator prevents anyone from monopolizing the meeting. Whenever someone offers an idea, it is written down. Such changes in meeting format and protocol have resulted in a wider diversity of views being expressed, with community members and junior staff members from TANAPA speaking up in meetings in the presence of senior government officials for the first time.

Mr. Chengulla, the TANAPA Community Conservation Warden at Tarangire National Park, uses another method to identify local issues and problems. He contacts village chiefs and asks them to invite him to village meetings, especially if the meetings will include discussions about wildlife. This method is an alternative to having TANAPA call a community meeting and may have some advantages in terms of encouraging community leaders to take the initiative.

Source: Patrick Bergin and Ezekial Dembe, Tanzania Community Conservation Project, P.O. Box 1300, Arusha, Tanzania.

Mass meetings are sometimes held to elicit local priorities for community development. Because these meetings are often organized by party or government authorities, people in many parts of Africa do not consider them forums for truly democratic participation. The vast majority of people at such meetings may be afraid to voice their honest opinions, desires, and frustrations.

Gender and status are important considerations in planning and facilitating community meetings. Involving women in community meetings is a particular challenge for field practitioners in many parts of Africa. Even when women do show up at large public meetings, they may not speak. Miriam O-Zacharia, a community extension specialist with the Tanzania Wildlife Department, told us that, at a meeting in the Selous area, an unusually outspoken woman pointed out that women are chastised at home by men if they speak frankly at meetings. Even having separate meetings for women does not necessarily solve these problems, since men still interrogate women about what they said once they return home. Because women often fear that their answers will somehow get back to their husbands, they may provide false information.

Maps and Transects

Maps and transects are ways of representing information about ecological and social systems, such as the spatial distribution of natural resources, their uses, and relevant opportunities and problems. Maps take an aerial perspective, while transects take a cut-away, horizontal view of a place. Both of these can be very simple and still contain a large amount of relevant information. They can be produced by local people or by practitioners working with local people, using very simple materials. A patch of smooth sand or soil; a stick for drawing lines in the sand; and perhaps a few stones,

sticks, or leaves to represent houses, trees, or other features are enough. Maps made on the ground can be sketched or photographed later, if a record is needed. Or a large piece of paper and markers for drawing can be used to make the map initially. Sheets of transparent acetate plastic can be used to overlay maps containing different kinds of information. Such low-technology “geographic information systems” can often provide as much relevant information to practitioners and communities as their much more expensive high-technology computer-based counterparts can (see Fig. 8 below and Figs. 12 and 13 in Chap. V for examples).

Calendars

Calendars and timelines are tools for gathering information about how people’s interaction with the environment varies through time, usually through an annual cycle of seasons. Seasonal calendars, for example, show the changing patterns of livelihood activities throughout the year (see Fig. 14). Information about the timing of activities can be gathered using participatory methods such as interviews and community meetings. Information about changing natural resources use over longer time periods can be represented in matrices of historical trends (see below).

Matrices and Contrastive Analysis

Matrices, or two-dimensional tables, are simple tools for organizing information. Rows and columns in the matrix indicate different categories of information (see Fig. 9, for example). This kind of organization automatically provides the basis for contrastive analysis—for comparing something with something else. Contrastive analysis is used to find patterns in the information, form questions and hypotheses, and understand the situation better. The simplest matrices compare two categories or groups—men and women or wealthier and

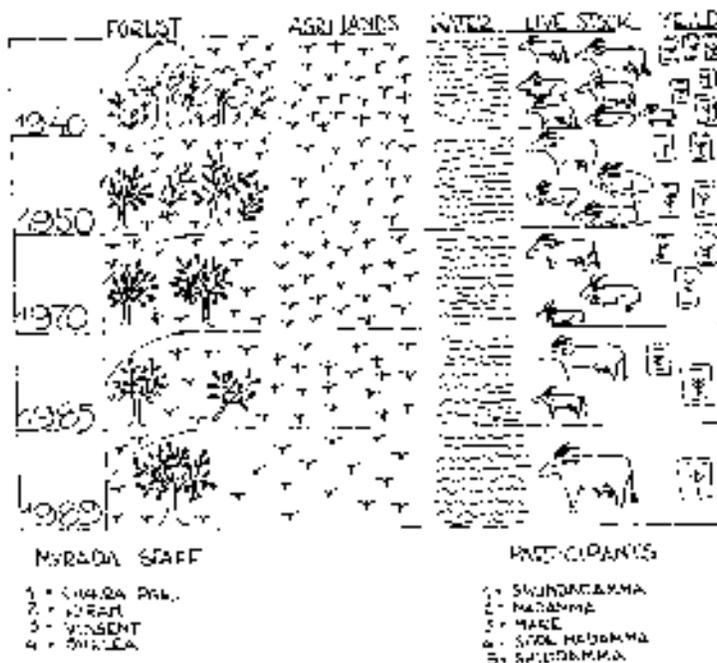
Figure 9. Matrices of Historical Trends in Natural Resources and Land Use

a. From Tsupaneng, Natal, South Africa

| DECADES | TREES | CULTIVATED LAND | FALLOW LAND | GRAZING | WASTE LAND | YIELD PRODUCT |
|---------|-------|-----------------|-------------|---------|------------|---------------|
| 1940 | 10 | 10 | 0 | 10 | 0 | 10 |
| 1950 | 10 | 10 | 0 | 8 | 0 | 10 |
| 1960 | 6 | 8 | 0 | 6 | 3 | 7 |
| 1970 | 5 | 5 | 0 | 5 | 5 | 6 |
| 1980 | 4 | 4 | 7 | 4 | 6 | 4 |
| 1990 | 3 | 1 | 9 | 1 | 8 | 1 |

Source: Participants, 1993, p. 36

b. From Ardanaryapura Village, India



Source: Mascarenhas, 1992, p. 13

Venn Diagrams

Venn diagrams are a kind of conceptual “map” that represents the relationships between social groups, organizations, and institutions, drawn using circles and other shapes of varying sizes (see Fig. 22). Venn diagrams have their origin in mathematics, where they are used to show the overlap in membership between two or more mathematical groups or sets. Like maps and transects, calendars, and matrices, Venn diagrams can be created using participatory methods—in group or community meetings, for example—with very simple materials. Drawing in the sand or making paper and marker drawings are two examples. Venn diagrams “can be used to show which individuals and groups have an influence on decision making, as well as the relations between village institutions and outside forces, such as government services or development agencies” (Freudenberger, 1994). Venn diagrams developed separately by subgroups within the community, such as by men and women or doers and nondoers of a given behavior, can often provide very useful information for understanding behavioral motivations and developing hypotheses about how to influence behavior.

Wealth Ranking

Wealth ranking is a simple method of gathering information about perceptions of socioeconomic status at the village or community level (Freudenberger and Freudenberger, 1993; Freudenberger and Gueye, 1990; Thomas-Slayter, Esser, and Shields, 1993). Key informants are asked to sort cards with the names of each household in the community into piles representing wealth or well-being categories. Comparing the results of the rankings obtained from a number of key informants can give a fairly accurate picture of the socioeconomic situation at the local level.

Prioritization Techniques

A number of techniques can be used as part of a participatory process to rank, prioritize, or quantify importance. A pairwise ranking technique using a matrix format to compare a number of threats to sustainability was used in the Ranomafana National Park area of Madagascar, for example (Fig. 18).

Decision Trees and Flow Diagrams

Decision trees and flow diagrams are tools for systematically asking questions or gathering information. Typically, a question is asked, and depending on the answer to that question—often “yes” or “no”—the tree of questions forks or branches to a pair of questions. Each of these likewise can be answered “yes” or “no,” leading to further branches of the tree (see Fig. 20, Chap. V).

METHODOLOGIES

The methods and tools reviewed above, in various combinations, have been developed for, or combined into, what could be called “methodologies.” Methodologies are approaches to social assessment, each of which uses a suite of diverse information-gathering and analytical tools. Some of these methodologies also involve the planning, implementation, and evaluation of activities, projects, and programs. Several of these methodologies are reviewed below.

Rapid Rural Appraisal

Rapid rural appraisal, or RRA, was developed to fill the gap between highly structured, quantitative methods of social research and the informal, rapid, intuitive assessments of rural situations that are sometimes used by development agencies. “RRA recognizes that a certain amount of rigor is essential in order to have

confidence in the results of a field study and to persuade other people of their validity. But, it also believes that intuition and a certain informality and flexibility are essential to obtaining quality information from the field. Thus RRA offers methodological guidelines intended to improve the quality of information gathered, but it also insists that there can be no ‘cook-book’ guide to its use. Such a crutch would dangerously inhibit the flexibility and creativity which are pillars of the method” (Freudenberger and Gueye, 1990). RRA was developed in part to obtain accurate information at low cost in terms of time and money.

In practice, RRA makes use of interdisciplinary teams that use a range of methods, including a number of those discussed above. Semistructured interviews “may be the only tool used in every RRA” (Freudenberg and Gueye, 1990). RRA typically avoids formal surveys and questionnaires, substituting more qualitative and flexible techniques such as semistructured interviews.

In *RRA Notes to Accompany Introductory Training Module*, Karen S. Freudenberger and Bara Gueye present a list of key RRA concepts, including the following:

- it is a learning process that takes place in the field; information is analyzed as it is collected in the field
- it tries to tap local, indigenous knowledge
- it is iterative; RRA “encourages the team to change its approach and revise its hypotheses” in the field as new information becomes available
- it is multidisciplinary
- it is flexible, innovative, and exploratory
- it strives for rapid results that can inform decisions and actions
- it encourages participation

“Triangulation” is an essential methodological concept in RRA. “...looking at something from only one perspective introduces serious biases into the analysis. If you can introduce two, three, or even four different points of view into your analysis, you will begin to get a more complete and more accurate picture of the situation you are trying to understand” (Freudenberger and Gueye, 1990). The composition of the RRA team can be triangulated by selecting members of different disciplinary backgrounds, both men and women, and both insiders and outsiders—people who know the local situation well from experience, as well as people who do not and so can bring a fresh perspective. Using a diversity of methods can help overcome the biases inherent in any single method. Encompassing all the social diversity present in the situation—learning from both men and women, young and old, well off and poor, for example—is also an important kind of triangulation.

“Optimal ignorance” is another key concept of RRA, according to Freudenberger and Gueye. This is the argument they give for choosing to remain ignorant of some factors that could be studied: “Because the team is trying to get as much useful information as it can in a short time, it is essential that it focus on what is most important—and leave the rest aside. The funny, almost backward phrase, ‘optimal ignorance’ is a reminder that we can’t learn and don’t need to know everything in a brief field study. The team must be willing to remain ignorant in some areas, in order to spend time on other things which are more important” (Freudenberger and Gueye, 1990).

A report on a rapid rural appraisal carried out in Senegal provides a number of examples of how this method can be used to identify and focus on important natural resource management behaviors (Freudenberger and Freudenberg, 1993). The RRA identified many practices farmers used to conserve and regenerate

natural resources, including fallowing, crop rotation, spreading manure on fields, rotating cattle among fields at night to fertilize the fields, cutting firewood in a certain way from certain tree species to encourage resprouting, and carefully protecting certain tree species when fields are plowed. This RRA exercise also developed a list of behaviors used to secure rights of possession to both trees and land.

An excellent source for examples of the use of methods and tools of rapid rural appraisal is *Tree and Land Tenure: Rapid Appraisal Tools* (Freudenberger, 1994).

Participatory Rural Appraisal

Participatory rural appraisal, or PRA, and rapid rural appraisal are closely related methodologies. According to Robert Chambers, “RRAs began as a better way for outsiders to learn. In answering the question ‘Whose knowledge counts?’ they sought to enable outsiders to learn from rural people and to make use of indigenous technical knowledge to assist outsiders’ analysis. Its mode, however, is mainly extractive. Outsiders go to rural areas and obtain data from the local people, bring it away, and process it.... The knowledge of rural people counted but for the outsiders’ use. They were the ones that could carry out the analysis and provide the solution. Recognizing the weakness of leaving this responsibility to the outsiders, PRAs evolved. Outsiders still go to rural areas, but more and more as learners, conveners, catalysts, and facilitators” (Chambers, 1992).

Both PRA and RRA use some combination of the methods and tools reviewed in this chapter. Many of the examples presented in the figures in this chapter and in Chapter V come from either PRA or RRA exercises.

The goal of PRA is to “help rural communities define problems, prioritise project activities, and adopt village-based resource management plans” (National Environment Secretariat, et al., 1990). In practice, PRA is a semistructured process conducted in the field, usually involving a number of steps. First, a PRA team visits the site and holds planning meetings, initially with local leaders, then with other local stakeholders. Such teams are typically multidisciplinary, composed of technical specialists from external institutions such as donors, NGOs, and project implementing agencies. The team gathers information, including simple spatial data, such as sketch maps prepared with local peoples’ help, and time-related data, such as seasonal calendars and trend lines. Household interviews are usually carried out, and a local institutional analysis is done. Visual tools such as maps, trends matrices, and calendars help the team organize information and present it to the community at meetings. The team uses a variety of techniques to help the community define problems, prioritize those problems and the opportunities for solving them, evaluate local capacities for solving them, and prepare a systematic action plan for the community to adopt and implement.

The use of participatory rural appraisal is becoming more widespread, and many excellent sources of information about this evolving methodology are available (Chambers, 1992; Mascarenhas, 1992; National Environment Secretariat, et al., 1990; Program for International Development and National Environment Secretariat, 1989). “While PRA has grown from a research focus ... it has developed beyond that and is used in planning, implementation, monitoring and evaluation of work with communities. PRA can be used at all stages of the project cycle...” (Participants, 1993). Box 11 presents

examples from Madagascar that suggest the need to adapt PRA techniques for use in integrated conservation and development projects. Like rapid rural appraisal, PRA is meant to be a relatively rapid method of assessment. While this speed has advantages, an appraisal that is too quick and superficial may fail to understand the complexities of a community's behaviors. No matter what the methodology, a day or week of research can never produce all the informa-

tion that a month, year, or decade yields. A danger is that people may take the results of rapid appraisals more seriously than they should. Another issue is that building trust and rapport and developing active community participation take time. MYRADA, an NGO working in South India, has reached the conclusion that "'rapid' cannot be 'participatory'" (Mascarenhas, 1992).

Box 11. Adapting Participatory Rural Appraisal for Integrated Conservation and Development Projects in Madagascar

Participatory rural appraisal has been used widely during the planning phase of a number of the large integrated conservation and development projects (ICDPs) being carried out in Madagascar with funding from USAID. PRA originated as a tool for rural development and has not yet been fully adapted for use in integrating conservation and development. It has a predisposition to identify what local people perceive their economic development needs to be without necessarily linking those needs to conservation values and activities.

This seemed to be a problem with the PRA assessments done in the Mantadia-Andasibe complex of protected areas. The residents of the village of Andasibe, for example, listed their priorities as constructing a pharmacy, building a grain storage facility, and acquiring agricultural inputs such as fertilizer and seeds. Such priorities would probably be shared by most other rural villages in Madagascar, even those far from any protected area. PRAs in villages in the Mantadia-Andasibe area elicited no mention of activities that linked development to conservation, such as increasing nature tourism, doing pharmacological prospecting, or protecting forests as watersheds. This is surprising, because the village of Andasibe, for example, is in the prime location to realize benefits from increased visitation to the Andasibe Reserve, where the indri, Madagascar's largest lemur species, can be easily observed. Other villages in the area likewise could benefit economically from increasing nature tourism in the area.

When a donor-funded project asks local people about development needs and problems, their expectations that the project will address those needs and solve those problems are often unavoidably raised. But the purpose of integrated conservation and development projects is not only to foster development—they have an equally strong conservation goal. In some cases there may be conflicts between conservation needs and what local people perceive their development needs to be. Conducting a PRA that focuses only on local development needs may raise expectations and is likely to exacerbate potential conflicts between conservation and development, not to resolve them.

When PRA or other methods are used to understand and address the human dimensions of conservation, conservationists should work with communities to identify sustainable natural resource management practices and linkages between development and conservation, not just to identify development needs and priorities. PRA training activities carried out for CARE in the Masoala and Montagne d'Ambre areas demonstrate an awareness of this need to adapt PRA for use in integrating conservation and development. Those PRA exercises may provide a model for others wishing to use PRA to promote sustainable natural resource management and conservation.

Source: Grimm and Byers, 1994; "Synthesis of PRA Findings in Mantadia Forest Complex," unpublished report prepared for VITA, 1993; "Participatory Rural Appraisal Consultancy Report Presented to CARE Madagascar, 1992. (Both reports obtained from USAID/Madagascar.)

Participatory Research

Participatory research has many affinities with the RRA and PRA methodologies described above. Not only are many of the same information-gathering methods and tools used in these approaches, but they have similar philosophical orientations as well. For example, participatory research emphasizes local people's participation in, and ownership of, the research process and results as do both RRA and PRA. Rapid rural appraisal "encourages researchers to view their informants not just as objects of study, but as participants in the research process. They should be included as fully as possible not only in the collection of information, but also in its analysis, and certainly in providing feedback on the conclusions. RRA is research *with* people, not *on* people" (Freudenberg and Gueye, 1990). Research, writes Anne Whyte (1977), is something that should be "equally shared between researchers and researched."

"Participatory action research" (PAR), one "school" of participatory research, is "a process of research, education, and action conducted by a community of relatively powerless people in collaboration with specialized researchers. Its goal is to generate new understandings that guide the community in its struggle for survival, opportunity, and empowerment" (Palmer, 1994). Participatory action research is distinguished from conventional social science research in four ways (Fals-Borda and Rahman, 1991; Palmer, 1994; Park, Brydon-Miller, Hall, and Jackson, 1993):

- Knowledge is pursued as a means of social change.

- Community members as well as those with specialized training are researchers; together, they define, plan, and conduct the research; analyze and evaluate data; and decide what course of action to follow.
- Knowledge can be obtained through both scientific and indigenous methods.
- The research process and products are owned by the community, not outside researchers.

Rapid rural appraisal and participatory rural appraisal have evolved in the direction of participatory action research in the work of an NGO called MYRADA in South India. "What was required was a method which did not stop just at the 'appraisal' but which went beyond it into a shared analysis and understanding of rural situations. This, in turn, should lead to development activities that are creative, productive, and sustainable over a period of time" (Mascarenhas, 1992). MYRADA calls its adaptation of RRA and PRA "participatory learning methods."

Participatory Planning

Participatory planning and decision-making methods involve a diverse group of stakeholders from the very beginning of the planning process. Participatory planning is sometimes called "open decision making." An open sharing of information is required, with the group generating and evaluating alternatives and trying to reach a consensus about a solution (Shands, Sample, and Le Master, 1990). Guidelines for participatory problem solving include the following:

- encouraging frank exchanges among all parties, especially at the beginning before positions harden
- encouraging parties to share information
- identifying opportunities for joint problem solving
- clarifying how decisions are reached by making the decision-making process transparent

The main advantage of this process is that it “gives all participants full access to information and the opportunity to participate in dialogue about and resolution of issues” (Sirmon, Shands, and Liggett, 1993). In the United States, decision makers are required by laws such as the National Environmental Policy Act (NEPA) to share decision making with the public. Jeff Sirmon and his co-authors suggest the relevance of this kind of process: “Controversy and conflict over resource decisions appear to be intensifying. To counter this, we need to find new ways to get people to talk to one another about what they really want from the forests, and find effective ways to engage them in civil dialogue and mutual education about their needs and values” (Sirmon, Shands, and Liggett, 1993). In confronting difficult policy issues, people must struggle with “their orientation, values, and potential tradeoffs.... Only the group—the relevant community of interests—can do this work” (Sirmon, Shands, and Liggett, 1993).

By trying to build consensus about solutions to specific problems, participatory planning highlights true differences of interest or goals. The process recognizes that disputes are inevitable and potentially useful. Meanwhile, it helps to avoid the kind of negative attitudes that top-down management styles sometimes create. It often improves the quality of decisions and so-

lutions by increasing the quality and quantity of information that goes into them. Finally, it can increase all parties’ commitment to solutions, since all parties played significant roles in crafting those solutions.

Some approaches to environmental education merge into participatory decision-making and problem-solving processes. Because these processes require key actors and interested parties to share information and communicate, they naturally include an educational dimension (Bardwell, Monroe, and Tudor, 1994; UNESCO-UNEP, 1985).

Participatory planning does have some drawbacks. One major disadvantage is that reaching a decision can take much longer, and reaching consensus may not even be possible. If poorly designed, participatory planning processes can do more harm than good. Public hearings or debates can polarize communities. The result can be bargaining between rigid positions instead of an exploration of mutual interests and mutually beneficial solutions.

Another problem is that most methods used in participatory planning were developed for literate audiences. Administrators use flip charts or other written records to maintain a “group memory” and to help organize and communicate ideas rapidly, for instance. Methods that allow illiterate audiences to participate are more difficult and less well developed.

An interesting example of one such method is the GRAAP Technique, developed by the Groupe de Recherche et d’Appui à l’Autopromotion Paysanne, a French private volunteer organization based in Bobo-Dioulaso, Burkina Faso (GRAAP, 1988). This group “has devel-

oped an extension education method called the GRAAP Technique, which uses visual images to teach illiterate people and to promote self-help efforts in rural communities. Foresters in several West African countries have used the GRAAP Technique to help rural populations become increasingly aware of the utility of trees and the consequences of desertification on their lives and to promote forestry programs by involving rural people in planning and decisionmaking processes” (Force, Sawadogo, and Dagamaissa, n.d.). A study by Abdoulaye

Dagamaissa found that three-quarters of staff members of the Malian Forestry Service have been trained in this technique, many use it, and almost all “believe the technique motivates villagers to undertake forestry actions” (Dagamaissa, 1990).

Box 12 illustrates how participatory planning methods have been used by Tanzania National Parks (TANAPA) staff in the development of a comprehensive management plan for Lake Manyara National Park.

Box 12. Participatory Park Planning in Tanzania

Tanzania’s Lake Manyara National Park faces threats from an expanding population, demand for land, water diversion for irrigation, and reduced river flow to the park. Tanzania National Parks (TANAPA) decided that the park needed a long-range, comprehensive general management plan to address these threats. As a first step in developing the management plan, TANAPA’s Planning Unit and Community Conservation Service launched a participatory planning process that encouraged the input of local communities.

First, TANAPA assigned a community conservation warden to initiate contacts and establish dialogue with district leaders. Then TANAPA used its Knowledge, Attitudes, and Practices Survey to survey local people about the park, park staff, wildlife, natural resources, hunting, tourism, community development, and other issues.

Next, TANAPA held workshops with community leaders to discuss the survey results and establish constructive dialogue with the community. Participants included village officers, traditional leaders, women, merchants and businessmen, fishermen, and Maasai pastoralists. Participants generated lists of problems and issues, discussed and prioritized them, and proposed solutions to the most pressing problems. The TANAPA Planning Unit then summarized the results of the survey and workshop, and drafted a management plan.

Community conservation staff continue to participate in the planning unit’s core workshops, taking proposals from the draft management plan back to the original workshop groups for local leaders’ reactions and comments. Because the community was able to share its views from the very beginning, the final management plan is expected to meet the needs of local communities more effectively.

Source: Patrick Bergin, Tanzania Community Conservation Project, P.O. Box 1300, Arusha, Tanzania; Bart Young, Tanzania National Parks (TANAPA), P.O. Box 3134, Arusha, Tanzania.

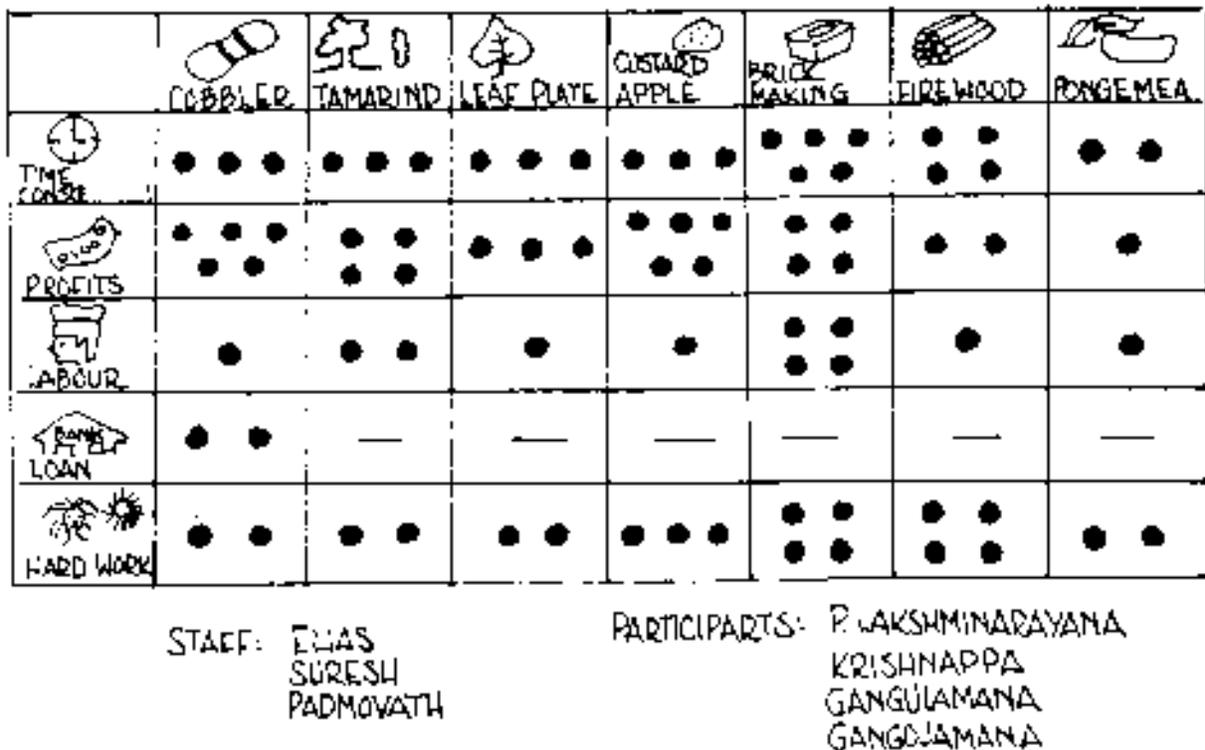
Box 13. Comparing Doers and Nondoers to Understand Perceived Benefits and Barriers: An Example from the Health Sector

An example in which doers and nondoers were compared to understand perceived benefits and barriers to condom use comes from a study on "Understanding Women's Prevention Behavior," carried out as part of the USAID-funded AIDSCOM Project. Katherine Carovano and Susan Middlestadt compared Tanzanian women who said that they always use condoms (doers) with those who don't (nondoers). Doers and nondoers differed significantly in their knowledge of the effectiveness of condoms in preventing HIV infection. They also differed significantly on four measures of "perceived self-efficacy"— their perceived ability or skill in doing a specific behavior, in this case getting their partner to use a condom. Perceived self-efficacy was evaluated by whether the women said they "know how to" actually use condoms, discuss using condoms with their partner, force their partner to use condoms, and refuse to have sex if their partner doesn't use a condom (Carovano and Middlestadt, 1993). These differences show that both knowledge and skill factors are acting as barriers to behavior change in this case. This understanding leads quickly to ideas about interventions that could lower those knowledge and skill barriers and thereby influence behavior.

Matrices can also be used as tools for comparing the costs and benefits of various activities.

An example from a village in India is given in Figure 21.

Figure 21: Quantitative Matrix of Costs and Benefits of Income-Generating Activities in Godavellagudda Village, India



Source: Mascarenhas, 1992, p. 16

VI. Promoting Sustainable Behaviors: Planning and Implementation



BACKGROUND

This report has focused primarily on the assessment and research stage of the process of understanding and influencing conservation behaviors because we found that too often conservation projects have started implementing activities without careful attention to assessment. Only when at least some assessment and research has been done can conservation practitioners plan appropriate and feasible actions. Planning involves matching available resources (money, people, time, etc.) with activities and actors to influence the factors that motivate critical behaviors (see Fig. 4). Using resources to carry out activities with actors is the implementation stage of the process.

Although planning and implementation are not the main focus of this report, this chapter will give some examples to suggest how an understanding of the context and motivations of behaviors provided by assessment can be used to design and implement activities aimed at influencing those behaviors. Different kinds of activities are needed depending on which factors are key determinants of critical behaviors. A decision tree technique, like that shown in Figure 20, can be used to select strategies for affecting the key factors that influence critical behaviors, as identified in the assessment stage of the process.

A number of general types of activities, each of which is most appropriate for influencing one or several of the factors that motivate behavior, will be discussed below:

- influencing knowledge, values, and social norms: education, communication and social marketing approaches
- influencing sociocultural factors: education, communication, and social marketing approaches
- influencing options and skills: extension, training, and technical assistance
- influencing economic factors: enterprise development, markets, and incentives and disincentives
- influencing laws and policies: legislation and policy reform

Dispute resolution is also discussed in this chapter. When stakeholders differ widely in their values, interests, and views about what should be done, resolving disputes may be the most appropriate and feasible thing to do, at least as a first step. In those situations it may make more sense for conservation practitioners to support a process of resolving natural resources disputes, rather than an educational campaign or new enterprise development scheme.

A framework or typology of activities for influencing behavior, based on research in behavioral science in the past two decades, is described by Dwyer, et al. (1993). They argue that such a typology is needed because the research they reviewed suffers from “lack of a clear organizational framework for studying the applicability of behavior-science techniques to the complex domain of environmentally relevant behavior.” Their typology differs somewhat from that used here. It categorizes activities according to whether they change “antecedent conditions” that affect behaviors, such as information, goals, and commitment, or “conse-

quence conditions” such as rewards and penalties. They also conclude that while many activities appear to influence behaviors for short periods, much more research is needed on how to make behavior change more permanent. Behavioral psychologists have found, for example, that while it is often possible to achieve short-term behavior change with the use of incentives such as monetary rewards or disincentives such as fines, such behavior change isn’t very durable. It often disappears if the incentives or disincentives are removed (De Young, 1993). Examples of the use of a behavioral science framework to guide interventions in the health sector are described by Fishbein and Middlestadt (1987, 1989) and Fishbein, Middlestadt, and Hitchcock (1991).

To influence behaviors, practitioners and communities must design activities that somehow lower the barriers to sustainable decisions, practices, and actions or that raise the benefits of sustainable behaviors or that do both. As mentioned in Chapter II, it may be useful to think of activities for promoting sustainable behaviors as a kind of exchange or transaction. The inputs and activities of one group of stakeholders, the promoters of sustainable natural resources management and conservation, are exchanged with other stakeholders—natural resource users, policy makers, or other environmental actors—for behavior maintenance or change. Natural resources managers and conservationists could be thought of as producers of certain values and benefits that are exchanged for something from other stakeholders. This concept of behavioral exchange is well developed in the field of social marketing. As stated, one of the fundamental assumptions of our study is that people behave in ways they perceive to be in their own best interest. Thinking of activities aimed at influencing people’s behavior as transactions or exchanges is a way of respecting them while still trying to influence what they do.

In the planning and implementation stages of the process, it is useful to remember that taking a positive view and emphasizing opportunities rather than problems is an underexploited approach to conservation and natural resources management. Practitioners should look for sustainable behaviors to maintain, promote, and enhance, not just unsustainable practices to change.

It is also important to remember that complex mixtures of factors, rather than one single factor, often act as benefits and barriers to motivate a given behavior. Moreover, since communities are not homogeneous, different actors perceive different mixtures of benefits and barriers for the same behavior. The problems of multiple factors and of complex mixtures of benefits and barriers usually means that no single strategy or activity will be sufficient. Practitioners and communities seeking to promote environmentally sustainable behaviors may, therefore, have to plan and implement activities to affect several kinds of factors that influence behavior. Recognizing the need to influence several factors based on adequate assessment is very different, however, from taking a “shotgun” approach to changing conservation behavior, in which a spectrum of activities ranging from environmental education to economic incentives and legal and policy reforms are automatically planned.

INFLUENCING VALUES, KNOWLEDGE, AND SOCIAL NORMS

“The ultimate aim of education is shaping human behavior.” Hungerford and Volk, 1990

Environmental and conservation education is often viewed as one of the main ways to influence people’s behavior toward the environment

and thereby solve natural resource management problems. Most integrated conservation and development projects have an education component. Many of the practitioners this report seeks to serve are using environmental education and communication strategies, broadly defined, in their efforts to foster sustainable practices.

The Limits of “Information-Only” Environmental Education

In some people’s view, the primary role of environmental education is to convey information and improve knowledge. Such an information-only view of environmental and conservation education has not been sufficient, in many cases, to create good natural resources management practices because it is based on the assumption that knowledge is the key factor determining behavior. Those with this view assume that programs to teach people about the problems caused by deforestation would lead them to stop cutting trees and start planting them. Giving people new information, however, does not necessarily change their behavior. In the complex and often difficult situations in the real world, especially in poorer regions, this strategy often did not work. People sometimes were aware of the problem and knew they should not cut trees, but they needed more land for growing food crops and fuel for cooking their food, and had no alternatives. So they cleared forests despite their knowledge, because other motivating factors were overriding.

Most environmental educators have recognized the inadequacy of the simplistic assumption that giving people more information will automatically influence their behavior. Throughout the world, however, it is still easy to find examples of environmental and conservation education programs based on such an assumption.

Modern Environmental Education and Communication

Modern environmental education recognizes that environmental behaviors are influenced not only by knowledge, but also by values, options, skills, and many other motivating factors (Hungerford and Volk, 1990; Wood and Wood, 1990). Modern environmental education attempts, therefore, to communicate more than just knowledge. It is “a process that enables people to acquire knowledge, skills, and positive environmental experiences in order to analyze issues, assess benefits and risks, make informed decisions, and take responsible actions to achieve and sustain environmental quality” (North American Association for Environmental Education, 1993). Another way to describe the goal of environmental education is “to motivate people to implement solutions to environmental problems” (Wood and Wood, 1990). Modern environmental education is concerned with communicating environmental values and ethics, not just knowledge and information (Caduto, 1985). A recent article in the UNESCO-UNEP Environmental Education Newsletter, titled “A Universal Environmental Ethic: The Ultimate Goal of Environmental Education,” illustrates this important trend (UNESCO, 1991).

Harold Hungerford and Trudi Volk (1990) synthesized recent research on environmental behavior and found that the research suggests three main kinds of factors contribute to behavior change:

- “entry-level” factors, which include environmental sensitivity, awareness, and knowledge of ecology
- “ownership” factors, which include in-depth personal knowledge of, and personal “investment” in, environmental issues

- “empowerment” factors, which give people the sense that they have the power and skill to act in ways that will resolve environmental issues

Entry-level factors appear to be prerequisites for making sound environmental choices. Environmental sensitivity, described by Hungerford and Volk as “an empathetic perspective toward the environment”—in other words, perhaps, a strong general sense of environmental values—is a somewhat troublesome factor for many traditional educators because this sensitivity does not seem much affected by formal environmental education. Instead, developing environmental sensitivity seems to require contact with, and positive experiences in, natural environments over long periods of time, according to Hungerford and Volk. They note that knowledge of ecology, while apparently a prerequisite for sound environmental decisions, “does not, in itself, produce [sound] environmental behavior.”

Ownership factors are related to personal relevance, understanding of, and identification with, environmental issues. Economic benefits or costs can make certain environmental issues very relevant to individuals, but so can other kinds of less tangible environmental values.

Empowerment factors are crucial in influencing environmental behavior, and one of the best predictors of behavior is “perceived skill in using environmental action strategies.” Such skills are fairly easy to teach, but they are “often neglected in educational practice” (Hungerford and Volk, 1990). A person’s belief that he or she will experience success in carrying out a certain action is related to empowerment. Of course, such a belief is reinforced by the actual experience of success.

Finally, Hungerford and Volk recognize that what they call “situational factors”—the many other factors that can potentially act as behavioral benefits and barriers—interact with the entry-level, ownership, and empowerment factors to determine environmental behaviors.

Hungerford and Volk critiqued current environmental education methods in light of those research findings. They found that most environmental education focuses almost exclusively at the knowledge and awareness level, which tends to be ineffective in changing behavior. Too few environmental education programs, either formal or nonformal, “incorporate serious attempts to develop ownership and empowerment in learners” (Hungerford and Volk, 1990). Kathleen Blanchard and Martha Monroe (1990) make a similar point: “Most education programs only provide information in an attempt to change attitudes without regard for social norms, group leaders, communication channels, intrinsic motivations, etc. Actually,

most education programs try to reach such a diverse audience that these elements are rarely identified, known, or manipulable.”

As part of this study we developed a database of USAID-funded projects in Africa with environmental education and communication components, and reviewed their project documents (Biodiversity Support Program, 1994b). We concluded that very few USAID-funded environmental education and communication activities, at least as reflected in project documentation, are making full use of modern concepts of environmental education, communication, and social marketing. They are therefore not likely to be as effective as they could be. A USAID initiative that responds to the need to modernize and diversify its environmental education and communication activities is the Environmental Education and Communication (GreenCOM) Project, described briefly in Box 14.

Box 14. The USAID Environmental Education and Communication (GreenCOM) Project

The USAID-funded GreenCOM project will adapt and apply “a common basic approach in ... education and communication” that “has evolved over the past twenty years and has been found to be useful in applications across sectors” (USAID, 1993c). This behavior-centered approach has been developed most extensively by the Academy for Educational Development, under contract to USAID, in health and child survival (Graeff, Elder, and Booth, 1993; Seidel, 1993; Smith, et al., 1993) and agriculture (Mata, 1992; USAID, 1993b). GreenCOM plans to work with USAID and its development partners to “integrate a range of proven environmental education, communication, and social marketing methods into existing programs to help managers understand and influence the patterns of thinking that lead to positive individual and community behavior.” It aims to promote “critical problem solving and long-range resource planning” through environmental education of both formal and nonformal kinds, and “more rapid, targeted behavior change through communication and social marketing” (Academy for Educational Development, 1994).

If assessment shows that a lack of knowledge is a barrier to the adoption of a new behavior or maintenance of an existing one, providing information is a logical strategy for influencing behavior. In the example of seabird conservation in Quebec discussed in Box 2, initial social assessment showed that a lack of knowledge about laws protecting seabirds was a barrier to reducing the harvest of birds, although economic benefits and social norms also influenced the behavior (Blanchard, 1987; Blanchard and Monroe, 1990). In the case of the golden lion tamarin in Brazil (Box 3), social research likewise showed that lack of knowledge was a barrier to behavior change. As in Quebec, however, economics and social norms were also important factors (Archie, Mann, and Smith, 1993; Dietz and Nagagata, 1995). In both cases, educational activities designed to provide information were logical.

Even if lack of knowledge is identified as a key factor that influences a critical behavior, providing information in a form appropriate for a given audience can be a complex task, requiring further social assessment to be done effectively. Questions about what messages and communication channels to use, for example, must still be answered (Graeff, Elder, and Booth, 1993; Wood and Wood, 1990). An excellent example of an environmental education and communication approach that helped solve a wildlife management problem in a complex cross-cultural setting comes from the Yukon-Kuskokwim Delta of Alaska (Ady, 1994; Blanchard, 1987). In this case, an Interagency Information and Education Task Force played a major role in implementing the Yukon-Kuskokwim Delta Goose Management Plan, which restricted the harvest of several species of geese whose populations were declining. Fifteen diverse case studies of the use of education and communication approaches in international wildlife conservation are described in

Conserving Wildlife: International Education and Communication Approaches (Jacobson, 1995).

Environmental Social Marketing

Environmental educators have learned a lot from the fields of behavioral psychology and social marketing in recent years (Monroe and De Young, 1993). This is especially true of educators interested in the growing field of nonformal environmental education, which typically occurs outside of schools and targets diverse audiences that include adults.

Social marketing can be defined as “the analysis, planning, implementation and control of programs designed to create, build, and maintain beneficial exchange relationships for the purpose of achieving ... the adoption of a social idea, service, or practice” (Archie, Mann, and Smith, 1993). In environmental social marketing the “product” might be tree planting, water conservation, use of terracing to reduce soil erosion, or having fewer children.

Environmental education activities sometimes target a broad audience, such as all primary school students. In contrast, social marketing programs tend to target the specific groups practicing specific behaviors. Broad audiences can be broken into smaller subgroups, or “segmented,” according to a variety of characteristics, including demographics, behavior, or geography (Kotler and Roberto, 1989). Identifying specific audiences and doing thorough audience research makes possible a careful tailoring of messages that directly address the values, beliefs, and needs of the target audience. Audience segmentation and research have been neglected in many environmental education and communication campaigns.

Social marketing makes extensive use of the concept of behavioral “exchange.” Social marketers believe that people will change their behavior when someone offers a benefit they want in exchange for the behavioral change. If social marketing can show that the costs of changing a behavior are less than the benefits, people are more likely to change. Although a social marketing campaign may try to change people’s knowledge, social marketers recognize that transferring knowledge is often not enough of an exchange to change a behavior (Archie, Mann, and Smith, 1993).

Environmental education and communication and environmental social marketing are complementary, not competitive, processes. “Tools that are commonly associated with social marketing may enhance the ability of environmental educators to target their efforts and set realistic goals for themselves, even if the social marketing framework is not adopted intact” (Archie, Mann, and Smith, 1993).

Balancing Short-Term and Long-Term Approaches

Lori Mann suggests that some environmental issues are acute issues, such as the imminent extinction of a species or extremely rapid local deforestation. These are immediate and specific problems in a particular place that demand quick attention and action. Mann suggests that the targeted strategies of social marketing may be most appropriate to address those issues. Other issues, such as the loss of tropical rainforests or the destruction of coral reefs, “may imply a longer time frame, a broader range of behaviors to affect, or a less specific population focus.” These, she suggests, “may be more appropriately addressed with environmental education techniques and materials aimed at certain issues, but not designed for specific populations.” In any case, she argues, practitioners should “choose strategies appro-

priate to different types of issues.” Mann also suggests that it might be possible to “work with large learner populations to give them generalizable skills to apply throughout life with all environmental issues” (Archie, Mann, and Smith, 1993).

Considering a specific case may illustrate some of the complexity of short-term versus long-term approaches. In some African countries extracurricular wildlife clubs for school children have existed since the colonial period. These clubs, it has been argued, change the way children feel about wildlife, and some of these children may make decisions affecting their country’s wildlife decades later when they become adults. In some cases, long-term educational approaches like wildlife clubs may set the stage for sustainable natural resources management later; in other cases, by the time the children grow up to be decision makers, wildlife may be gone.

The synthesis of research on environmental education by Hungerford and Volk (1990) suggests that both long-term and short-term processes have a role to play in fostering environmentally sustainable practices. Long-term activities that develop environmental values and sensitivity are needed, as is education to develop environmental knowledge. But such activities alone are not sufficient. The research strongly suggests that environmental education programs need to reach beyond knowledge and do a much better job of influencing ownership and empowerment factors on shorter time scales. There seem to be some successful methods for doing so.

Most natural resource and conservation issues have both short-term and long-term dimensions. Focusing on only one of those dimensions may not be sufficient. An environmental education and communication program that offers a balance between long-term and short-term

approaches to influencing behavior may ultimately be the most effective. Traditional environmental education has not always been successful partly because it has often emphasized influencing behavior in the long term rather than short term. Developments in environmental education that bring in lessons from psychology and social marketing about influencing behavior in the short term can be viewed as attempts to balance long-term approaches with short-term ones.

INFLUENCING SOCIOCULTURAL FACTORS

Assessment may show that sociocultural factors such as traditions, customs, beliefs, and taboos are keys to influencing critical behaviors. Sociocultural factors are perhaps most closely related to values and social norms, factors that were discussed earlier. Just as for values and social norms, education, communication, and social marketing approaches seem the most appropriate for influencing sociocultural factors. Planning and implementing activities to influence sociocultural factors abound with ethical complications and dilemmas, however.

In some cases, sociocultural factors motivate sustainable decisions, practices, and actions. Omari (1990) describes a general “reverence for natural resources” in many African societies. “The reverence of Africans towards nature and natural places was a religious attitude and practice which, while it developed around the religious thought and history of a particular social group, indirectly served other social functions in the whole community. In the case of shrines and initiation rite centres, taboos developed around the destruction of trees, shrubs, and the sacred places themselves. The forests, certain kinds of trees, animals, and sources of water were preserved in the name of religion.” In Madagascar, taboos and beliefs in some tribal groups are important motivations for protect-

ing lemurs. In Ghana and throughout much of Africa, people conserve certain forest areas because they view them as “sacred groves” (Dorm-Adzobu, 1991). Box 6 gives an example from Zimbabwe in which the identification of a place as sacred influenced a natural resources management decision. In these cases, where sociocultural factors motivate sustainable uses of natural resources, conservation practitioners and communities would want to plan and implement activities to maintain the traditions, customs, and beliefs of the cultural group.

Some actors and stakeholders outside of that cultural group may hold values—of progress, development, or modernization, for example—that put them in conflict with efforts to maintain the traditional cultures. International human rights law, however, generally supports the ethical right to maintain one’s culture.

Sociocultural traditions, customs, and beliefs do not always lead to ecologically sustainable behaviors, however. They may once have motivated sustainable practices in the context in which they developed, but given the rapid changes that have occurred in both the social and ecological contexts of many cultures, that may no longer be true. One possible example mentioned earlier (see Box 1) comes from Madagascar, where conservation practitioners working in some areas would like to change the traditional practice of maintaining large cattle herds for funerary sacrifices. Those cattle do not contribute much to the quality of everyday diets, they argue, but have a large negative impact on the environment.

As has been mentioned several times, we make a fundamental assumption in this report that actors at all levels are behaving in ways they perceive to be in their own best interest, given their social background, their values, and their situation—so the burden of proof lies on those who would seek to change traditional beliefs,

customs, or practices. Cases in which it appears that changing sociocultural factors would enhance sustainability require especially careful assessment and research. And, even if that assessment convincingly demonstrates that sociocultural factors motivate unsustainable behaviors, there are still ethical dilemmas. One consideration has to do with the human right to culture. Another has to do with the systemic nature of culture. Changing a sociocultural factor to influence one critical environmental behavior may lead to other social, economic, or political changes that have even more serious impacts on natural resource sustainability than the target behavior did. Without a perfect understanding of the dynamics of the social system—an impossibility—such sociocultural tinkering can be counterproductive. This is the so-called “precautionary principle” as applied to social systems.

Despite the ethical complexities, practitioners and communities working toward sustainable natural resources management—as actors and stakeholders themselves—will undoubtedly be faced with situations in which they will seek to influence sociocultural factors, just as they will seek to influence values, social norms, laws, policies, and economics, and other factors that motivate behaviors toward the environment.

INFLUENCING OPTIONS AND SKILLS

In many cases it may not be values, lack of knowledge, or social norms that lead to unsustainable behaviors. Assessment and research may instead identify lack of options and alternatives or lack of skills as barriers to maintaining or adopting sustainable behaviors. In such cases, providing viable options through

extension programs or technical assistance, or imparting skills through training, are logical activities for influencing behaviors.

Options and Alternatives

In the hand-washing example discussed in Box 5, assessment suggested that the costs of hand washing to mothers acted as a barrier to increasing the frequency of the behavior. Hand washing required a lot of water, which took time and effort to carry home. Reducing this barrier seemed likely to increase the practice of hand washing, so health promoters introduced a simple hand-washing device originally developed in Africa that dramatically reduces the amount of water needed for hand washing, and thus the amount of time women must spend carrying water home. In this case, a technological alternative was a way to reduce the costs of hand washing and promote behavior change.

Another example comes from the Cheetah Conservation Fund in Namibia, whose work is described in Box 15. Although knowledge, values, and social norms influenced farmers’ behavior toward cheetahs, options and skills also seemed to be important. During the assessment stage of the process used by the Cheetah Conservation Fund, farmers suggested that changing livestock management practices could help reduce livestock-killing by cheetahs. They needed some new options and skills to reduce conflicts between cheetahs and livestock. Consequently, the Cheetah Conservation Fund has worked to teach farmers new livestock management techniques, such as bringing cattle closer to farm buildings for calving. They have also introduced the use of stock-guarding dogs to protect herds from cheetahs.

Box 15. Cheetah Conservation in Namibia

The Cheetah Conservation Fund (CCF) is a nongovernmental organization focused on cheetah conservation. Cheetahs are an endangered species, and Namibia has the largest number of cheetahs in the world— approximately 2,500 individuals, estimated to be about one-fifth of the total world population. Cheetahs eat small game such as springbok, the young of some larger antelope species, warthogs, hares and rabbits, and game birds. Ironically, the best cheetah habitat in Namibia is in the heart of the livestock farming country on the plateau north of Windhoek and south of Etosha National Park. Land here is mostly privately owned by white farmers. In other parts of Africa the main threat to cheetahs is habitat destruction or lack of prey, but in this area the main threat is from farmers shooting or trapping them as livestock pests or because they reduce the amount of game on their land.

From a base on a farm in the area, CCF co-directors Daniel Kraus and Laurie Marker-Kraus are engaged in research and educational activities to help protect cheetahs. “The Cheetah Conservation Fund has concentrated its efforts in working with Namibia’s farmers. Our motto is ‘We Can Live Together,’ and this means preserving the livelihood of the farmers while also securing habitat for the cheetah. The Fund’s approach can be described as multifaceted and involves research, livestock management, and conservation education, with the active participation of the livestock farming community” (*Cheetah Conservation Fund Newsletter*, Vol. 3, p.1, August 1994). Their current radio-tracking research is designed to learn more about cheetah movements and territories. This information, shared with farmers, is invaluable in developing ways to help the farmers co-exist with cheetahs.

The work of the Cheetah Conservation Fund has both long-term and short-term goals. The short-term objective of its program is explicitly behavioral: to get Namibian farmers to stop shooting or trapping cheetahs. Social assessment and research, mainly involving semistructured individual interviews with farmers, provided an understanding of why they now kill or trap cheetahs on their land. This information was used to develop appropriate activities. Farmers themselves suggested three main ways to help reduce cheetah-livestock conflicts: (1) changing livestock management practices in ways that reduce conflicts, (2) managing wild game to provide an adequate wild prey base for cheetahs on farmlands, and (3) increasing awareness and knowledge about cheetahs and how to live with them. The Cheetah Conservation Fund is working to give farmers the options, skills, and knowledge to solve their livestock and game management problems without killing cheetahs. Farmers have started to adopt new livestock management practices that reduce problems, such as bringing cows closer to the farmhouse and checking them more often during calving season, keeping a herder with small stock, and using livestock-guarding dogs or donkeys to protect stock from cheetahs.

Protecting cheetah habitat and populations in the long term is another objective, addressed through more traditional conservation education activities for school children. Through school visits and the distribution of informational materials such as bookmarks, coloring books, and activity sheets, CCF staff give children basic knowledge about the ecology of cheetahs and their conservation status. Much of that information probably reaches their parents, the farmers, as well.

Source: Daniel Kraus and Laurie Marker-Kraus, Cheetah Conservation Fund, P.O. Box 247, Windhoek 9000, Namibia.

Kerr and Sanghi (1992) examine the interaction between technological options and indigenous knowledge and practices. They discuss the factors that motivate indigenous soil and water conservation practices in India and argue that outsiders who desire to promote technological innovations must keep such local logic in mind and incorporate it into the design of the technological options being promoted, or the alternative practices are likely to be rejected by local people.

Skills

In the example of condom use by Tanzanian women and their partners (see Box 13), doers and nondoers differed significantly on several skill-related measures (Carovano and Middlestadt, 1993). In the Honduran immunization example (Box 5), the health workers' skills deficit in interpersonal communication resulted in intangible barriers to getting mothers to bring children to the immunization clinic for repeat visits. In both cases, skills training was a logical way to try to influence behavior.

INFLUENCING ECONOMIC FACTORS

When assessment shows that economic factors are key determinants of decisions, actions, and practices, influencing those behaviors requires activities that change the underlying economic benefits and barriers. Such activities could include development of new enterprises, new markets, economic policy reform, or changes in economic incentives or disincentives. Ferraro

and Kramer (1995) argue that conservation and sustainable natural resources management can be promoted by developing more sustainable enterprises that compete for labor or capital with unsustainable practices or that return a higher value from sustainable uses of resources than from unsustainable ones.

Integrated conservation and development projects, or ICDPs, are one attempt to link economic development and sustainable natural resources management (Brown and Wyckoff-Baird, 1992; Wells, Brandon, and Hannah, 1992). Some ways of linking sustainable natural resources management and conservation with direct material economic benefits are clear. Harvesting sustainable amounts of wildlife, fish, or forest products from an area is one example. Irrigated agriculture made possible by stable flows of water from a protected watershed is another. Income generated from ecotourism and pharmacological prospecting by international drug companies are economic benefits local people can derive from natural ecosystems.

An example of efforts to integrate conservation with economic development is given in Box 16. It describes the work of the Biodiversity Conservation Network, which with support from the United States-Asia Environmental Partnership and USAID, is exploring the role of community-based economic enterprise development in biodiversity conservation in the Asia-Pacific Region.

Box 16. The Biodiversity Conservation Network: An Enterprise-Oriented Approach to Community-Based Conservation in the Asia/Pacific Region

The Biodiversity Conservation Network (BCN) was established in 1992 to support site-specific efforts to conserve biodiversity in Asia and the Pacific region using approaches that are both enterprise-oriented and community-based, and to evaluate the effectiveness of such approaches. Underlying the work of the Biodiversity Conservation Network is a “core hypothesis”: “if a community is receiving sufficient benefits from an enterprise that depends on biodiversity, it will act to counter internal and external threats to that biodiversity.”

The Biodiversity Conservation Network is administered by the Biodiversity Support Program and funded by the United States-Asia Environmental Partnership, led by USAID. BCN provides grants for projects that encourage the development of enterprises that are dependent on sustained conservation of local biodiversity. Ecotourism, both terrestrial and marine, is one of the main types of enterprises being developed with BCN’s assistance. Ecotourism development projects are taking place in India, Indonesia, Nepal, and Papua New Guinea. The other main type of enterprise being developed involves the harvest and sale of nontimber forest products; many of the ecotourism projects in the countries listed above also have nontimber forest products components.

One of the central goals of the BCN program is to evaluate a variety of enterprise-based approaches to conservation, because although “many projects promoting economic activities in areas of high biodiversity claimed to be sustainable, no one really knows what the long-term biological, social, or economic impacts of these projects were on the biodiversity of an area and the local and indigenous people living and working there.” A substantial fraction of the money awarded to BCN grantees will be used for collecting information on biological, social, and economic indicators in order to understand the effects of enterprise development on these systems and to test the core hypothesis mentioned above.

Source: Biodiversity Support Program. 1994a.

When economic needs or aspirations are motivating unsustainable resource use, alternative practices that sustainably meet those economic needs are the obvious solution. This is often easier said than done, however. Many schemes to develop substitutes for overexploited resources, to generate income from other natural resources, or to compensate for loss of resource access have had problems (IIED, 1994). Providing employment for wages is often not a compelling substitute for access to natural resources in rural communities. Alternative practices must serve “a purpose in a community’s livelihood which is similar to the activity forgone. The common practice of comparing different income sources only in terms of their monetary equivalents is often misleading, yet all too common. Compensation must reflect,

first and foremost, what communities feel they are forgoing, rather than some measure determined by external technicians” (IIED, 1994). The unexpected results of the activities implemented in the hypothetical ICDP in Madagascar illustrate this kind of problem (Box 1). The project’s designers had mistakenly assumed that increasing rice production and income from rice sales in local markets would substitute for environmentally destructive practices such as charcoal making and slash-and-burn cultivation of cassava in the reserve. Adequate assessment is needed to understand the economic factors that motivate behaviors before activities that will influence those behaviors in the desired direction can be planned (Ferraro and Kramer, 1995).

In planning activities to influence behavior through changes in economic factors, it is essential to keep in mind that traditional livelihood practices may be motivated more by the desire to reduce long-term risk than for short-term economic gain. This desire has important implications for what kinds of new economic arrangements will be sustainable in a given situation (Mace, 1993; Mwangi and Perrings, 1993).

Developing economic alternatives can influence behavior “provided that the linkage between receipt of the benefit and the desired conservation behavior is clear” (Brown and Wyckoff-Baird, 1992). Often, however, conservation promoters working with a community will identify the development needs and priorities of the community—such as schools, clinics, roads, or access to markets—but not clearly link those priorities with conservation needs and priorities (see Box 11). If a conservation project funded by a foreign donor promises to build a school, a clinic, or a road for a rural village in exchange for protecting a natural forest or local wildlife, there may be no clear link in the minds of local people between conservation and the development benefit. They are likely to think of the money for the school, clinic, or road as coming from the donor, not from the conservation activity—as a bribe for conservation, rather than development through conservation. The problem is that conservation motivated by bribes from international donors is not likely to be sustainable.

Unequal distribution of direct material (economic) costs and benefits within heterogeneous communities can lead to unsustainable behaviors, and it is critical to keep this problem in mind when planning and implementing activities to influence economic factors. “A major cause of unsustainable development is that benefits to particular individuals or groups from overexploitation may be great, whereas losses

are shared broadly by society as a whole. Therefore, a cost-benefit calculation by the profiting individuals usually favors nonsustainable use because those profiting do not bear the true costs. Achieving sustainable development in such cases requires some combination of regulations to govern use of resources and altered economic incentives that internalize total societal costs so that the exploiter must pay for the costs inflicted on the public” (Oriens, 1990). Most commonly it is resource access and tenure issues that underlie this problem. Mwangi and Perrings (1993) present evidence that this kind of problem contributed to the failure of livestock development schemes in Botswana and Kenya.

Omari (1990) laments the loss of traditional values that in many African societies led to a “reverence for natural resources” and hence to their conservation. He attributes much of the unsustainable use or exploitation of natural resources now found in Africa to changes in social and economic values and practices: “African societies are now undergoing great changes due to the impact of Western value systems, especially as they are embodied in Western economic systems. A money economy has not only altered social relations among people, but it has also affected people’s attitudes towards nature and natural resources. Many of the economic activities which seem to threaten the African ecology are done in the name of development. The mismanagement of the environment and the imbalance in the ecological system brought about by modern economic and value systems have led to ‘environmental bankruptcy’ in Africa” (Omari, 1990).

Again, it is important to remember that many of the benefits and values people derive from natural resources are not direct material benefits in the traditional economic sense. Unanticipated problems can develop when practitioners assume, without adequate social assessment, that

such economic motivations are always most important. Such an assumption can lead practitioners to ignore or minimize the many other factors that affect behavior.

INFLUENCING LAWS AND POLICIES

When assessment shows that laws or policies are key factors influencing critical behaviors, practitioners and their community partners will need to plan and implement activities to influence those laws and policies. Practitioners used to working at the local level sometimes treat laws and policies as external or structural factors; they may even consider them beyond their control. And yet, these factors can sometimes be powerful motivators of behavior.

Laws and policies sometimes provide incentives for sustainable—or disincentives for unsustainable—behaviors. However, laws and policies sometimes motivate unsustainable practices, such as when legal title for a piece of land can be obtained automatically by cutting down primary forest and converting the land to pasture or crops.

Laws and policies related to resource access and tenure are especially likely to be key factors influencing behavior toward those resources. As mentioned in Box 6, the CAMPFIRE program in Zimbabwe has as its foundation a national policy change that granted the authority for some district-level governments to manage and receive benefits from the wildlife in their districts (Metcalf, 1994). Examples in which resource tenure laws or policies seem to motivate unsustainable practices were discussed in Chapter III. In Namibia, for example, wildlife law and policy until recently provided an incentive for individuals on communal lands to kill roan antelope for meat; and in Mali, the national forestry code may work to discourage tree planting by individual farmers.

It is important to remember that decisions, practices, and actions at all levels of political and economic organization—local, national, regional, and international—are important for sustainable natural resources management and conservation. Focusing only on local-level behaviors would leave out key stakeholders and actors, in particular key “institutional actors” (Murphree, 1994).

Robert Chambers (1992) believes that senior government officials who make decisions and formulate policy often lack recent direct knowledge of the people and situations that their decisions affect, and argues that their participation in rapid rural appraisal (RRA) or participatory rural appraisal (PRA) exercises would improve their decisions. “Information users should be information seekers.... RRA is best carried out by the people who will make use of the information ... scientists, administrators, program officers, policymakers should go to the field to see and learn for themselves,” write Freudenberger and Gueye (1990). Johansson and Hoben (1992) describe a case in which senior government officials in Tanzania were the team members in an RRA exercise, the goal of which was to give them better information for the formulation of land policy.

Paula Palmer, a participatory action research practitioner, pointed out that “to achieve sustainable livelihoods for the local population” requires work not only with them, but “at the level of national and international policy and trade. It is important for practitioners and local people participating in these forms of social analysis to keep in mind the influences that originate beyond the boundaries of the land area in question and to include them in the analysis. Otherwise the process may be based on a false assumption that local actors alone can bring about desired changes. Sometimes they can, but more often policy changes are also required.”

Working for legal and policy change requires political organization and action, such as grassroots organization, lobbying, and litigation. Of course, this is not easy, and sometimes not safe, in many countries today. Perhaps that is one reason some conservationists and communities have chosen not to try to influence the legal and policy factors that motivate natural resources management behaviors. It is also important to remember that working to maintain laws and policies that motivate sustainable behaviors is just as important as working to change those that motivate unsustainable behaviors.

RESOLVING DISPUTES

Conflicts about how natural resources should be used and conserved are inevitable for a number of reasons. There are usually many stakeholders with interests in the natural resources of any given place; stakeholders can range from the local to national and international levels; and they can differ widely in economic and political power and options. Even local communities are not homogeneous. Conflicts arise because of differences in the values and interests of diverse actors and stakeholders.

Because conflicts are inevitable, processes for dealing with them as constructively as possible are needed. Societies, both traditional and modern, have methods for managing conflicts, of course. But rapid social and environmental change has increasingly stressed those methods, leading to destructive responses to conflicts. In response to this trend, scholars and practitioners have given increased attention to understanding and constructively managing conflict, establishing a field called “dispute resolution”—or sometimes “alternative dispute resolution,” to distinguish it from more traditional and sometimes adversarial, destructive ways of resolving disputes.

The field of dispute resolution recognizes the inevitability of conflict, and some dispute-resolution practitioners view conflict as natural, necessary, and creative—as an opportunity rather than a problem. Some professionals in this field distinguish between a conflict and a dispute. “Conflict” is used by them to refer to a fundamental difference in values and interests among actors and stakeholders; “disputes” are episodes of disagreement and controversy that erupt repeatedly over specific issues from a base of conflict (Burgess and Burgess, 1994; Burton and Dukes, 1990). They emphasize that it is constructive conflict management or dispute resolution that they work toward, not necessarily the resolution of the underlying conflicts themselves.

To manage conflicts and resolve disputes, an understanding of the factors that cause them is required. Many of the methods and tools for assessment that we have already discussed provide information that can give an understanding of the roots of natural resources conflicts. For example, conflicts over who makes decisions about resource use can often occur, so some understanding of resource conflicts can be gained from information in level of decision matrices such as that shown in Figure 19. Matrices that focus specifically on actual or potential conflicts also can be developed. The conflict matrix shown in Figure 23 was produced by a group of men during a rapid rural assessment in Senegal (Freudenberger, 1994). According to Karen Freudenberger, “The matrix helped them to see the importance of problems between people starting gardens/orchards and goat owners. It was discovered that due to ... the conflicts that had arisen, goat owners (who were disproportionately women) had gotten rid of all of their animals.”

Figure 23. Matrix of Natural Resources Conflicts from Senegal

Figure 8: Conflict matrix

| <i>Disputants</i> <i>Natural Resources</i> | <i>Between villagers</i> | <i>With neighboring villages</i> | <i>With strangers</i> | <i>With the State</i> |
|---|--------------------------|----------------------------------|-----------------------|-----------------------|
| <i>Trees</i> | • 7 | — | ••• 6 | — |
| <i>Land</i> | • 7 | — | ••• 4 | — |
| <i>Grass/pasture</i> | ••• 6 | ••••• 8 | — | — |
| <i>Water</i> | — | — | — | — |
| <i>Animals</i> | •••••••••• 60 | •••••••••• 90 | •••••••••• 75 | — |

Source: Freudenberger, 1994, p. 49

Practitioners and communities not only need methods and tools for understanding the causes of natural resources conflicts; they also need guidance about what to do to manage such conflicts as constructively as possible. Dispute resolution involves many of the things we have already discussed, such as good communication, the involvement and participation of all stakeholders, and the importance of building trust and rapport among all stakeholders. The field of dispute resolution has developed its own special methods and tools, however, and some of these could be useful to people involved in conservation and natural resources management.

Some widely accepted basic principles of dispute resolution are set out in the book *Getting to Yes* by Fisher and Ury (1991):

- Separate the people from the problem. Negotiators should see themselves as attacking a common problem, not each other.
- Focus on interests, not positions. Positions are a rigid statement of what you want; interests are the underlying reasons for your positions. Focusing on interests may reveal the existence of mutual or complementary interests that will make agreement possible.
- Invent options for mutual gain. The authors call these options “win-win” solutions. To do this requires truly understanding the other party’s values and interests. It also requires real communication, which can only come from mutual respect and a sincere desire to solve the common problem.

- Insist that objective criteria be used to determine fair and equitable actions to be agreed upon. Enforcing vague requirements is impossible. Vagueness can also lead to cheating or the suspicion of cheating, which can ruin the agreement.
- Know the best alternative to a negotiated agreement. The reason to negotiate with someone is to produce better results than you could obtain without negotiating. If you have not thought about what results you could obtain without negotiating, you risk rejecting an agreement you would be better off agreeing to, or agreeing to something you would be better off rejecting.

There is a relatively rich literature reflecting the experience of a decade or more of efforts to apply basic principles of conflict management to environmental and natural resources disputes in developed countries (Bingham, 1986; Crowfoot and Wondolleck, 1990; Wondolleck, 1988). John Hough (1988) reviewed this literature and applied some of the key principles to conflicts between national parks and surrounding human communities in developing countries. He identified eight key obstacles to the effective management of park-people conflicts in developing countries:

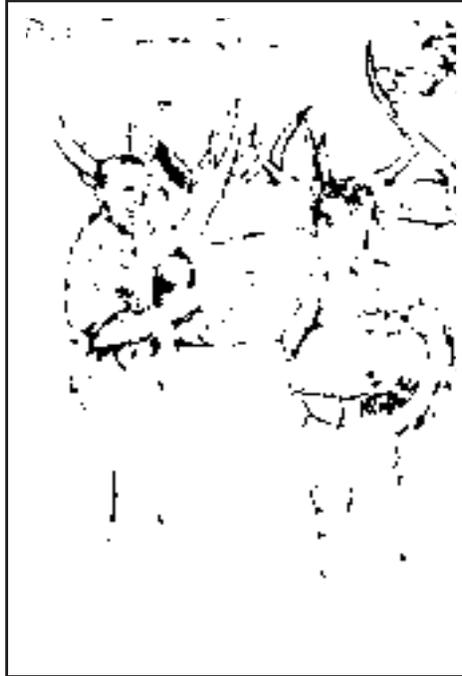
- the institutional environment of national parks
- lack of trust between park authorities and local people
- poor communication

- the large number of stakeholders involved
- large power differences between park authorities and local people
- the risk and uncertainty of entering into a dispute resolution process
- the problem of enforcing agreements
- lack of clarity about best alternatives to a negotiated solution among all stakeholder groups

Natural resource managers in developing regions, including Africa, are showing increasing interest in adapting and using dispute resolution methods from developed regions (Pendzich, 1993). The International Institute for Environment and Development (IIED) in London, for example, is working to adapt PRA techniques to environmental conflict situations, according to Charles Lane of IIED.

One potential weakness of the basic dispute resolution principles described above, including those adapted for natural resources disputes, is that they have been developed in a modern, Western cultural context. Different cultures view conflict in different ways and have their own disputing styles and indigenous methods for managing conflict. In many cultures conflicts may not be openly discussed, for example. There is a substantial body of literature on how cross-cultural issues influence conflict management, especially how they influence international negotiations (Bendahmane and McDonald, 1984; Fisher, 1980). Adapting the lessons from this literature to conservation and natural resources management conflicts would be very useful.

VII. Evaluating and Improving the Process of Understanding and Influencing Behavior



BACKGROUND

Evaluation can be defined as gathering information to determine the effectiveness of activities, projects, and programs for the purpose of making decisions about them. Such decisions can be about how to modify an activity to make it more effective; whether to continue to support it with inputs of money, staff time, and other resources; or whether to use it as a model for other programs. The root word of “evaluate” is “value.” In evaluating a program we try to answer the question: How valuable is (or was) it for solving the problems it is (or was) designed to solve?

Evaluation involves assessing effectiveness. One good definition is that of Passineau (1975): “Evaluation is a process of collecting, weighing, and using information which is pertinent

to making decisions about the merit of a program.” Another is that of Steelquist (1993): “Program evaluation is really just a matter of envisioning program outcomes, designing ways to reach those outcomes, and finding out if those outcomes have been achieved.”

On one hand, evaluation seems simple and familiar: you have goals and objectives, and you check to see how you are doing after some period of time. On the other hand, evaluation sometimes seems esoteric, like something only outside experts do. But if evaluation is demystified it is easy to see that it should be an integral part of any activity, project, or program.

This chapter briefly summarizes some of the voluminous literature on evaluation, especially that most relevant to understanding and influencing environmental behaviors.

USING EVALUATION THROUGHOUT THE PROCESS

There is a logical link between evaluation and all other stages of the process of understanding and influencing behaviors in conservation—the assessment, planning, and implementation stages (see Fig. 4). This logical link exists because evaluation tries to answer the question: Did this activity, project, or program do what we thought it would do and wanted it to do? Evaluation is an integral part of the whole process (Jacobson, 1991; Rugh, 1992). “Ideally, evaluation should be conducted from beginning to end, providing feedback on all stages of the development, implementation, and outcome of a program” (Jacobson, 1991).

Robert Steelquist, in “Evaluation—Right from the Start,” argues that you can only answer the question: Did this work? if you have clear goals and objectives before beginning an activity, project, or program (Steelquist, 1993). If you don’t have clear objectives at the beginning of a program, evaluation is like trying to decide who is the best shot after the fact, when the marksmen hadn’t agreed on which target they were shooting at. One may say *she* was best because she hit the bullseye of a target, but the other may say *he* was better because he was aiming at a tree much farther away than the target, and hit it! Susan Jacobson (1991) writes that “... without stated objectives, it usually is difficult to determine whether the program is successful, how it may be improved, or to justify its accomplishments to administrators or funding agencies.”

The need for clear objectives right from the start seems to be the message coming from the best work on the evaluation of activities designed to influence conservation and natural resources management behavior (Pomerantz and Blanchard, 1992; Dietz and Nagagata, 1995; Jacobson, 1991; Rugh, 1992; Steelquist, 1993).

As discussed at the beginning of Chapter 2, we found that, unfortunately, conservation projects frequently jumped straight into implementation without much assessment or planning. Because of this, their goals are often broad and vague, making evaluation difficult, if not impossible. It is therefore perhaps not surprising that when project activities do not seem to be having the desired effect, project staff have to go back to earlier stages of the process—to assessment and planning—and start over more deliberately.

One important purpose for evaluating is to improve implementation (see Fig. 4). This kind of evaluation collects information about what is happening at the lower levels of the means-ends hierarchy. Are inputs of resources generating the kinds of activities expected and needed? Are those activities involving the actors needed to influence the key factors that motivate critical behaviors, as planned? If not, re-evaluation of the adequacy of the stages that led to implementation—assessment and planning—may be needed. In this way, evaluation is an iterative activity; information about how things are working is used to steer and guide the implementation stage of the process. It is useful for adaptive management of activities, projects, and programs. This is sometimes called *formative evaluation*: “evaluation that helps you understand your program while it is under way” (Steelquist, 1993).

Another important reason for evaluating is to find out if the ultimate goals and objectives of the activity were realized—to evaluate outcomes or impacts of the process (see Fig. 4). Impact evaluation requires information about what is happening at the upper levels of the means-ends hierarchy. Did changes in the key factors that influence behaviors lead to more sustainable behaviors? Did maintaining or changing behaviors have the predicted and desired effect on social and environmental conditions, moving them in the direction of

sustainability? This is sometimes called *summative evaluation*: “evaluation that helps you understand the program after it has taken place” (Steelquist, 1993). This kind of evaluation is useful for deciding whether an activity would make an appropriate model for replication by others, and for making decisions about whether to continue supporting the activity.

Evaluation makes use of some combination of the methods and tools reviewed in Chapter IV. Feuerstein (1986) and Rugh (1992) provide excellent, user-friendly discussions of methods and tools for evaluation. Creative use of a variety of methods is needed to overcome the limitations of any single technique. Evaluation exercises often suffer from people telling evaluators what they think the evaluators want to hear rather than what is actually true. Research methods that rely on direct behavioral observation or other alternatives to direct questioning may be needed for effective evaluation.

The hypothetical example from Madagascar (Box 1) showed that interventions can have unexpected and undesirable effects. That is especially true if activities have been designed on the basis of assumptions about behavioral motivations and not based on adequate assessment and research. Periodic evaluation is needed to correct the course of programs experiencing such unwanted effects—to provide the “self-correcting processes” needed to ensure that programs are effective (Jacobson, 1991). Unexpected effects are not always bad, however; interventions may inadvertently do exactly the right thing. In such cases evaluation can detect those unanticipated successes, encourage practitioners to learn lessons from them, and reinforce successful activities.

The time lag between activities designed to influence natural resource management behaviors and actual behavioral changes can be long.

According to Fred Weber (1992), “the time lapse between USAID inputs/outputs and people-level impacts is often in the neighborhood of 5-15 years. Monitoring progress, therefore, requires a series of intermediate indicators.” It is nearly impossible at the start of a project to predict how long it will take to change behavior. Evaluation techniques should take into account the very gradual behavioral changes that are harbingers of more significant or widespread changes. Even if only a few individuals adopt a new environmentally sound practice during the project, such small changes should count as a measure of success (Wood and Wood, 1990).

The Marine Bird Conservation Project in Quebec incorporated an evaluation dimension that provides an excellent demonstration of the effectiveness of a behavior-centered approach. Kathleen Blanchard carried out a follow-up survey in 1988, six years after her initial survey of heads-of-households in 1981-82. The 1988 survey showed several “significant changes in local knowledge of wildlife law, attitudes toward hunting and regulations, and level of harvest of birds and eggs” (Blanchard and Monroe, 1990). Although it is only an indirect measure of behavior, the mean response to the question: What percent of families in your village harvest seabirds and eggs? dropped significantly from about 76 percent in 1981 to 48 percent in 1988.

Evaluation has also demonstrated the effectiveness of the approach taken by the Golden Lion Tamarin Project in Brazil. The results of a follow-up survey in 1986 were compared with the results of the initial survey in 1984; the comparison “indicated significant changes in knowledge and attitudes of local Brazilian adults and students. Since no other activities or media events occurred in the area ... these changes can be attributed to two years of this project’s activities” (Dietz and Nagagata, 1995).

EVALUATION AND PARTICIPATION

The need for all stakeholders to participate in the process of understanding and influencing conservation and natural resources management behaviors was discussed earlier. Because evaluation is an integral and essential part of this process, it is clear that participation in evaluation, or participatory evaluation, is needed. According to Feuerstein (1986), “Some traditional evaluation approaches have tried to make the people suit or ‘fit’ the evaluation methods. The newer approaches aim to make the methods suit the people and their situation. The approaches and technology are tailored to suit the real contexts of development programmes, and the abilities and technical levels of the participants. The collective name for such approaches and methods is participatory evaluation.”

Ford, Razakamanarina, and Randrianarisoa (1994) describe new uses for participatory rural appraisal (PRA) methods in participatory evaluation. They point out that “... in spite of dramatic growth in people-based planning, there has been little formal or systematic application of participatory tools for monitoring and evaluation.” They describe innovative uses of some standard methods and tools used in the assessment stage—such as maps, calendars, and matrices—to gather information for evaluation. Information gathered in an initial PRA exercise can be saved in a village log book; then, if the same methods are used again at a later time, the new information can be compared with the baseline, trends detected, and community action plans modified.

Norman Uphoff (1992) argues that monitoring and evaluation exercises are most useful when they use a participatory process. He writes, “As

much as possible, joint monitoring and evaluation activities carried out with the involvement of both intended beneficiaries and project personnel, rather than by either group alone, are desirable.” Uphoff cites examples from both Tanzania and Thailand where government officials and villagers alike changed their behavior once participation in monitoring and evaluation exercises made them aware of village conditions.

Feuerstein (1986) suggests that “one of the reasons why it is difficult to show success or failure is that success or failure can mean different things to different people.” She gives an example of a project that built brick outhouses with locking doors in a rural village. Because even the houses in the village had no locks, outhouses came to be used for storing valuables like bicycles and tools—and were judged a great success by the villagers! They contributed little to village sanitation, the goal of the project, however, because they weren’t used as outhouses. Similar examples of divergent views of success could undoubtedly be found in conservation and natural resources management projects.

Whether the activity, project, or program had clearly defined objectives or not, outsiders can still look at it using their own criteria of value and judge its effectiveness from that point of view. They can come in after the fact, and using their evaluative lens, judge whether it had a certain valued outcome or not. But without some criteria or standards by which to judge effectiveness, whether built into the program from the start or imposed retrospectively, evaluation is impossible.

EVALUATION AND HYPOTHESIS - TESTING

Although the concept of sustainability has been around for some time, in many cases no one knows yet how it actually can be achieved. Our practical understanding of how to implement conservation is still growing, and in most cases a great deal of experimentation and hypothesis testing is needed to develop sustainable communities and societies.

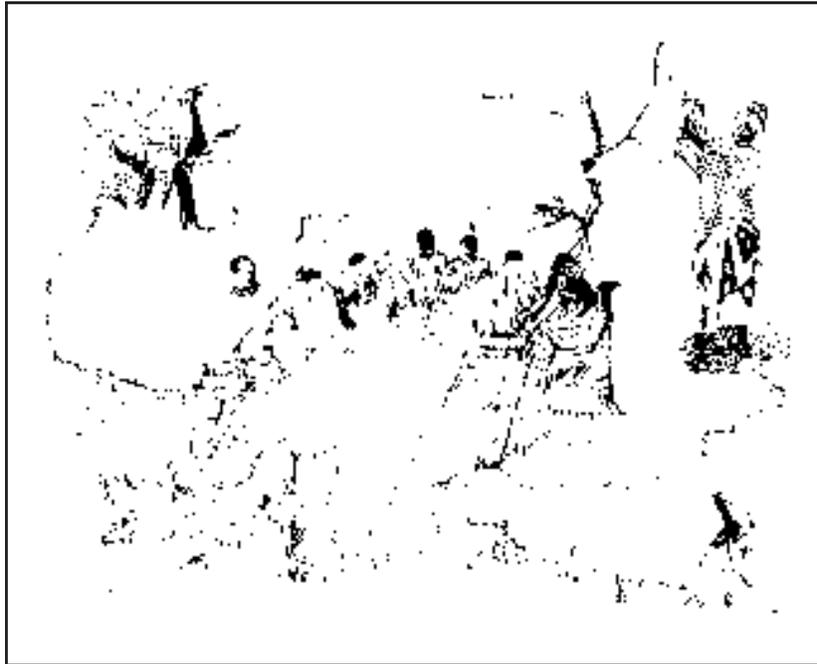
Some people now talk about hypothesis testing in conservation and natural resources management projects. The USAID/Madagascar SAVEM Project does so, for example, as does the Biodiversity Conservation Network described in Box 16. The idea behind hypothesis testing in conservation is to gather information about what works while implementing activities.

Hypothesis testing in conservation and natural resources management is an excellent idea. It may, however, be difficult to test hypotheses and at the same time make use of formative evaluation to improve the implementation process. Evaluating the implementation stage of

the process is useful for adaptive management—for modifying the intervention before its completion, if need be. But adaptive management is not really compatible with hypothesis testing. Hypotheses have to be falsifiable to be testable. If an intervention seems not to be working, and the goal is to test a hypothesis about what works, practitioners need to be willing to let it fail; otherwise they fail to carry out an experiment that tests the hypothesis.

The complexity of the situations in which natural resources management takes place leads to another difficulty for hypothesis testing. Bergdall (1993) points out that several factors may be causal and that “it is difficult to conclude ... that any one of them was the key determining factor over the others. Proof of a simple cause-and-effect relationship could not be found in the monitoring exercise. A review of the evidence does suggest that the planning seminars and subsequent follow-up work in Managhat and Endabeg [Tanzanian villages] played an important catalytic role in enabling the process of self-reliant development to occur.” The distinction between a catalyst and a cause may be useful, if evaluation methods can demonstrate such a catalytic role.

VIII. Conclusion



The analytical journey reflected in this report brought us face to face with many of the challenges of sustaining the natural resources base while meeting people's needs and aspirations in Africa.

We came to see that people interact with their environment through their behavior—their decisions, practices, and actions. The behavior of individuals and groups forms the interface between ecological systems and human social systems; behaviors, therefore, provide a “window” into those systems. We realized that promoting sustainable natural resources management requires efforts to maintain some behaviors and change others.

We learned that each community and culture makes decisions about how to use the natural resources in its environment in the context of its own array of values. Successful conservation and sustainable natural resources management requires integrating the values and inter-

ests of a range of stakeholders and actors from all levels (local, national, and international), and that integration requires the active participation of stakeholders from all levels.

In our field work we learned that although the pivotal role of social factors in conservation and sustainable natural resources management is increasingly recognized, many conservation and natural resources management practitioners still lack practical ways of understanding and influencing environmentally relevant behaviors. A conceptual framework for setting goals and objectives, designing and implementing activities, and evaluating the effectiveness of those activities—a *process* for understanding and influencing behaviors—was one clear need. Another need was for methods and tools for gathering the social information required to apply such a process effectively. We found, for example, that although some conservation practitioners were already using various methods and tools of social research, such as surveys

and community meetings, many were not aware of the wide range of methods they could be using, especially participatory methods. Neither a process nor information-gathering methods alone are sufficient; both are needed.

In our field work we found that the first stage of the process of understanding and influencing behavior, which we call assessment, is often neglected. We found, for example, that activities designed to influence conservation and natural resources management behaviors are often based on untested, and sometimes mistaken, assumptions made by their planners and implementers. Assumptions about what motivates behaviors, or whether those behaviors are sustainable, are not often checked through social assessment, especially of a kind that involves real participation in the process by the actors themselves. Therefore, to meet a critical need, we focused our attention on the assessment stage of the process.

An understanding of the context and motivations of behaviors provided by assessment and research can be used to design and implement activities aimed at influencing those behaviors. Depending on which factors are key determinants of critical behaviors, different kinds of activities are needed. A number of general types of activities, each of which is most appropriate for influencing one or several of the factors that motivate behavior, are discussed in the report:

- influencing knowledge, values, and social norms: education, communication, and social marketing approaches
- influencing sociocultural factors: education, communication, and social marketing approaches
- influencing options and skills: extension, training, and technical assistance

- influencing economic factors: enterprise development, markets, and incentives and disincentives
- influencing laws and policies: legislation and policy reform

We learned also about the importance of dispute resolution: when stakeholders differ widely in their values, interests, and views about what should be done, resolving disputes may be the most appropriate and feasible thing to do, at least as a first step.

There is a logical link between evaluation and each of the other stages of the process of understanding and influencing behaviors in conservation and natural resources management—the assessment, planning, and implementation stages. Integrating evaluation into the entire process of understanding and influencing behaviors is important.

Some scholars and practitioners express the view that only trained social scientists can, or should, do the social assessment needed to plan, implement, and evaluate conservation activities. However, many practitioners and communities lack the resources to hire trained social scientists to provide all, or even some, of the social information they need. We believe that conservation practitioners and natural resources managers can benefit from learning the process, and some basic methods and tools, of social assessment.

We hope that this report will stimulate discussion and provoke thought among the designers, implementers, and managers of conservation and natural resources management activities. We view the report not as the final word on this complex subject, but only another step in an ongoing analytical safari. As more practitioners become familiar with and use the kinds of processes and methods described here,

refining and adapting them to their own unique situations, many lessons will be learned.

We hope that this report contributes to that process and that the findings and conclusions reflected in the report will be useful to practitioners seeking to understand what motivates the decisions, actions, and practices that affect the

environment, and will thereby enable them to identify appropriate activities for influencing those behaviors in order to promote sustainable natural resources management and conservation. Ultimately we hope that this process enables practitioners and communities to maintain and improve both the quality of their lives and the health of their environment.

Recommended Reading

The references listed below in association with specific chapters and topics within chapters are especially useful and rich sources of ideas and information, and were relied upon extensively in preparing this report. Addresses of organizations from which the publications recommended below can be obtained are given below unless they are published in a journal or by a major publisher.

Chapter I

Participation:

IIED. 1994. *Whose Eden? An Overview of Community Approaches to Wildlife Management*. International Institute for Environment and Development (IIED), 3 Endsleigh Street, London WC1 HODD, United Kingdom.

Values:

Fox, Warwick. 1990. *Toward a Transpersonal Ecology: Developing New Foundations for Environmentalism*. Boston & London: Shambala.

IUCN. 1991. *Caring for the Earth: A Strategy for Sustainable Living*. Published in partnership by IUCN-The World Conservation Union, UNEP-United Nations Environment Programme, and WWF-World Wide Fund for Nature. Gland, Switzerland: IUCN.

McNeely, Jeffrey A., Kenton R. Miller, Walter V. Reid, Russell A. Mittermeier, and Timothy B. Werner. 1990. *Conserving the World's Biological Diversity*. Gland, Switzerland: IUCN (World Conservation Union/International Union for the Conservation of Nature and Natural Resources); Washington, D.C.: World Resources Institute, Conservation International, World Wildlife Fund-US, and The World Bank.

Miller, Sandra E., Craig W. Shinn, and William R. Bentley. 1994. *Rural Resource Management: Problem Solving for the Long Term*. Ames, Iowa: Iowa State University Press.

Chapter II

Models:

Bennett, Claude. 1976. "Analyzing Impacts of Extension Programs," Agricultural Cooperative Extension, Report 511. USDA Cooperative Extension Service, CSREES, AgBox 2202, Washington, DC 20250-2202 USA.

Jacobson, Susan K. 1991. "Evaluation Model for Developing, Implementing, and Assessing Conservation Education Programs: Examples from Belize and Costa Rica." *Environmental Management* 15(2): 143-150.

Pomerantz, Gerri A., and Kathleen A. Blanchard. 1992. "Successful Communication and Education Strategies for Wildlife Conservation." *Transactions of the 57th North American Wildlife & Natural Resources Conference*. pp. 156-163.

Steelquist, Robert. 1993. "Evaluation-Right from the Start: A Workbook on Environmental Education Program Design and Evaluation." Unpublished workbook developed for the U.S. Fish and Wildlife Service, National Education Training Center, 4040 N. Fairfax Dr., Rm 304, Arlington, VA 22203 USA.

Chapter III

Critical Behaviors:

Graeff, Judith, John P. Elder, and Elizabeth Mills Booth. 1993. *Communication for Health and Behavior Change: A Developing Country Perspective*. San Francisco: Jossey-Bass.

Benefits and Barriers:

Archie, Michele, Lori Mann, and William Smith. 1993. *Partners In Action: Environmental Social Marketing and Environmental Education*. Academy for Educational Development 1255 23rd Street, N.W., Washington, DC 22037 USA.

Middlestadt, Susan E., William A. Smith, and Richard Bossi. 1993. "Human Behavior and Biodiversity: An Approach to Program Management," Unpublished report prepared for the Biodiversity Support Program by the Academy for Educational Development, 1255 23rd Street, N.W., Washington, DC 22037 USA.

Chapter IV

Freudenberger, Karen Schoonmaker. 1994. *Tree and Land Tenure: Rapid Appraisal Tools*. Community Forestry Field Manual 4. Rome: Forestry Department, Food and Agriculture Organization of the United Nations (FAO), Viale delle Terme di Caracalla, 00100 Rome, Italy.

Freudenberger, Mark, and Karen Schoonmaker Freudenberger. 1993. *Fields, Fallow, and Flexibility in Ndam Mor Fadamba, Senegal*. International Institute for Environment and Development (IIED), 3 Endsleigh Street, London WC1 HODD, United Kingdom.

Freudenberger, Karen Schoonmaker, and Bara Gueye. 1990. *RRA Notes to Accompany Introductory Training Module*. Unpublished, available in English from the authors and in French from IIED, London (see previous listing).

National Environment Secretariat (Government of Kenya), Egerton University, Clark University, and the Center for International Development and Environment of the World Resources Institute. 1990. *Participatory Rural Appraisal Handbook: Conducting PRAs In Kenya*. World Resources Institute, 1709 New York Ave., N.W., Washington, DC 20006 USA.

Thomas-Slayter, Barbara, Andrea Lee Esser, and M. Dale Shields. 1993. *Tools of Gender Analysis: A Guide to Field Methods for Bringing Gender into Sustainable Resource Management*. International Development Program, Clark University, Worster, MA 01610-1477 USA.

Chapter V

Cousins, Tessa, Pintile Davids, and Barbara Wyckoff-Baird. 1994. "Participatory Rural Appraisal for Planning in Natural Resources Management: Workshop Report," from a workshop held April 20-28, 1994, by the Living in a Finite Environment (LIFE) Programme in Namibia.

Freudenberger, 1994, op. cit., see above.

Graeff, Elder, and Booth, 1993, op. cit., see above.

Chapter VI

Education, Communication, and Social Marketing:

Archie, Mann, and Smith, 1993, op. cit., see above.

Hungerford, Harold R. and Trudi L. Volk. 1990. "Changing Learner Behavior Through Environmental Education." *Journal of Environmental Education* 21(3): 8-21.

Jacobson, 1995, op. cit., see above.

Pomerantz and Blanchard, 1992, op. cit., see above.

Economics:

Brown, Michael and Barbara Wyckoff-Baird. 1992. *Designing Integrated Conservation and Development Projects*. Washington, D.C.: Biodiversity Support Program.

IIED, 1994, op. cit., see above.

Dispute Resolution:

Fisher, Roger and William Ury. 1991. *Getting to Yes, Negotiating Agreement Without Giving In*. New York: Penguin Books.

Freudenberger, 1994, op. cit., see above.

Hough, John L. 1988. "Obstacles to Effective Management of Conflicts between National Parks and Surrounding Human Communities in Developing Countries." *Environmental Conservation* 15(2): 129-136.

Chapter VII

Integrating Evaluation Throughout the Process:

Bennett, 1976, op. cit., see above.

Jacobson, 1991, op. cit., see above.

Steelquist, 1993, op. cit., see above.

Evaluation and Participation:

Feuerstein, Marie-Thérèse. 1986. *Partners in Evaluation: Evaluating Development and Community Programmes With Participants*. London: MacMillan.

Rugh, Jim. 1992. *Self-Evaluation: Ideas for Participatory Evaluation of Rural Community Development Projects*. World Neighbors, 4127 NW 122 Street, Oklahoma City, OK 73120-8869 USA.

References

Academy for Educational Development. 1994. "Environmental Education and Communication (GreenCOM) Project." Project booklet. Washington, D.C.: Academy for Educational Development.

Ady, Janet C. 1994. "Teach About Geese." In *Environmental Problem Solving: Theory, Practice and Possibilities in Environmental Education*, Bardwell, Lisa V., Martha C. Monroe, and Margaret T. Tudor, eds. 1994. Troy, Ohio: North American Association for Environmental Education (NAAEE). pp. 123-124.

African Wildlife Foundation. 1993. "Knowledge, Attitudes, and Practices Survey." Unpublished survey.

Archie, Michele, Lori Mann, and William Smith. 1993. *Partners In Action: Environmental Social Marketing and Environmental Education*. Washington, D.C.: Academy for Educational Development.

Bardwell, Lisa V., Martha C. Monroe, and Margaret T. Tudor, eds. 1994. *Environmental Problem Solving: Theory, Practice and Possibilities in Environmental Education*. Troy, Ohio: North American Association for Environmental Education (NAAEE).

Bendahmane, Diane B., and John W. McDonald, Jr. 1984. *International Negotiation: Art and Science*. Washington, D.C.: Foreign Service Institute, U.S. Department of State.

Bennett, Claude. 1976. "Analyzing Impacts of Extension Programs," Agricultural Cooperative Extension, Report 511. Washington, D.C.: USDA Cooperative Extension Service.

Bennett, Claude, and Kay Rockwell. 1995. "Targeting Outcomes of Programs (TOP): An Integrated Approach to Planning and Evaluation." Unpublished draft manuscript.

Bergdall, Terry D. 1993. *Methods for Active Participation: Experiences in Rural Development from East and Central Africa*. Nairobi: Oxford University Press.

Bingham, Gail. 1986. *Resolving Environmental Disputes: A Decade of Experience*. Washington, D.C.: The Conservation Foundation.

Biodiversity Support Program. 1994a. *Biodiversity Conservation Network: Evaluating an Enterprise-Oriented Approach to Community-Based Conservation in the Asia/Pacific Region, Annual Report: January 1 - December 31, 1994*. Washington, D.C.: Biodiversity Support Program.

———. 1994b. "Summaries of USAID Projects in Africa with Environmental Education and Communication Components." Unpublished report. Washington, D.C.: Biodiversity Support Program.

———. 1993. *African Biodiversity: Foundation for the Future, A Framework for Integrating Biodiversity Conservation and Sustainable Development*. Washington, D.C.: Biodiversity Support Program.

Blanchard, Kathleen. 1987. "Strategies for the Conservation of Seabirds on Quebec's North Shore and Geese on Alaska's Yukon-Kuskokwim Delta: A Comparison." *Transactions of the 52nd North American Wildlife & Natural Resources Conference*. pp. 399-407.

Blanchard, Kathleen A., and Martha C. Monroe. 1990. "Culture and Conservation: Strategies for Reversing Population Declines in Seabirds." *Endangered Species UPDATE 7* (3&4): 1-5.

Brown, Michael, and Barbara Wyckoff-Baird. 1992. *Designing Integrated Conservation and Development Projects*. Washington, D.C.: Biodiversity Support Program.

Burgess, Guy, and Heidi Burgess. 1994. "Environmental Mediation: Beyond the Limits; Applying Dispute Resolution Principles to Intractable Environmental Conflicts." Working Paper 94-50, Conflict Resolution Consortium, University of Colorado, Boulder, Colo.

Burton, John, and Frank Dukes, eds. 1990. *Conflict: Readings in Management and Resolution*. New York: St. Martin's Press.

Byers, Bruce A. 1988. "Facts Change Opinions." *Bulletin of the Atomic Scientists* 44 (Nov. 1988): 46.

Caduto, Michael J. 1985. *A Guide on Environmental Values Education*. UNESCO-UNEP International Environmental Education Programme, Environmental Education Series 13. Paris, France: UNESCO.

Carovano, Kathryn, and Susan E. Middlestadt. 1993. "Understanding Women's Prevention Behavior." In *A World Against AIDS: Communication for Behavior Change*, Smith, William A., Michael J. Helquist, Ann B. Jimerson, Kathryn Carovano, and Susan E. Middlestadt, eds. 1993. Washington, D.C.: Academy for Educational Development. pp. 107-127.

Chambers, Robert. 1992. "Participatory Rural Appraisals; Past, Present and Future." *Forests, Trees and People Newsletter* 15/16 (Feb. 1992): 4-9.

Cousins, Tessa, Pintile Davids, and Barbara Wyckoff-Baird. 1994. "Participatory Rural Appraisal for Planning in Natural Resources Management: Workshop Report," from a workshop held April 20-28, 1994, by the Living in a Finite Environment (LIFE) Programme in Namibia.

Crowfoot, James E., and Julia M. Wondolleck. 1990. *Environmental Disputes: Community Involvement in Conflict Resolution*. Covelo, Calif.: Island Press.

Dagamaissa, Abdoulaye. 1990. "Foresters' Perceptions of Village Forestry in Mali." Unpublished M.S. Thesis, University of Idaho.

Davis, Shelton H., ed. 1993a. *Indigenous Views of Land and the Environment*, World Bank Discussion Papers, No. 188. Washington, D.C.: The World Bank.

Davis, Shelton H. 1993b. "Hard Choices: Indigenous Economic Development and Intellectual Property Rights." *Akwe:kon Journal*, Winter 1993: 19-25.

Davis, Shelton, and Katrinka Ebbe. 1994. "Traditional Knowledge and Sustainable Development." Proceedings from a conference sponsored by the World Bank Environment Department and the Bankwide Task Force on the 1993 U.N. International Year of the World's Indigenous People.

De Young, Raymond. 1993. "Changing Behavior and Making It Stick: The Conceptualization and Management of Conservation Behavior." *Environment and Behavior* 25: 485-505.

Dietz, Lou Ann, and Elizabeth Y. Nagagata. 1995. "Golden Lion Tamarin Conservation Program: A Community Education Effort for Forest Conservation in Rio de Janeiro State, Brazil." In *Conserving Wildlife: International Education/Communication Approaches*, Jacobson, Susan K., ed. 1995. New York: Columbia University Press. pp. 95-124.

Dorm-Adzobu, Clement. 1991. *Religious Beliefs and Environmental Protection: The Malshegu Sacred Grove in Northern Ghana*. The Center for International Development and Environment, ed. Washington, D.C.: World Resources Institute.

Dwyer, William O., Frank C. Leeming, Melissa K. Cobern, Bryan E. Porter, and John M. Jackson. 1993. "Critical Review of Behavioral Interventions to Preserve the Environment: Research Since 1980." *Environment and Behavior* 25(3): 275-321.

Fals-Borda, Orlando, and Muhammad Anisur Rahman. 1991. *Action and Knowledge: Breaking the Monopoly with Participatory Action-Research*. New York: The Apex Press.

Ferraro, Paul J., and Randall A. Kramer. 1995. "A Framework for Affecting Household Behavior to Promote Biodiversity Conservation." Report prepared for the USAID Africa Bureau by the Environmental and Natural Resources Policy and Training (EPAT) Project, Winrock International Environmental Alliance, Arlington, Va., USA.

Feuerstein, Marie-Thérèse. 1986. *Partners in Evaluation: Evaluating Development and Community Programmes With Participants*. London: MacMillan.

Finsterbusch, K., J. Ingersoll, and L.G. Llewellyn, eds. 1990. *Methods for Social Analysis in Developing Countries*. Boulder, Colo.: Westview Press.

Fishbein, Martin, and Susan E. Middlestadt. 1989. "Using the Theory of Reasoned Action as a Framework for Understanding and Changing AIDS Related Behaviors." In *Primary Prevention of AIDS: Psychological Approaches*, Mays, V. M., G.W. Albee, and S. F. Schneider, eds. 1989. Newbury Park, Calif.: Sage. pp. 93-110.

———. 1987. “Using the Theory of Reasoned Action to Develop Educational Interventions: Applications to Illicit Drug Use.” *Health Education Research* 2: 361-371.

Fishbein, Martin, Susan E. Middlestadt, and P. J. Hitchcock. 1991. “Using Information to Change STD Related Behaviors: An Analysis Based on the Theory of Reasoned Action.” In *Research Issues in Human Behavior and Sexually Transmitted Diseases in the AIDS Era*, Wasserheit, J., S. Aral, and K. Holmes, eds. 1991. Washington, D.C.: American Society for Microbiology.

Fisher, Glen. 1980. *International Negotiation: A Cross-Cultural Perspective*. Yarmouth, Maine: Intercultural Press.

Fisher, Roger and William L. Ury. 1991. *Getting to Yes: Negotiating Agreement Without Giving In*. New York: Penguin Books.

Force, Jo Ellen, Prosper K. Sawadogo, and Abdoulaye Dagamaissa. No date. “The GRAAP Technique: One Way to Involve Villagers in Forestry.” Unpublished manuscript. College of Forestry, Wildlife and Range Sciences, U. of Idaho, Moscow, Idaho, USA.

Ford, Richard, Ndranto Razakamanarina, and Christiane Randrianarisoa. 1994. “PRA for Monitoring and Evaluation: A Village Log Book from Ambodirafia, Madagascar.” Worcester, Mass.: Program for International Development, Clark University.

Fox, Warwick. 1990. *Toward a Transpersonal Ecology: Developing New Foundations for Environmentalism*. Boston and London: Shambala.

Freudenberg, W. R. 1986. “Social Impact Assessment.” *Annual Review of Sociology* 12: 451-478.

Freudenberger, Karen Schoonmaker. 1994. *Tree and Land Tenure: Rapid Appraisal Tools. Community Forestry Field Manual 4*. Rome: Food and Agriculture Organization of the United Nations, Forests, Trees and People Programme.

Freudenberger, Mark, and Karen Schoonmaker Freudenberg. 1993. *Fields, Fallow, and Flexibility in Ndam Mor Fadamba, Senegal*. London: International Institute for Environment and Development.

Freudenberger, Karen Schoonmaker, and Bara Gueye. 1990. *RRA Notes to Accompany Introductory Training Module*. Unpublished manuscript.

Geisler, Charles C. 1993. “Adapting Social Impact Assessment to Protected Area Development.” In *The Social Challenge of Biodiversity Conservation*. Global Environment Facility Working Paper Number 1. Davis, Shelton H. ed. 1993. Washington, D.C.: The World Bank. pp. 25-33.

GRAAP (Groupe de Recherche et d’Appui pour l’Autopromotion Paysanne). 1988. *Pour une Pédagogie de l’Autopromotion*. Bobo-Dioulasso, Burkina Faso: Imprimerie de la Savane.

Graeff, Judith, John P. Elder, and Elizabeth Mills Booth. 1993. *Communication for Health and Behavior Change: A Developing Country Perspective*. San Francisco: Jossey-Bass.

Grimm, Curt, and Bruce A. Byers. 1994. "NGOs and the Integration of Conservation and Development in Madagascar: An Assessment for the USAID SAVEM Project." *Development Anthropology Network: Bulletin of the Institute for Development Anthropology* 12: 30-38.

Harrison, Paul. 1993. *The Third Revolution: Population, Environment, and a Sustainable World*. New York: Viking Penguin.

Heinen, Joel T. 1993. "Park-People Relations in Kosi Tappu Wildlife Reserve, Nepal: A Socio-economic Analysis." *Environmental Conservation* 20 (1): 25-34.

Hough, John. 1991. "Social Impact Assessment: Its Role in Protected Area Planning and Management." In *Resident Peoples and National Parks: Social Dilemmas and Strategies in International Conservation*, West, Patrick C., and Steven R. Brechin, eds. 1991. Tucson: University of Arizona Press. pp. 274-283.

———. 1988. "Obstacles to Effective Management of Conflicts between National Parks and Surrounding Human Communities in Developing Countries." *Environmental Conservation* 15 (2): 129-136.

Hungerford, Harold R., and Trudi L. Volk. 1990. "Changing Learner Behavior Through Environmental Education." *Journal of Environmental Education* 21(3): 8-21.

IIED. 1994. *Whose Eden? An Overview of Community Approaches to Wildlife Management*. London: International Institute for Environment and Development.

Interorganizational Committee. 1994. "Guidelines and Principles for Social Impact Assessment." NOAA Technical Memorandum NMFS-F/SPO-16, May 1994. Washington, D.C.: U.S. Department of Commerce.

IUCN. 1991. *Caring for the Earth: A Strategy for Sustainable Living*. Published in partnership by IUCN-The World Conservation Union, UNEP-United Nations Environment Programme, and WWF-World Wide Fund for Nature. Gland, Switzerland: IUCN.

———. 1980. *World Conservation Strategy: Living Resource Conservation for Sustainable Development*. IUCN (World Conservation Union/International Union for the Conservation of Nature and Natural Resources), UNEP, and World Wildlife Fund. Gland, Switzerland: IUCN.

Jacobson, Susan K., ed. 1995. *Conserving Wildlife: International Education and Communication Approaches*. New York: Columbia University Press.

———. 1991. "Evaluation Model for Developing, Implementing, and Assessing Conservation Education Programs: Examples from Belize and Costa Rica." *Environmental Management* 15(2): 143-150.

Johansson, Lars, and Allan Hoben. 1992. "RRA's for Land Policy Formulation in Tanzania." *Forests, Trees and People Newsletter* 15/16 (Feb. 1992): 26-31.

Katalihwa, M. 1993. "A Preliminary Assessment of Attitudes and Values Pertaining to Conservation among the Human Communities around Mkomazi Game Reserve, Tanzania." Unpublished project proposal.

Kerr, John, and N. K. Sanghi. 1992. "Indigenous Soil and Water Conservation in India's Semi-Arid Tropics." IIED Gatekeeper Series No. 34. London: International Institute for Environment and Development.

Kotler, P., and E. L. Roberto. 1989. *Social Marketing: Strategies for Changing Public Behavior*. New York: The Free Press.

Leader-Williams, N., and E. J. Milner-Gulland. 1993. "Policies for the Enforcement of Wildlife Laws: The Balance between Detection and Penalties in Luangwa Valley, Zambia." *Conservation Biology* 7: 611-617.

Mace, Ruth. 1993. "Nomadic Pastoralists Adopt Subsistence Strategies that Maximize Long-term Household Survival." *Behavioral Ecology and Sociobiology* 33: 329-334.

Mascarenhas, James. 1992. "Participatory Rural Appraisal and Participatory Learning Methods: Recent Experiences from MYRADA and South India." *Forests, Trees and People Newsletter* 15/16 (Feb. 1992): 10-17.

Mata, Jose I. 1992. *CTTA: A Method for Transferring Technology to Farmers, Planning and Implementation Guide*. Washington, D.C.: Academy for Educational Development.

McNeely, Jeffrey A., Kenton R. Miller, Walter V. Reid, Russell A. Mittermeier, and Timothy B. Werner. 1990. *Conserving the World's Biological Diversity*. Gland, Switzerland: IUCN (World Conservation Union/International Union for the Conservation of Nature and Natural Resources). Washington, D.C.: World Resources Institute, Conservation International, World Wildlife Fund-US, and The World Bank.

Metcalf, Simon. 1994. "The Zimbabwe Communal Areas Management Programme for Indigenous Resources (CAMPFIRE)." In *Natural Connections: Perspectives in Community-based Conservation*. Western, David, and R. Michael Wright, eds. 1994. Washington, D.C. and Covelo, Calif.: Island Press. pp. 161-192.

Middlestadt, Susan E., William A. Smith, and Richard Bossi. 1993. "Human Behavior and Biodiversity: An Approach to Program Management." Unpublished paper prepared for the Biodiversity Support Program by the Academy for Educational Development, Washington, D.C.

Middlestadt, Susan E., William A. Smith, Richard Bossi, and John Strand. 1993. "Rapid Assessment of Perceptions: Understanding Environmental Perceptions and Practices in African Communities." Unpublished paper prepared for the Biodiversity Support Program by the Academy for Educational Development, Washington, D.C.

Miller, Sandra E., Craig W. Shinn, and William R. Bentley. 1994. *Rural Resource Management: Problem Solving for the Long Term*. Ames, Iowa: Iowa State University Press.

Mkanda, Francis X., and Simon M. Munthali. 1993. "Public Attitudes and Needs Around Kasungu National Park, Malawi." Unpublished report.

Monroe, Martha, and Raymond De Young. 1993. "Designing Programs for Changing Behavior." *American Association of Zoological Parks and Aquariums (AAZPA) Annual Conference Proceedings*. pp. 180-187

Moulton, Jeanne, and Anne H. Roberts. 1993. "Adapting the Tools to the Field: Training in the Use of Focus Groups." In *Notes from the Field in Communication for Child Survival*, Seidel, Renata E., ed. 1993. Washington, D.C.: Office of Health, Bureau for Research and Development, U.S. Agency for International Development. pp. 31-37.

Murphree, Marshall W. 1994. "The Role of Institutions in Community-based Conservation." In *Natural Connections: Perspectives in Community-based Conservation*, Western, David, and R. Michael Wright, eds. 1994. Washington, D.C. and Covelo, Calif.: Island Press. pp. 403-427.

Mwangi, wa-Githinji, and Charles Perrings. 1993. "Social and Ecological Sustainability in the Use of Biotic Resources in Sub-Saharan Africa." *Ambio* 22:110-116.

Nagagata, Elizabeth Y. 1994. "Evaluation of Community-Based Conservation Education: A Case Study of the Golden-Headed Lion Tamarin Education Program in Bahia State, Brazil." M.Sc. Thesis, Michigan State University.

National Environment Secretariat (Government of Kenya), Egerton University, Clark University, and the Center for International Development and Environment of the World Resources Institute. 1990. *Participatory Rural Appraisal Handbook: Conducting PRAs In Kenya*. Washington, D.C.: World Resources Institute.

North American Association for Environmental Education. 1993. "Defining Environmental Education: The NAAEE Perspective." Washington, D.C.: North American Association for Environmental Education.

Noss, Reed F., and Allen Y. Cooperrider. 1994. *Saving Nature's Legacy: Protecting and Restoring Biodiversity*, Washington, D.C. and Covelo, Calif.: Island Press.

Oldfield, Margery L., and Janis B. Alcorn, eds. 1991. *Biodiversity: Culture, Conservation, and Ecodevelopment*. Boulder, Colo.: Westview Press.

Omari, C.K. 1990. "Traditional African Land Ethics." In *Ethics of Environment and Development: Global Challenge, International Response*. Engel, J. Ronald, and Joan Gibbs Engel, eds. 1990. Tucson, Ariz.: University of Arizona Press. pp. 167-175.

Orians, Gordon H. 1990. "Ecological Concepts of Sustainability." *Environment* 23(9): 10-15, 34-39.

Palmer, Paula R. 1994. "Empowering Indigenous Peoples to Preserve Their Forests and Cultures." *The Forum for Advancing Basic Education and Literacy*, June 1994: pp. 8-9, 15.

Park, P., M. Brydon-Miller, B. Hall, and T. Jackson, eds., 1993. *Voices of Change: Participatory Research in the United States and Canada*. Westport, Conn.: Bergin & Garvey.

Participants. 1993. "Toward Partnership in Development: A Handbook for PRA Practitioners." Report based on a PRA Training Workshop: Bulwer, Natal (19-26 April 1993) organized by the Natal Midlands Rural Development Network.

Passineau, J.F. 1975. "Walking the 'Tightrope' of Environmental Education Evaluation." In *What Makes Education Environmental?*, McInnis, N. and D. Albrecht, eds. 1975. Medford, N.J.: Plexus Publishing, Inc. pp. 370-407.

Pendzich, Christine. 1993. "Conflict Management and Forest Disputes —A Path Out of the Woods?" *Forests, Trees and People Newsletter* 20: 4-9.

Pomerantz, Gerri A. 1992. "Educational Strategies for Conservation." A report submitted to the U.S. Fish and Wildlife Service, Office of Training and Education.

Pomerantz, Gerri A., and Kathleen A. Blanchard. 1992. "Successful Communication and Education Strategies for Wildlife Conservation." *Transactions of the 57th North American Wildlife & Natural Resources Conference*. pp. 156-163.

Program for International Development and National Environment Secretariat. 1989. *An Introduction to Participatory Rural Appraisal for Rural Resources Management*. Worcester, Mass.: Program for International Development, Clark University; and Nairobi, Kenya: National Environment Secretariat, Ministry of Environment and Natural Resources [Government of Kenya].

Ricciuti, Edward R. 1993. "The Elephant Wars." *Wildlife Conservation* 96(2) (March/April): 14-34.

Rocheleau, Dianne, and Laurie Ross. 1993. "Farming the Forests, Gardening with Trees: Landscapes and Livelihoods in Zambrana-Chacuey, Dominican Republic." An ECOGEN Case Study. Worcester, Mass.: Clark University.

Rugh, Jim. 1992. "Self-Evaluation: Ideas for Participatory Evaluation of Rural Community Development Projects." Oklahoma City, Okla.: World Neighbors. (Reprint of 1986 publication) 47pp.

Schindler, Bruce, Peter List, and Brent S. Steel. 1993. "Managing Federal Forests: Public Attitudes in Oregon and Nationwide." *Journal of Forestry* 91(7): 36-42.

Seidel, Renata E., ed. 1993. *Notes from the Field in Communication for Child Survival*. Washington, D.C.: Office of Health, Bureau for Research and Development, U.S. Agency for International Development.

Shands, W.E., V.A. Sample, and D. Le Master. 1990. "National Forest Planning: Searching for a Common Vision." Washington, D.C.: U.S. Government Printing Office.

Sirmon, Jeff, William E. Shands, and Chris Liggett. 1993. "Communities of Interests and Open Decisionmaking." *Journal of Forestry* 91(7): 17-21.

Smith, Robert Leo. 1992. *Elements of Ecology*, Third Edition. New York: HarperCollins.

Smith, William A. 1994. "Behavior, Social Marketing, and the Environment." Unpublished paper presented at IUCN General Assembly Workshop on Changing Attitudes and Practice, Buenos Aires, Argentina; January 1994.

Smith, William A., and Susan E. Middlestadt. 1993. "The Applied Behavior Change (ABC) Framework," In Smith, W.A., et al., eds. 1993. op. cit., pp.19-34.

Smith, William A., Michael J. Helquist, Ann B. Jimerson, Kathryn Carovano, and Susan E. Middlestadt, eds. 1993. *A World Against AIDS: Communication for Behavior Change*. Washington, D.C.: Academy for Educational Development.

Steelquist, Robert. 1993. "Evaluation—Right from the Start: A Workbook on Environmental Education Program Design and Evaluation." Unpublished workbook developed for the U.S. Fish and Wildlife Service, Office of Training and Education.

Swanson, Richard A. 1995. "Development for Conservation: Monitoring and Evaluation." Report for the USAID Madagascar SAVEM Project, distributed by Tropical Research and Development, Inc., Gainesville, Fla.

Thomas-Slayter, Barbara, Andrea Lee Esser, and M. Dale Shields. 1993. *Tools of Gender Analysis: A Guide to Field Methods for Bringing Gender into Sustainable Resource Management*. Worcester, Mass.: International Development Program, Clark University.

UNESCO. 1991. "A Universal Environmental Ethic: The Ultimate Goal of Environmental Education." *Connect: UNESCO-UNEP Environmental Education Newsletter* 16(2): 1-5.

UNESCO-UNEP. 1985. *A Problem-Solving Approach to Environmental Education*. Environmental Education Series 15. Federal Republic of Germany: UNESCO-UNEP International Environmental Education Programme.

Uphoff, Norman. 1992. "Approaches and Methods for Monitoring and Evaluation of Popular Participation in World Bank-Assisted Projects." Washington, D.C.: Paper prepared for World Bank workshop on participatory development.

USAID. 1993a. *Towards a Sustainable Future for Africa: Improved Natural Resources Management under the Development Fund for Africa, 1987 to 1993*. Technical Paper No. 5, April 1993. Washington, D.C.: Office of Analysis, Research, and Technical Support, Africa Bureau, U.S. Agency for International Development.

———. 1993b. *The Substance Behind the Images: A.I.D. and Development Communication*. Washington, D.C.: U.S. Agency for International Development.

———. 1993c. "Environmental Education and Communication (GreenCOM) Project: Project Paper." Washington, D.C.: Bureau for Global Programs, Field Support, and Research; U.S. Agency for International Development.

———. 1992. *Plan for Supporting Natural Resources Management in Sub-Saharan Africa: Regional Environmental Strategy for the Africa Bureau*. Washington, D.C.: Office of Analysis, Research and Technical Support, Africa Bureau, U.S. Agency for International Development.

Weber, Fred R. 1992. "The NRM Framework: What It Is, What It Does, and How It Works, with an Example from the Field." In USAID, 1992, op. cit.

Wells, Michael, Katrina Brandon, and Lee Hannah. 1992. *People and Parks: Linking Protected Area Management with Local Communities*. Washington, D.C.: The World Bank, World Wildlife Fund, and U.S. Agency for International Development.

Whyte, Anne V. T., and in cooperation with Scientific Committee on Problems of the Environment. 1977. *Guidelines for Field Studies in Environmental Perception*, Man and the Biosphere Program Technical Notes 5. Paris: United Nations Educational Scientific and Cultural Organization (UNESCO).

Wondolleck, Julia M. 1988. *Public Lands Conflict and Resolution: Managing National Forest Disputes*. New York and London: Plenum Press.

Wood, David S., and Diane Walton Wood. 1990. *How to Plan a Conservation Education Program*. Washington, D.C.: Center for International Development and Environment of the World Resources Institute and U.S. Fish and Wildlife Service.

World Bank. 1994. "Social Assessment: Incorporating Participation and Social Analysis into the Bank's Operational Work." Note from The World Bank, Environmental and Social Policy Division (ENVSP), May 10, 1994.