

# **Starting with Behavior**

**A Participatory Process  
for Selecting Target Behaviors  
in Environmental Programs**

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# Foreword

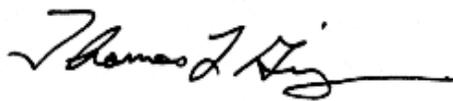
**O**n rare occasions, we have the opportunity to participate in the development of a truly extraordinary product, one which promises Agency and possibly worldwide impact. Such is the case, we believe, with the publication of *Starting with Behavior: A Participatory Process for Selecting Target Behaviors in Environmental Programs*.

The report describes our mission's attempt to develop a practical, participatory methodology for selecting and measuring observable changes in behavior among men and women, in order to promote the sustainable use of agricultural and natural resources, and conservation of biodiversity, and the prevention of pollution.

For too long, we have struggled with the dilemma of trying to monitor, measure, and determine whether sustainable resource management is being achieved. With no scientifically tested and accepted methodology in place, how does one determine whether our clients and beneficiaries are practicing sustainable resource management?

In an attempt to answer this question, and with a modest expenditure of resources, the mission obtained assistance from the Global Bureau's Environmental and Education Communication (GreenCom) Project. Working with world-class technical assistance provided by the Academy for Educational Development through GreenCom, a local team (composed of SUBIR Project extensionists, community members, and CARE/Ecuador staff) designed, tested, and implemented a rigorous methodology for monitoring and measuring observable changes in behavior among men and women, related to the sustainable use of land resources in the buffer zones surrounding Ecuador's 200,000 hectare Cotacachi-Cayapas Ecological Reserve. The methodology has since been adopted for application to other major project components and non-USAID funded programs addressing sustainable resource management.

While we are aware that no silver bullets exist which will enable our partners to resolve every environmental concern, the report provides a blueprint for developing and testing a methodology useful beyond the Ecuadorian experience. That is our hope in joining with GreenCom, the Academy, and USAID's Global Bureau in making this publication available.



Thomas Geiger, Director  
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*Begin difficult things while they are easy.*

*Do great things while they are small.*

*The difficult things of the world must once  
have been easy.*

*The great things must once have been small.*

*A thousand mile journey begins with one  
step.*

*Lao-tse  
604 B.C.*

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## Preface

**T**his guide was developed as a tool for people working in environmental programs that include education, training, communication, or promotional activities. Those who might find it useful would include:

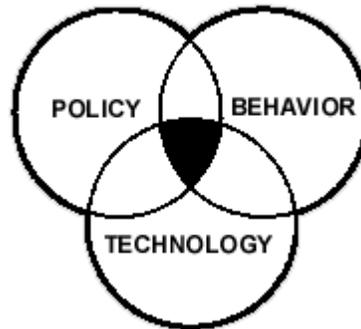
- ◆ Governmental organizations that provide services and support for natural resource conservation, agriculture, or national parks (ministries of natural resources, agriculture, forestry, marine resources, or national parks);
- ◆ Governmental or private organizations that provide services related to water, electricity, or solid waste (departments of public works, electric companies, or solid waste management companies);
- ◆ Environmental non-governmental organizations (NGOs) and private voluntary organizations (PVOs);
- ◆ Businesses and industries; and
- ◆ Community groups and individuals.

The guide describes a practical, participatory process that can be used to select target behaviors and develop effective education, communication, and promotional strategies. The process can be applied to any type of environmental program that is working with individuals, groups, or organizations to conserve the environment or resolve environmental problems. The process can be applied at any time during a program as a way of increasing participation and strengthening education and communication activities.

### Why Select Target Behaviors?

While environmental awareness is globally at an all-time high, key natural resources are being depleted at an unprecedented rate. Many people now know that they should protect and conserve water, forests, air, and other resources, but they do not necessarily *act* on that knowledge. Many factors, of which the lack of information is only one, influence why people do or don't carry out the many actions necessary to protect and conserve our planet's natural resources. Sustainable use of these resources will depend on three inter-related elements:

- ◆ **Improved technologies** (services, products, and practices) that provide economic alternatives and foster economic development, as well as protect the environment;
- ◆ **Enforced policies and laws** that regulate and support those technologies; and
- ◆ **Changes in the actions or behaviors** of individuals, groups and organizations in response to available technology and policy.



In order to determine exactly how these elements can be put into place to reduce or resolve a specific environmental problem, we need to start with behavior and define exactly what people need to do to resolve that problem. What behaviors—single, observable actions that people would adopt under specific circumstances—should the environmental program introduce, teach, and support to reduce or resolve this specific environmental problem? Once we have defined these behaviors, we can identify the factors that influence their adoption and develop strategies that are more effective because they address and build on those specific factors.

This guide describes a practical process that can be used to select target behaviors, identify the factors that influence their adoption, and design strategies that address those specific factors.

### **Why Use a Participatory Process?**

Participation is the key to environmental program success. The needs, values, and constraints faced by the various stakeholders of an environmental program must be the foundation upon which effective strategies are built. Too often, however, environmental programs are designed at the central or regional levels, without involving the individuals, groups, or organizations they will affect. The process described in this guide facilitates the participation of all the various stakeholders—the individuals and groups who might be

affected by the environmental program, as well as those who will be implementing it. Actively involving the stakeholders from these various levels, sectors, and disciplines encourages consensus among the diverse groups of individuals needed to introduce, support, perform, and maintain target behaviors. It creates a new kind of partnership-among technical experts, communication and education specialists, and the people who will be affected by the program—that is necessary for the environmental program's success.

The participatory process described in this guide can assist the environmental program to:

- ◆ **Empower people to take action:** Many countries have implemented successful education and communication activities that have increased awareness of the need to protect and conserve natural resources. People are now ready for action, but they need and want to know what they can do that might make a difference. For example, during recent focus groups connected with an environmental awareness campaign in El Salvador, participants repeatedly said that they were concerned about the degradation of their environment, but they didn't know what they could do to solve these problems. In response, communicators changed their strategy from an awareness campaign to a campaign promoting specific behaviors which urban and rural people could carry out to protect and conserve their natural resources.
- ◆ **Build on what people are already doing correctly:** The process used to define target behaviors assists in identifying what people are already doing that is similar to the target behaviors. Successful education and communication activities build on what people are already doing correctly, rewarding and shaping their behavior towards the next step. This also makes it more likely that the environmental program is promoting behaviors that are compatible with local culture and social norms.
- ◆ **Develop practical methods to measure behavior change:** The behavioral observation instrument developed during the selection of target behaviors can be refined and applied in several ways to strengthen and evaluate the impact of the environmental program. For example, it can be applied before and after training courses to assist trainers in understanding which skills participants are mastering and which still need further emphasis in follow-up courses and supervisory visits. Implementors can apply the observation instrument periodically throughout the program as a cost-effective, practical method to monitor progress and to fine-tune mid-course strategies. Finally, the instrument can be applied as a pre- and postevaluation technique to measure the environmental program's impact on performance of the desired behavior.
- ◆ **Identify intermediate indicators of a program or project's impact:** USAID's Environmental and Natural Resources Objectives-reduced rate of loss of biodiversity, reduced urban and industrial pollution, increased production and use of environmentally sound energy, reduced degradation of coastal and other water

resources, and maintenance of a viable resource base for agriculture, forestry, and ranching—are long range. Direct measurable impact may not be apparent within the time frame of a specific project. Achievement of these objectives—and documenting impact—may also be difficult and expensive to measure. Finally, other factors outside the control of a specific project might affect reaching those objectives. As described in the accompanying case study, target behaviors can be used as intermediate indicators of an environmental program's impact.

- ◆ **Develop more effective education, communication, and promotional strategies:** Audience research conducted during the process of selecting target behaviors assists in the development of communication strategies that are more effective because they address and build on specific factors influencing the adoption of the target behaviors.
  
- ◆ **Ensure that equity issues are addressed:** Participatory processes deliberately seek out minority voices that may also be stakeholders but are often left out of decisionmaking. Included are vulnerable groups such as women, indigenous peoples, and people who might be excluded for reason of color, race, or ethnicity. Gender issues, in particular, should always be addressed in this process, and serve to highlight both men's and women's social roles that affect development.

## How to Use this Guide

This guide consists of two parts:

- ◆ **Section One** describes the participatory process for selecting target behaviors and provides a conceptual framework for the methodology. This section describes the steps of the process and how to put them into practice, providing examples of their application.
  
- ◆ **Section Two** recounts a case study on the application of the process to identify target behaviors and develop education and communication strategies for an environmental project in Ecuador. It provides a more in-depth description of how the steps of the participatory process are implemented in a real-life setting.

# **Section I**

## **The Participatory Process**

### **For Selecting Target Behaviors**

Major portions of this section were selected or adapted from Judith A. Graeff, et al.,  
Communication for Health and Behavior Change, A Developing Country Perspective (San  
Francisco, 1993)

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**T**his guide outlines a systematic process for identifying and selecting behaviors that are critical for achieving impact on an identified environmental goal, and for understanding and influencing the factors that help or hinder a group of people from adopting those behaviors. This section describes four basic steps in the participatory process for selecting target behaviors:

- ◆ Identify the "ideal behaviors";
- ◆ Conduct research with "doers" (men and women who are currently performing the ideal behavior) and "non-doers" (men and women who are currently *not performing* the desired ideal behaviors);
- ◆ Select and negotiate target behaviors; and
- ◆ Develop strategies.

The following describes each step of this process.

## Define the Ideal Behavior

**A**lthough environmental practices frequently appear simple, they are actually complex sets of decisions and actions which must be thoroughly understood in order to develop effective education and communication strategies. The process begins, therefore, with an analysis of a given environmental practice and a definition of the "ideal behaviors"-a detailed list of discrete actions in their technically-prescribed ideal form. A **behavior** is a single, observable action that a person takes under specific circumstances. An **ideal behavior** is a single, observable action that technical experts consider people need to perform in order to reduce or help resolve a specific environmental problem. An **environmental practice** is a series of several related behaviors which, taken together, could have an impact on the environmental problem.

For example, **recycling garbage** is an environmental practice. It needs to be broken down into single, observable actions in order to be measurable. Ideal behaviors in the environmental practice **recycling garbage** might include:

- (1) Separate glass, cans, paper, and organic material;
- (2) Store glass, cans, paper, and organic material in separate containers until the appropriate pick-up day;

- (3) Put garbage in plastic bags for collection;
- (4) Put out the appropriate material (glass, cans, paper, and/or organic material) on the correct day:
  - Glass and cans-Tuesday
  - Paper-Wednesday
  - Organic materials-Monday and Thursday;
- (5) Put organic garbage out for collection in the morning so that dogs and other animals do not scatter it during the night;
- (6) If garbage is not collected, call the Recycling Hotline, 555-1234.

Each of these ideal behaviors is a single, observable action that families should take to comply with the practice of recycling garbage.

**Correct agrochemical use** is another environmental practice. It would also need to be broken down into single, observable actions in order to be measurable. Some of the ideal behaviors in the environmental practice of **correct agrochemical use** might include:

- (1) Store pesticides out of reach of children and animals;
- (2) Use the correct amount of water to mix the pesticide (as indicated on the label);
- (3) Use the correct amount of pesticide (is indicated on the label);
- (4) Wear shoes which cover the entire foot (not sandals) while mixing and applying the pesticide;
- (5) Wear gloves while mixing and applying the pesticide and washing the container after use;
- (6) Apply only when there is little or no wind.

## **The Multi-Part Team**

Defining the ideal behaviors is accomplished through the work of a multidisciplinary, multisectoral, multilevel, participatory team (hereafter referred to as a Multi-Part Team).

- ◆ **Multidisciplinary:** Team members should include environmental program decision- makers, technical specialists knowledgeable of the environmental problem being addressed, educators, communicators, and social science

researchers, including a gender specialist. Decision-makers can assist in reviewing policy concerning a specific environmental issue for its behavioral as well as financial and logistical implications. Technical specialists provide a scientific orientation to the environmental problem and can assist the team in defining which behaviors have the most potential for impact on that problem. Educators and communicators can assist in developing training, mass media campaigns, and other strategies to teach and motivate the adoption of the target behaviors. Anthropologists and other social science researchers provide in-depth understanding of current beliefs, practices, and social structures which might influence environmental practices.

- ◆ **Multisectoral:** Environmental programs frequently affect or involve several organizations. These could include governmental organizations that provide services and support for natural resource conservation, agriculture, or national parks (ministries of natural resources, agriculture, forestry, marine resources, or national parks); governmental or private organizations that provide services related to water, electricity, or solid waste (departments of public works, electric companies, or solid waste management companies); environmental private voluntary organizations (PVOs); industries and businesses; and community organizations and groups.
  
- ◆ **Multilevel:** Team members should include representatives of levels involved in and affected by the environmental program. Environmental programs are frequently designed by technical experts at the national or regional level without involving the individuals and groups they will affect. The Multi-Part team should include representatives of the target audience—both women and men—the people who will be affected by the program and actually performing the target behaviors. They can provide invaluable insights into the feasibility of adopting the ideal behaviors and can suggest more realistic alternatives. In putting together these representatives, care should be taken that women and other vulnerable groups are represented, and that elite groups with vested interests are not the dominating voices.

The Multi-Part team is the key to the success of this process. Working together as a team generates participation from all of the stakeholders. It develops consensus among the diverse groups needed to introduce, support, perform, and maintain target behaviors. It creates a new kind of **partnership** among the various disciplines, sectors, and levels who will be involved in and affected by the environmental program.

"Membership" of the Multi-Part team will depend on the environmental problem being addressed. **Equal representation by men and women is essential to ensure that different gender issues and inputs are explored.**

The following are examples of Multi-Part teams that could be formed to address different environmental problems.

- ◆ **Sustainable land use:** minister of agriculture representative; national or regional director of extension; extension agents from the target region; agricultural educators and communicators; anthropologists and/or other social science researchers (e.g., gender specialists) who have conducted research related to agriculture and/or social behaviors in the target region; representatives of NGOs working in agriculture in the target region; and farmers (both men and women) from communities who will be affected by the program.
  
- ◆ **Deforestation:** minister of national parks or forestry representative; national or regional director of forestry; forestry or park extensionists from the target region; agricultural or park educators and communicators; anthropologists and/or other social science researchers who have conducted research related to land use and deforestation or social science researchers familiar with gender issues related to forest management; representatives of environmental NGOs; representatives of logging companies; representatives of community groups; and men and women from communities who will be affected by the program.
  
- ◆ **Recycling:** director of public works of the city government; director of public relations and/or other educators and communicators; representatives from local environmental PVOs; technical specialists in recycling systems and/or representatives from other cities who have recycling programs; anthropologists and/or other social science researchers who have conducted research in the city/town; social scientists familiar with gender issues regarding recycling/trash collection; trash collectors; representatives from community organizations; and men and women who will be affected by the recycling program.
  
- ◆ **Industrial pollution:** appropriate ministry designate; technical experts in the specific industrial pollution area (water, air, etc.); chief operating officers and other key technical staff of the industries; workers (men and women) in those industries; social scientists and medical personnel familiar with the differential impact of industrial pollution on men and women (whether observed in the workplace or in the larger community) and representatives of groups and community members who are affected by the industrial pollution.

Consensus is reached on the "ideal behaviors" in a series of meetings or workshops with the Multi- Part team. The communicator's role in these meetings is to facilitate the process of defining the ideal behaviors. The communicator should encourage team creativity in considering various alternatives. Focused research will provide information about the target audience to fill in the gaps in the team's analysis.

## HINTS FOR DEFINING THE IDEAL BEHAVIOR

- ◆ Have the Multi-Part team review and refine the list of ideal behaviors several times. They may need to have several meetings before they can reach a consensus.
- ◆ Involve as many of the Multi-Part team members (women and men) as you can in each meeting
- ◆ First ask the team to define the environmental problem and overall objective of the environmental communication program in order to solve that problem, Then begin defining the ideal behaviors--the single observable actions people should take to reach this objective.
- ◆ Developing the list of ideal behaviors also helps the team begin to identify target audiences. Target audiences are the specific groups of people who will be reached or influenced by the environmental program. **Primary audiences** are those people who would actually perform the target behaviors. **Secondary audiences** are people or groups who influence the primary audience or who could teach, support, and reinforce their behavior.

For example, in a recycling program, team members might feel that women would perform certain behaviors, while men, children, or other family members might perform others. The audience research with doers and non-doers will assist the team to refine these hypotheses and defining the specific target audience for each behavior.

- ◆ Target groups should be disaggregated by gender. Generic words like "families," "people," "farmers" can mask gender-specific concerns and should be put aside in favor of "men and women farmers."
- ◆ Ideal behaviors should be expressed as single, observable events. Start the definition of each ideal behavior with an "action" verb.
- ◆ Put only one behavior in each statement. If there is an "and" in the sentence, make it into two separate behaviors.
- ◆ Focus on what the **primary audience** should do, not what should be done to or for the primary audience. Words to avoid include: teach, motivate, encourage, train, etc.

These describe what the environmental program will do for the primary audience, not what the primary audience should do as a result of the program. For example, "motivate families to recycle garbage" describes what the implementors will do to create compliance, not what the families should do.

- ◆ Ask team members to "role play" the environmental practice during the workshop and to identify the behaviors necessary to perform it correctly. The team members can learn a great deal concerning the complexity of a practice by doing it themselves.
- ◆ Be specific! Be aware of vague and unmeasurable words such as "improve" or "correctly." These terms involve several behaviors and are not directly observable. They need to be further broken down or refined into smaller, actionable behaviors that the target audience should do to "improve" or "act correctly." For example, "improved national park usage" would be very difficult to measure because it allows a great deal of subjective interpretation. The team would need to determine what specific actions people should take to meet the criteria of "improved." Ideal behaviors for "improved national park usage" might include "camp only in designated areas," "place all trash in designated receptacles," "maintain camp site clean of trash," "walk only on designated hiking trails," and "do not take any plants or animals from the national park."
- ◆ Don't be concerned if there is initially a lot of disagreement about what the ideal behaviors should look like. This is a normal and healthy part of the process. Let the team members discuss as much as they need to, but keep reminding them that they need to reach a consensus on what they would ideally like the target audience to do to resolve or reduce the specific environmental problem.
- ◆ If, after several meetings, the Multi-Part team is unable to define the ideal behaviors, this may not be the appropriate time to develop or strengthen education and communication activities. The team may not have enough scientific or technical information to define what behaviors could have an impact on the environmental problem. In this case, they may need to support more research before defining behaviors. Or various stakeholders in the team may have perspectives and needs that are incompatible. In this case, the team may want to consider a more formal conflict resolution activity that can help them reach consensus.

A list of ideal behavioral practices and behaviors for sustainable agriculture is provided in the case study in the following section.

## Conduct Research with Doers and Non-Doers

Once the team has defined the ideal behaviors, they need to conduct research with the target audience. This study should be conducted with a small number (10- 15) of "doers" and a small number (10-15) of "non-doers." "Doers" are men and women who are regularly **performing** the ideal behavior. (They are often called "adopters" or "positive deviants" because they deviate from the norm in a positive direction.) "Non-doers" are men and women who are **not performing** the ideal behaviors ("non-adopters"). It is important to conduct the study with both men and women, even though both sexes may not be involved in actually performing the specific ideal behaviors, because men and women could have very different perspectives on the particular environmental problem. Understanding the differences between men's and women's needs and perspectives is critical to the selection of effective strategies. Once again, while conducting research (such as focus groups), it is preferable to meet with women separately from men.

In some cases, especially when the environmental program is being initiated, the team may be unable to identify anyone who is performing the ideal behaviors. In such a case, they would need to teach a small group of people (five to ten) to perform the ideal behaviors and ask them to continue performing them for a period of time (usually several days). They would then revisit these people to observe the behaviors being performed and to discuss how they have adapted them to meet their own needs, resources, and abilities. Such a study is called a **behavior trial**.

## Why Conduct Audience Research?

Audience research can assist the Multi-Part team in understanding the specific factors that influence doers' and non-doers' behaviors. The team can then develop strategies that are more effective because they address and build on those factors.

Specifically, the study assists the Multi-Part team to identify:

- ◆ What are men and women currently doing in relation to the ideal behaviors? What are their actual behaviors?
- ◆ Why do people do what they do? Why are doers and non-doers different? What factors have most influenced doers to perform the ideal behaviors and non-doers not to perform them?

The answers to these questions will assist the Multi-Part team in the next steps of the process—selecting and negotiating target behaviors and developing effective strategies.

Many factors influence why people act the way they do. These factors vary depending on the target audience and ideal behaviors. For example, the factors that influence whether farmers adopt sustainable agricultural practices would be very different from those that influence whether urban families conserve water and electricity or recycle trash. The research with doers and non-doers will help the team determine which factors are the most important for **this particular target audience** to perform the ideal behaviors related to **this specific environmental problem**.

Factors that could influence the adoption of ideal behaviors fall into a number of categories. Audience research assists the team in identifying which factors are the most important for a particular target audience and target behaviors.

◆ **Availability of appropriate technologies** to support positive practices is a key factor in adoption of ideal behaviors. Appropriate technologies can include:

- Services, such as garbage collection for a recycling program or training and technical assistance in community-based resource management;
- Products, such as stoves that use less firewood and reduce deforestation; higher yielding crop varieties that can be grown as economic alternatives for intensified agriculture; and appropriate coastal resource management technologies such as artificial reefs and fish attractors; and
- Practices, such as conserving electricity and water, reforestation, and correct pesticide use, and community-based enforcement of access to coastal resources.

Appropriate technologies need to be accessible, easy to use, compatible with people's lifestyles and culture, have a relatively low cost in comparison to existing technologies and behaviors, and provide an observable or perceivable benefit to the person using them. When people's "non-desirable practices" are linked directly to their family's livelihood, such as farming or logging, technologies need to provide equal or better income than current ones.

The lack of appropriate technologies can be a critical barrier to sustained behavior change. Audience research can identify if the absence of the ideal behaviors or performance of non-desirable behaviors is due to barriers, such as the following:

- An alternative technology is needed. The research can assist in identifying what type of technology would be most appropriate for this specific target audience.

- The technology is not in the hands of appropriate people. Often men are trained in the use of a particular technology, but women have the social responsibility for that activity. The technological benefit is not reaching the group most in need.
  - An existing technology is inaccessible, expensive, incompatible with current practices or context, too complex, or lacks perceivable benefits. In this case, the research can assist in identifying what changes could be made in the technology to decrease these barriers.
- ◆ **Policies and laws** which regulate and support the application and use of appropriate technologies are essential to sustained behavior change. Nonexistence of policies and laws or lack of enforcement can also be critical barriers to sustained behavior change. Audience research can identify if non-desirable behaviors are due to the absence or non-enforcement of policies and laws. It can also assist in identifying what type of policy change would be necessary to support and maintain the target behaviors. Policies and laws can differentially impact men and women, and this assumption should be part of such research.
- ◆ **Antecedents** are events which set the stage for or trigger behavior.<sup>1</sup> Important antecedents include *knowledge* (information) concerning when and how to carry out a behavior and *skills* (the ability to perform certain actions) needed to actually perform them. The audience research can identify what knowledge, skills, and other antecedents trigger people's *current behavior*. It can also determine what knowledge, skills, and other antecedents people need and currently lack to perform the *ideal behaviors* correctly.
- For example, fisherfolk may not know the exact dates of a specific fishing season or the amount of fish they are permitted to catch. Similarly, they may not be aware of a municipal access regulation prohibiting fishing in certain areas, or they may not know the exact boundaries of the municipal waters concerned. Farmers may not have the skills they need to apply pesticides correctly, or fisherfolk may not have the skills they need to construct and maintain artificial reefs or fish attracting devices.
- ◆ **Consequences are environmental** events that follow a behavior and either strengthen, weaken, or stop it. Generally, people tend to repeat behaviors that lead to positive results or benefits (positive consequences) and to avoid behaviors that produce negative results.<sup>2</sup>

- A consequence that immediately follows a behavior is far more powerful in influencing it than one that occurs after a time delay.<sup>3</sup> For example, farmers observe the immediate consequence of the elimination of insects and fungi after using agrochemicals. This consequence is more powerful in influencing their behavior than the potential future negative consequence of contaminating their soils and water tables with toxic chemicals.
- The more salient, relevant, important, or meaningful a consequence is to the individual, the more powerful is its influence on that individual's behavior.<sup>4</sup> For example, a mother may find the consequence of her children's approval of her recycling to be more rewarding than the knowledge that she is reducing the amount of trash accumulating in the landfill.
- A concrete consequence is more powerful than an abstract one.<sup>5</sup> For poor farmers who cut timber in a national park, or poor fisherfolk who overfish local waters, the concrete consequence to their family income is more powerful than the abstract consequence of conserving natural resources for future generations. An electric bill which visually highlights the amount a family has spent on electricity this year compared to last year is more concrete than the concept of conserving energy.
- However, it is important to understand the consequences of the ideal behavior to both men and women. New and alternative technologies, which are frequently used by and provide positive consequences to men, can cause negative consequences to women and children. For example, changing agricultural practices from traditional to income-generating crops could cause the negative consequence of reducing the amount of food produced for home consumption, increasing malnutrition in women and children. Providing alternative incomes to fishermen through eco-tourism could cause negative consequences to women if their income depends on fish processing and marketing. Reduced women's income would in turn affect family wellbeing.

Audience research can identify what positive consequences a doer obtains from his or her behavior that helps to maintain it, and what consequences a non-doer experiences from less desirable behaviors.

- ◆ **Perceived consequences:** Sometimes consequences are "inside people's minds"; that is, they are not directly observable, but are rather perceived or felt. For example, a woman who does not participate in a recycling program (a non-doer) may believe that recycling would take too much time and effort, even though she has never tried it. The audience research can identify what consequences doers and non-doers perceive from their actual behavior and what consequences non-doers perceive they would obtain from trying the new ideal behavior.
  
- ◆ **Perceived social norms,** or whether individuals perceive that people important to them really want them to adopt a new behavior, can be profound influences. "Important others" might include parents, friends, relatives, neighbors, and religious professionals. Audience research can identify which important others approve or disapprove of what people currently do. Research with non-doers can identify which important others might approve or disapprove if they tried the new ideal behaviors. For example, farmers might be more willing to reduce the amount of pesticides they use if their neighbors think it is important and approve when they do it. Women may be influenced by different peer pressures than men, and programs often need to target these groups with different messages.
  
- ◆ **Perceived skills:** How skilled a person feels about managing the new behavior (self-efficacy) can influence his or her behavior and can be changed to facilitate behavior change. For example, to recycle garbage consistently and with ease, individuals not only have to be able to do it, they have to think that they can. Audience research can identify whether people perceive they can perform ideal behaviors.

## Research Techniques

Research techniques used to conduct the study should include structured observation combined with qualitative verbal techniques. The key to good field research is asking the right questions of the right people. This guide discusses how to conduct individual interviews and group discussions. The basic skills required for these techniques can be applied to other participatory qualitative research approaches such as mapping, oral histories, transects, and seasonal and daily calendars.

- ◆ **Structured observation:** Structured observation is a research technique in which researchers observe people's actions or the results of those actions using a previously designed observation form (usually an observation checklist). Researchers need not rely on self-reporting to learn how the person behaves in his/her natural setting. Rather, they have direct evidence of this behavior.<sup>6</sup>

The observation instrument can be refined based on experiences during the initial research and applied again during training, monitoring, and evaluation of the environmental program. For example, it can be applied before and after training courses to assist trainers 'in understanding which skills participants are mastering and which still need further emphasis in follow-up courses and supervisory visits. Implementors can apply the observation instrument periodically throughout the program as a cost-effective, practical method to monitor progress and to fine-tune mid- course strategies. Finally, the instrument can be applied as a pre- and post-evaluation technique to measure the environmental program's impact on the desired behavior change.

- ◆ **Qualitative research techniques:** *Focus groups* are a qualitative research technique in which a moderator or facilitator leads a small, homogeneous group of respondents through a discussion on a selected topic. The facilitator uses a prepared list of probing questions to collect information, but at the same time allows participants to talk freely and spontaneously about the selected topic.

*Individual in-depth interviews* are conducted one-on-one between a respondent (the person being interviewed) and a trained interviewer and are characterized by extensive probing and open-ended questions.

## HINTS FOR CONDUCTING STRUCTURED OBSERVATION

- ◆ Observe as many of the behaviors as possible. There is usually a great deal of difference between what people say and what they actually do.
- ◆ To design the structured observation, simply turn the list of ideal behaviors into an Observation Checklist.

If the ideal behaviors describe the steps of a practice, the researcher asks the person to perform the practice and checks off those behaviors the person executes. For example, an Observation Checklist describing the steps of the practice "correct pesticide use" might include the following:

- \_\_\_ Stores pesticides out of reach of children and animals.
- \_\_\_ Uses the correct amount of water (as indicated by the label).
- \_\_\_ Uses the correct amount of pesticide (as indicated by the label).
- \_\_\_ Wears shoes which cover the entire foot (not sandals) while mixing/applying the pesticide.
- \_\_\_ Wears gloves while mixing and applying the pesticide.
- \_\_\_ Does not apply when windy.

A sample *Behavioral Steps Observation Checklist* which describes more completely the steps of correct pesticide use is included in Annex B.

If an ideal behavior describes the *results of a practice* (e.g., an agricultural practice) the researcher only needs to observe these results. For example, an Observation Checklist describing the results of agricultural practices might include the following:

- \_\_\_ Incorporates organic material into the soil.
- \_\_\_ Plants crops on the contour.
- \_\_\_ Plants trees around the plot (wind breaks).
- \_\_\_ Plants living fences on the contour.
- \_\_\_ Has a compost box.

A sample *Behavioral Results Observation Checklist* which describes more completely the results of improved agricultural practices is included in Annex A.

- ◆ **Field testing the instrument:** You may need to field test the instrument several times and make the needed changes in the format and vocabulary. The instrument should be as simple and practical as possible so that it can be useful as a monitoring and evaluation tool throughout the environmental program.
  
- ◆ **Selecting the sample:** A research sample is the portion of the target audience who will be observed and interviewed. Two major factors are involved in determining a sampling approach—cost and diversity of the target audience. What is proposed here is one possible approach to sampling that has been generally associated with quantitative research. Based upon this approach, the sample should preferably be representative, i.e., it should reflect the characteristics of the target audience. (For example, if the target audience includes farmers working on slopes and flatlands, the sample should include both categories of farmers. There are different ways of assuring that this takes place.) Selecting a sample is a specialized, technical process. Social scientists on the Multi-Part team should take the lead role in selection.

To select the sample, first define the characteristics of the target audience. The characteristics of gender (males and females) and performance of the ideal behaviors (doers and non-doers) have already been discussed. At a minimum, conduct observations and in-depth interviews with 10- 15 men/women who perform the ideal behaviors (doers) and 10- 15 men/women who do not perform the ideal behaviors (non-doers). However, there may be other characteristics or criteria that will be important in the selection. For example, in a recycling program, people's income (and therefore how much trash they generate) would be an important characteristic to consider. In this case, you would want upper class doers and non-doers, middle class doers and non-doers, and lower class doers and non-doers, each of which would be disaggregated by gender, resulting in 12 groups. Similarly, in an agricultural extension program, selecting farmers with big and small plots, or engaged in subsistence vs. cash crop farming, or cultivating in lower or higher altitudes, would be important.

Once you have determined the categories of people to be interviewed, select the sample within each group. There are several ways to select a sample.

- **Random:** Respondents are selected randomly from a list of all of the potential respondents in a specific area. For example, to select a random sample of doers and non-doers in a recycling program, the recycling company could provide the names of families who regularly participate and those who do not. The names on each list would be numbered and 10-15 families would be randomly selected in each group.
- **Systematic:** This is a variation on the random sample in which one house out of every "x" houses (one house out of five, for example) is interviewed. The number "x" is randomly selected. For example, In a sample selected for a recycling program in which socio-economic status was an important characteristic, the researchers would make lists of upper, middle, and lower class neighborhoods. The neighborhoods in each group- upper, middle, and lower class-would be numbered and one neighborhood in each would be selected randomly. If neighborhoods are big, the next step is to select blocks in those neighborhoods. Block selection should be done randomly. After the block selection, the next step is to determine how many houses should be visited to obtain the desired sample size. The researchers would visit those neighborhoods and, starting from a predetermined corner in the block, visit every x number of houses (the number that had been randomly selected) until they had observed and interviewed 10- 15 men and women in houses that reported they recycled (doers) and men and women in 10- 15 houses that reported they did not recycle (non-doers). In visiting households it is important that men and women are interviewed separately.
- **Convenience:** The respondents are selected on the basis of their accessibility and convenience for the researcher. Respondents are selected in central locations where people similar to the target audience gather. Convenience samples are appropriate if the ideal behaviors are ones that are performed in public places rather than in the home or on the farm. For example, a convenience sample would be appropriate for audience research on littering. In this case, the researchers would wait in a central location where there is litter in spite of the presence of garbage bins-a city park or a soccer field, for example. They would observe who places their waste in the garbage can (doers) and who does not (non-doers) and conduct in-depth interviews with 10- 15 men and 10- 15 women in each group. Gender disaggregation is also important in convenience sampling. For farmers, a convenience sample may be obtained at market places on a busy day.

- ◆ **Selecting researchers:** Researchers must be carefully selected since the validity of the data gathered relies primarily on the quality of their work. Sometimes people directly involved in a program would be best at conducting the research.<sup>7</sup> For example, extensionists can observe agricultural practices or park guides can observe visitors' park usage behaviors. Not only will they learn from their observations, but the process will make them feel more involved and more likely to utilize the data to make decisions about their work. Generally, however, YOU will wish to use neutral, outside observers who are not biased and can be selected for specific qualities that will make them good researchers-interest, patience, neutrality, attention to detail, reliability, and resourcefulness.<sup>8</sup> Both men and women researchers should be used.
  
- ◆ **Training researchers:** Researchers must be thoroughly trained in the use of the observation instrument. They must become comfortable with the format through repeated practice and, most importantly, they must be able to recognize and record behaviors in the same way.<sup>9</sup> During training, the researchers need to review each item on the instrument and agree on exactly what behavior constitutes each item. They then observe several role plays and compare their results as a group (agreements and disagreements) item by item.<sup>10</sup> Finally, they need to practice in the field until they are totally comfortable with the instrument.
  
- ◆ **Supervising and monitoring researchers:** During training and field work, observers must be supervised to assure that the data they are collecting are reliable and accurate. During the field work, the supervisor should spot-check inter-observer reliability by asking two researchers to observe the same activity and comparing the scoring on their instruments. Their data are considered reliable if they agree on 80% or more of the items. Reliability checks should be carried out on 25-30% of the total number of observations.<sup>11</sup>
  
- ◆ **Graphing results:** Results from observational research can be easily graphed in order to provide a simple picture of what is happening to the behavior over time.<sup>12</sup> Graphing initial observational data creates a baseline for a program and can then be compared to data collected once an intervention is underway. The case study in the following section provides examples of graphs illustrating the results of observational research.

For further information on conducting structured observation is available in Judith A. Graeff, et al., *Communication for Health and Behavior Change, A Developing Country Perspective*, (San Francisco, 1993).

## HINTS FOR CONDUCTING INDIVIDUAL IN-DEPTH INTERVIEWS

- ◆ **Designing the interview guide:** All of the interviewers should follow a common interview guide to standardize the information they are gathering. As with the observation checklist, the interview guide should be field tested with representatives of the target audience. Interview guide for topics of *doers and non-doers* could include:

- **Behavior:** What do men or women currently do and why?
- **Consequences:** What benefits have they had or perceived in doing the action?
- **Barriers:** What problems have they had doing this action? What have they done to overcome these problems?
- **Social norms:** Who do they care about and trust on this topic? What does that person/group think about what they are doing?
- **Knowledge and skills:** How did people hear about this action? How did they learn to do it?

In interviews with *non-doers*, the interviewer would also describe the proposed ideal behaviors and discuss them with the respondent. Interview guide topics might include:

- **Behavior:** Why don't they do this behavior now?
- **Consequences:** Would they try the proposed behavior? Why or why not? What do they think they would get as a result of doing this new behavior that *they* value?
- **Barriers:** What barriers to they perceive to doing the proposed new behaviors? What do they worry about, think they'll have to give up, suffer through, put up with, or overcome in order to get the benefit they decided they want from this new action?
- **Social norms:** Who do they care about and trust on this topic and what do they think that person/group would think if they tried the new proposed behavior?

- **Perceived skills:** Do they think they can carry out this new action without embarrassing themselves or failing?

- ◆ **Steps of an in-depth interview:** The following describes the process the interviewer would take during an in-depth interview:

**Introduction:** The interviewer greets the respondent in a culturally appropriate way, introduces him or herself, and asks the person's name.

**Motivation:** The interviewer motivates the respondent to talk with him or her about the topic. S/he explains the purpose of the visit and the importance of any opinions or information that the respondent might provide. The interviewer explains that the information is confidential and will not be used for any other purposes. S/he asks if the respondent has time to talk right now. If not, the interviewer makes an appointment for a more convenient time.

**Conduct the interview:** The interviewer conducts the interview in an atmosphere of trust. S/he uses the respondent's name frequently (if appropriate in the culture) and treats him or her with respect and genuine friendship. The interviewer should not disagree with or discuss the respondent's views, but rather accept them. The interviewer is there to *learn from the respondent*.

**Close the interview:** The interviewer thanks the respondent for his/her collaboration and help. S/he repeats how important the respondent's opinion is and how much s/he has learned. If possible, the interviewer gives the respondent practical examples of how the information being gathered will be used.

- ◆ **Asking questions:** There are three ways to ask questions: open-ended, closed-ended, and leading.

- *Closed-ended questions* are generally answered with a yes/no or other one-word answer. Below are examples of closed questions:

What crops do you cultivate on your farm?

How many times did you visit the park this year?

What day of the week do they collect paper in your neighborhood?

- *Open-ended questions* allow people to talk more about what they think, do, and feel. They typically begin with the words why, how, and what, or phrases like "Tell me about. . ." "Explain to me. . ." "Describe. . ." Open-ended questions have no right or wrong answers. They invite people to describe their own life experiences.

The following are examples of open questions:

What do you do to treat fungi on your crops?

Why do you visit the park?

What problems have you had in recycling your garbage?"

- *Leading questions* do just what they sound like they do. They "lead" people to give answers that they think the interviewer wants them to give. Leading questions begin with phrases like "Don't you think that ... ?" "Don't you agree that ... ?" "Isn't it right that. . .?" "I think ... What do you think?" Below are examples of leading questions.

Don't you think that farmers should plant crops on a contour?

Don't you agree that we should protect our natural resources?

Isn't it right that people in this community use too much firewood?"

Interviewers will need to use both closed-ended and open-ended questions during the in-depth interview. However, they should try to use more open-ended than closed-ended questions in order to understand more completely why people think, believe, or act as they do. They should not use any leading questions at all. Leading questions encourage respondents to say that they agree with the interviewer even if they don't. Generally, men interviewers should interview men and women interviewers should interview women.

- ◆ **Probing techniques:** Once the interview is underway, interviewers will find they need to explore further or probe what the respondent is saying. Respondents will not tell the interviewer everything at once. This is particularly true if this is the first time a respondent has been asked about what s/he does and how s/he thinks and feels concerning a specific topic.

The following are a few common probing techniques interviewers can use to explore a respondent's answers.

**Remain silent** for a few moments. In some cultures, people do not speak quickly or readily. The respondent may be wondering why the interviewer wants to know this information. S/he may be considering the different things s/he could say. Remaining silent gives the respondent time to think about what s/he wants to say.

**Repeat the respondent's words as a question.** For example, if a farmer says, "I tried planting fruit trees, but they all died," the interviewer could say, "All of the fruit trees died?" as a way of asking the farmer to explain more about it.

**Ask the respondent to place him/herself in the position of somebody else.** For example, ask "suppose a farmer had fungi on his plants-what would you recommend doing about it?" Or, "suppose the collector didn't pick up your neighbor's garbage. What do you think he or she would do with it?" This technique is useful if the topic is sensitive and the interviewer observes that the respondent is uncomfortable talking about his/her own experience.

**Ask the person to explain further.** Ask questions such as "What do you mean by that?" "Tell me more about that." "I'm not sure I understand what you mean." "You started to say something about... tell me more about it" "You mentioned something about. . ." to help the respondent explain more completely.

- ◆ **Selecting, training, and supervising researchers:** These are similar to the hints provided for conducting structured observation. However, training and supervision of the qualitative research techniques will also focus on how well the interviewers are performing the steps of the in-depth interview, following the interview guide, and using open questions and probing techniques. In putting together field teams for the research, care should be given to include people who have access to, and rapport with, target groups. In most societies women are best interviewed separately from men. This gives them a chance to speak more freely. Generally it is [b]est to have male researchers interview or conduct focus groups with men, and female researchers interview or conduct focus groups with women.

More information about how to conduct in-depth interviews is available in Susan Scrimshaw, *Rapid Assessment Procedures for Nutrition and Primary Health Care: Anthropological Approaches to Improving Programme Effectiveness*, (Tokyo and Los Angeles, 1987).

## HINTS FOR CONDUCTING FOCUS GROUPS

- ◆ **Similarities with in-depth individual interviews:** The hints for in-depth interviews can be applied to focus groups as well.
- ◆ **Differences between the focus groups and in-depth individual interviews:** The principal difference between these techniques is that the focus group is *an interchange among the participants of the group*. The responsibility of the facilitator or moderator (notice, not the interviewer) is to help this exchange happen. Ideally, only men should be facilitators for groups of males; females for groups of women.
- ◆ **Numbers of participants in each focus group:** Five to twelve people can participate in a focus group. The optimal number is 'considered to be five to seven people.
- ◆ **Selecting participants in the focus group:** It is important that the group be homogenous. The team will want to consider the variables of social class, age/marital status, cultural differences, geographic differences, and gender in selecting participants for each group. Focus groups with men and women and doers and non-doers should,, ". be conducted separately.
- ◆ **Determining the number of groups needed:** Conduct at least two focus groups for each variable considered In selecting the participants. For example, at a minimum, you would want to conduct eight focus groups-two with female doers, two with female non-doers, two with male doers, and two with male non-doers. If the results of the two focus groups you conduct within each category (female doers, for example) are very different, conduct additional focus groups with people from this category until it is clear what is causing these differences.
- ◆ **Determining the group setting:** The focus group setting should provide privacy for the participants. Select a location where people can talk without being observed by others who are not in the group. Select a neutral, non-threatening setting where people will feel comfortable speaking opening about the issue. Finally, select a location that is easily accessible by the participants.
- ◆ **Determining the group seating arrangement:** Participants should be seated in a circle or semi-circle. If they are seated at a table, the moderator should be aware that people sitting closest to him/her or at the head of the table may project higher status. The moderator will need to ensure that they don't lead or disrupt the group.

- ◆ **Involving everyone in the group:** In every focus group discussion, there will be some people who will want to talk a great deal, and some who will be timid. The moderator's job is to ensure that all participants have an opportunity to discuss their experiences and to contribute to the discussion. Certain "personalities" require different approaches.

- *The dominant participant*

Avoid eye contact, or turn your body slightly away from the person.

Call on someone else by name and ask for his or her opinion.

Ask for opinions specifically from "participants seated on this side of the table or circle(i.e., the opposite side from where the dominant participant is sitting).

If necessary, politely thank the participant for his/her opinion and say that you'd like to have the ideas of other participants as well.

- *The timid participant*

Use eye contact to pull the **timid participant** into the discussion. Look directly at him/her when you ask the question.

Observe the timid participant closely to see when s/he is ready to speak.

Ask an easy, non -threatening question which encourages a direct response. If the participant becomes too ill at ease. continue the discussion with other participants and come back to him/her later.

- *The "leader" participant*

Be aware if one of the participants of the group is considered to be an "informal leader." The other participants will frequently defer to this person and wait for him/her to make the decisions.

Use the techniques for the timid participant mentioned above to involve other members. However, it will be important not to insult the informal leader.

Many of these hints were adapted front Mary Debus, *Handbook for Excellence in Focus Group Research*. (Washington, DC, 1989).

## Select and Negotiate Target Behaviors

The selection of target behaviors is one of the most difficult and important decisions the Multi-Part team will have to make. Traditionally, environmentalists, in an effort to provide comprehensive information on a particular environmental problem, have included too many behaviors and messages in their programs. The result is very little impact on behavior change.<sup>13</sup> A common element of communication programs in other fields (such as family planning, public health, and agriculture) which have achieved demonstrated behavior change is their focus on a limited number of feasible target behaviors. As difficult as it is, in order to change people's behaviors related to improving environmental conditions, the MultiPart team must eliminate the majority of the ideal behaviors and select a *core of feasible target behaviors* as the focus of their environmental program.<sup>14</sup>

Selecting target behaviors is a process of elimination. The Multi-Part team excludes behaviors that have no demonstrated impact on the specific environmental problem or that are not feasible for the target audience to adopt. The final list of target behaviors of the program will be a highly selective subset of the ideal behaviors.<sup>15</sup>

Selecting target behaviors is also a process of negotiation between Multi-Part team members and the target audiences. In some cases, the ideal behavior simply is not feasible for people to do, yet it is critical to achieving an impact on the environmental problem. In this case, the team negotiates a new "intermediate" behavior, one which is feasible for people to do and will still have some impact on the problem.

The selection process should be conducted in a meeting or workshop with the same MultiPart team members involved in defining the ideal behaviors. The team will also want to invite community leaders, technical specialists, representatives of community groups, and other individuals identified during the research with doers and non-doers. Participation of representatives of the target audience is critical during the negotiation between the ideal and the feasible behaviors. Once again, the communicator's role is to facilitate this process, ensuring that all team members have an opportunity to express their opinions, and to assist the team in reaching a consensus.

### The Behavior Analysis Scale

The Behavior Analysis Scale is a tool to help select and prioritize target behaviors. The Multi-Part team rates the ideal behaviors using six criteria:

- ◆ potential for *impact* on the environmental problem,
- ◆ existence of *approximations* to the ideal behavior,
- ◆ *positive consequences*,
- ◆ *compatibility* with cultural norms or current practices,
- ◆ costs, and
- ◆ complexity.

The resulting "score" helps the team understand which behaviors have the most potential for impact on the specific environmental problem and which are feasible. The Behavior Analysis Scale is not a rigorous scientific methodology. Indeed the Multi-Part team may find that even with research results, they still have to score items without data or with available information that is contradictory. The ratings frequently are a compromise among the various disciplines and perspectives represented on the team.<sup>16</sup> Nevertheless, the scale facilitates a participatory, detailed analysis of the environmental issue and the ideal behaviors, which permits all of the principal concerns from the variety of disciplines and perspectives to be discussed systematically.<sup>17</sup>

The six criteria of behavior against which the ideal behaviors are rated include the following:

- ◆ **Potential for impact:** Is the ideal behavior really critical to obtain an impact on this **specific environmental problem**? If people carry out this behavior, will it have a measurable positive or beneficial impact on the specific problem? The Multi-Part team may also need to discuss if the behavior might have a negative impact on another technical area. For example, in El Salvador the team identified as a positive behavior the heating of a family's food only once a day, in order to reduce the amount of firewood consumed and reduce deforestation. However, reheating children's weaning food immediately before consumption is necessary to reduce the contamination which causes infant diarrhea. Although the identified environmental behavior would have a high positive impact on deforestation, it could have a devastating effect on infant health.
- ◆ **Feasibility:** Is the ideal behavior really feasible for the audience to perform? Are there any existing behaviors that are **approximations** to the ideal behavior?
  - Approximations are actions that people are currently performing that are similar to the ideal behavior, but are not performed correctly or at the right time, duration, or frequency. An effective education and communication strategy builds on these approximations by reinforcing those aspects of the behavior that people are doing well and correcting what they need to change.<sup>18</sup> For example, park visitors may be putting their trash in containers at camp sites, but littering when they walk along the park trails. In this case, putting trash in containers at camp sites is an approximation to the ideal behavior of not littering anywhere

in the park.

- Does the ideal behavior have any immediate **positive consequences** which are observable to or perceived by the person performing it? For example, families who participate in reforestation may perceive the positive consequence of a more picturesque landscape. Families who conserve water may perceive the immediate consequence of a lower water bill. Women who participate in recycling programs may perceive the negative consequences of getting their hands dirty while sorting the trash. At the same time they may receive a positive consequence from their husbands and children who think that recycling is important.
- Does the ideal behavior have inadvertent **negative** impact on men or women of non-target groups? Will non-target group members lose income or social prestige as a consequence of the new behavior?
- Is the ideal behavior **compatible** with socio-cultural norms or current acceptable practices? For example, in many cultures consumption of electricity and water is an acceptable social norm, especially in the middle and upper classes. People feel that they have worked hard to obtain their income and deserve to consume all of these resources they can afford. In this case, conserving electricity and water is incompatible with sociocultural norms.
- Does the ideal behavior have a reasonable **cost** in terms of time, energy, money, or materials? For example, recycling has a high cost in terms of the time and energy necessary to sort, store, and bag the different types of trash in comparison to normal garbage collection.
- How **complex** is the ideal behavior? Is it easily divided into a small number of elements or steps? How much training would it require for people to do it correctly? For example, many of the behaviors required for sustainable agriculture such as contour farming, live fences, composting, and crop rotation to name just a few, are much more complex than those performed for simpler slash-and-burn agriculture.

**A behavior has more potential for being adopted if—**

- it is similar and compatible to what people are already doing,
- it is simple,
- it is low cost,
- it provides immediate, positive consequences, for both men and women.

The Multi-Part team rates each ideal behavior for each criterion using the following scale. The resulting "score" helps the team to see which of the many ideal behaviors have the most potential for impact on the environmental problem and which are feasible for people to do.

## THE BEHAVIOR ANALYSIS SCALE

### POTENTIAL IMPACT ON THE PROBLEM

- 3 Has a great deal of impact on the problem.
- 2 Has some impact on the problem.
- 1 Does not have any impact on the problem.

### FEASIBILITY

#### Consequences

- 3 Has immediate, positive consequences which are observable to or perceived by the person who is carrying out the behavior.
- 2 Has some immediate, positive consequences which are observed or perceived by the person who is carrying out the behavior.
- 1 Does not have any immediate, positive consequence.

#### Approximations

- 3 It is very similar to what men/women are currently doing (actual behavior).
- 2 It is somewhat similar to what men/women are currently doing.
- 1 It is totally different from what men/women are currently doing.

#### Complexity

- 3 It is very simple to do and does not require a lot of steps or training.
- 2 It is somewhat simple to do. Requires some steps and would require some training.
- 1 Requires a lot of steps to do and would require a great deal of training.

#### Cost

- 3 Has a very low cost in terms of time, energy, money, or materials.
- 2 Has some cost in terms of time, energy, money, or materials.
- 1 Has a very high cost in terms of time, energy, money, or materials.

The following describes how to apply the Behavior Analysis Scale to select target behaviors during the workshop

- ◆ **Present and discuss the audience research findings** so that all team members share an understanding of people's perceptions, knowledge and behaviors and the "consequences" that support behaviors.
  
- ◆ **Review the list of ideal behaviors** and add behaviors that the research has identified as appropriate and necessary for the correct performance and maintenance of the environmental practice."
  
- ◆ **Apply the Behavior Analysis Scale**
  - Evaluate each ideal behavior in terms of its *potential impact* on the environmental problem. To do this, ask the team members to determine a score of one to three (as described in the Behavior Analysis Scale). Technical specialists usually take the lead role in these discussions because they have the most scientific information about what impact each behavior could have on the environmental problem. If an ideal behavior *does not have any major potential* for impact or has limited potential, eliminate it from the list of behaviors.
  
  - Evaluate each ideal behavior in terms of its *feasibility*. To do this, ask the team members to determine a score from one to three (as described in the Behavior Analysis Scale) for each of the "feasibility" criteria based on what they have learned from the audience research about what doers and non doers know, believe, and do. If any of the behaviors scores a number of "ones," this is probably not feasible for the target audience to carry out in its ideal form and should be eliminated from the list or modified after negotiations between the Multi-Part team members and other representatives of the target audience.
  
  - Analyze each behavior for women separately from men. Disaggregated scores may produce different results.
  
- ◆ **Negotiate unfeasible behaviors:** In some cases, a behavior is absolutely necessary to achieve an impact on the specific environmental problem, but is not feasible for the target audience to perform .21 In such cases, the Multi-Part team will need to negotiate an intermediate behavior which is feasible for people to do yet could still have significant impact on the environmental problem. To negotiate a feasible behavior, the communicator facilitates a discussion between the technical specialists and representatives of the target audience. The

representatives of the target audience help to define what behaviors would be feasible to perform, while the technical specialists determine whether the proposed behaviors could still have significant impact on the environmental problem. Frequently, the research findings suggest alternatives feasible behaviors which can be discussed and refined by the Multi-Part team.

For example, in a recent urban trash collection program in Ecuador, the audience research indicated that requiring people to place their garbage in plastic bags for collection was not feasible for lower-income families. Using plastic bags had a very high financial cost and was incompatible with what these families were currently doing (using buckets, sisal bags, and boxes). The negotiated behaviors included alternatives that were feasible for lower-income target audiences—wrapping trash in paper and using old boxes or sisal bags.

- ◆ **Prioritize target behaviors:** If the resulting list of target behaviors is still too long to be manageable, the Multi-Part team will need to prioritize them and determine which should receive initial focus and which could be introduced later in the program." There are several ways to prioritize behaviors.
  - **Start with what people are already doing correctly:** Review the scores of the Behavior Analysis Scale and select the behaviors that scored high in "approximations." Education and communication strategies are most successful when they build on, reinforce, and reward people for what they are already doing correctly. Early research on environmental behavior change indicates that compliance with an initial small request will increase the probability of compliance with a subsequent request that requires more effort. Success breeds success.
  - **Sequence:** Review the list of ideal behaviors and put them in the sequential order that would make them easiest to carry out. Begin the education and communication strategy with the first behaviors on the list.
  - **Impact on the environmental problem:** Some of the behaviors may be more important in terms of their impact on the specific environmental problem. The team may wish to focus on these critical behaviors first.
  - **Political climate:** Given a particular political climate, the team may want to focus on behaviors that are important politically or that respond to issues being discussed in the media.

The case study in the following section provides an example of how the Behavior Analysis Scale was applied to an environmental program in Ecuador.

## HINTS FOR SELECTING TARGET BEHAVIORS

- ◆ Selecting target behaviors is most easily done in a one- to two-day workshop to which all of the Multi-Part team members who were involved in defining the ideal behaviors are invited. You will also want to invite other people you have identified through the audience research (technical specialists, community groups, and other representatives of the target audience). The more participation, the better.
- ◆ There will be a lot of discussion about the first behaviors the team analyzes while they are learning what each criterion on the Behavior Analysis Scale means. Usually there is less discussion once the team members become familiar with the criteria.
- ◆ Refer constantly to the research findings. Team members will begin speaking about their individual experiences concerning the ideal behaviors or what they have observed other people doing. Although their experiences are important, the team needs to use the *research findings* from the target audience as a basis for their decisions.
- ◆ If team members disagree about the rating of a certain criterion, facilitate the discussion to understand the reasons. Assist the team members to come to a consensus.
- ◆ Keep on track. It takes about three hours to analyze 20 ideal behaviors. Discussion is very important, but participants will need to keep focused on the task.

## Develop Strategies

The next step in the process is to develop training and communication strategies aimed at influencing targeted behaviors. The results of the research with the target audience can assist the Multi-Part team to:

- ◆ Identify the factors which influence doers' and non-doers' behaviors; and
- ◆ Design education and communication strategies that are more effective because they address and build on those factors.

Specifically, the team identifies what factors most strongly influence doers to perform the ideal behaviors, and what factors influence non-doers not to perform them. Then the team develops strategies that:

- ◆ Build on and strengthen those factors that have most influenced the doers, and
- ◆ Reduce or weaken those factors which have created barriers for non-doers.

To do this, the Multi-Part team will need to determine whether the absence or incorrect performance of the target behavior is due to a **skills deficit** or a **performance deficit**.<sup>22</sup> If there is a **skills deficit**, the target audience lacks the specific information, skills, or reminders (antecedents) they need to perform the target behaviors. In this case, the education and communication strategy would focus on providing information, creating demand for products and services, and teaching people the skills they need to carry out the behaviors correctly. If there is a **performance deficit**, the target audience has the necessary knowledge and skills, but they are still not performing the behavior correctly or at all. In this case, the education and communication strategy would focus less on informing people and teaching skills, and more on developing an environment of support for continued performance of the target behavior. The following describes some of the strategies which might be developed in skills and performance deficits.

- ◆ **Skills deficit:** If there is a skills deficit, the audience lacks specific information, skills, or reminders to perform the behavior correctly.
  - **Knowledge:** If lack of knowledge is an important factor, the strategy would be to provide information through a public information campaign. For example, in an environmental program to conserve water, non-doers might not know exactly what actions they can take to save water. The strategy would include a public information campaign aimed at urban

families to inform them about what they can do to reduce their consumption. For example, they could water their gardens using a bucket rather than a hose, fix leaky faucets, and not water their lawns. Since both men and women consume water, it is important to develop specific strategies for each, targeting the different ways they use and perceive this resource. Thus cutting back on water use while washing cars might be a male social role, while reducing laundry water consumption might be a female role. (Previous research suggests that if men are not reminded that they have domestic water relevance they tend to think of reduced domestic water consumption as a female responsibility.)

Fisherfolk may not know the exact dates of a specific fishing season, the amounts of fish they are allowed to catch, or the boundaries of fishing areas under local municipal regulations. The strategy would be a public information campaign aimed at fisherfolk to provide this information.

- **Skills:** In some cases, people might know they should carry out the target behaviors, but might not have the skills (abilities) they need to perform them. The strategy would then focus on providing training to teach people how to carry out the target behaviors correctly. For example, farmers might know that pesticides can be dangerous if improperly utilized, but not have the skills they need to use them correctly. The strategy would focus on skills-based training that would teach farmers (men and women) how to use pesticides and other agrochemicals correctly.

If the target audience is already performing approximations to the target behaviors, the communication strategy would reward those approximations and teach the skills necessary to shape them into the target behaviors. For example, farmers may already be doing some of the behaviors necessary for correct pesticide use. The training strategy would be to reinforce the farmers for those correct behaviors, while teaching those behaviors they are not carrying out.

- **Reminders:** Many behaviors are automatically triggered by naturally occurring events (or antecedents). For example, the beginning of rainy season is a naturally occurring antecedent for farmers 'in most tropical countries to begin planting their crops. On the other hand, many important environmental behaviors have no naturally occurring antecedents to trigger them. The team might find that the target audience has tried the target behaviors and know they should carry them out, but they forget to do so regularly because these have not yet become a "habit" or "second nature." The strategy would include the introduction of reminders to help people remember when and how to carry out the target behaviors.

For example, families beginning to participate in a recycling program might not remember the specific days of the week they should put the different types of garbage (glass, metal, paper, and organic) out for collection. Part of the communication strategy could include a colorful sticker that illustrates the type of garbage to be put out each day and that could be posted on the wall close to where the garbage is stored.

- ◆ **Performance deficits:** In many cases, the absence or incorrect performance of target behaviors is due to a **performance deficit**. The target audience has the necessary knowledge and skills, but they are still not performing the behaviors correctly or at all. In this case, the education and communication strategy would focus more on reducing barriers and increasing positive consequences for the target behaviors. The results of the audience research and Behavioral Analysis Scale assist the team in identifying which factors are the best "targets of opportunity" for the education and communication strategy; that is, which factors are the most important and present the most potential for helping people change their behavior. The following describes some of the strategies that could be developed for a performance deficit, depending on the factors identified:

- **Develop and/or strengthen appropriate technologies (services, products, and practices):** The lack of appropriate technologies can be a critical barrier to behavior change. The audience research may indicate that people are not carrying out the ideal behaviors because appropriate technologies are unavailable, inaccessible, too complex, or do not provide economic incentives or other positive consequences. Effective strategies might include developing technologies which are appropriate and relevant to the target audience, increasing their accessibility, and reinforcing people's perceptions of the positive consequences they will obtain from their use.

For example, farmers may be willing to change some of their traditional slash- and-burn agricultural practices if alternative practices provide an income equal to or better than what they are currently earning. In this case, the communication strategy would focus on introducing, reinforcing, and maintaining these alternative practices. For example, rural women may be willing to stop cutting fuelwood in national reserves if wood lots are developed. Fisherfolk may be willing to stop using cyanide to fish if less damaging technologies, such as barrier nets and hook and line fishing, provide them with a comparable income.

The audience research can also identify how doers have adapted existing technologies and overcome barriers which have limited non-doers' use. These solutions can then be promoted as a part of the communication

strategy. For example, women who participate in recycling programs may have found a way to store their organic trash so that it does not cause an odor in their homes, a principal barrier perceived by women who do not recycle.

- **Change or strengthen policies and laws:** The non-existence of policies and laws or their lack of enforcement can also be a critical barrier to sustained behavior change. The audience research may identify that national policy or laws do not support or actually create a barrier to people's adoption of the target behaviors. It can also assist in identifying what type of policy change would be necessary to support and maintain these behaviors. The communication strategy could include a media advocacy strategy or public awareness campaign to influence the media, politicians, and other opinion leaders on the specific policy or legislative changes necessary to support people's behavior change.

For example, people who live in the buffer zone of a national park might be willing to conserve the forest reserve, but national policy might permit logging. In this case, a communication strategy could focus on changing the policy or law which allows logging within the reserve. Similarly, fisherfolk might be willing to establish a sanctuary and regulate overfishing in their own areas if national policy permits municipalities to establish regulations regarding their own coastal resources.

- **Increase positive consequences:** The audience research might identify a positive consequence or benefit to doing the target behaviors which doers know about, but non-doers do not mention. The communication strategy can promote this benefit as a way of motivating the non-doers to try the target behaviors. For example, fisherfolk who comply with fishing regulations might perceive that they have better fishing every year if they do not over fish in any one year. Radio and television spots could feature testimonials from these fisherfolk that emphasize this benefit, to convince non-doers to comply as well.
- **Reinforce "Important Others" (social norms):** The audience research might identify social norms that would support the target behaviors. The communication strategy would link the performance of the target behaviors to this positive social norm. Specifically, it would make the target audience more aware that "important others," or opinion leaders support this behavior and want them to do it. These important others could be involved as spokespersons for the program and used as sources of information in mass media materials. For example, a popular entertainer could be involved as the spokesperson for an urban anti-littering program. S/he could make

appearances at public events, mention the importance of keeping the city clean in his or her performances, and appear on radio and television spots that promote the target behaviors.

- **Perceived skills:** How skilled a person feels about managing the new behavior (self-efficacy) can influence his or her behavior and can be influenced to facilitate behavior change. For example, to recycle garbage consistently and with ease, individuals not only have to be able to do it, they have to think that they can. Audience research can identify whether people perceive they can perform the ideal behaviors. For example, farmers may not try a new agricultural practice because they don't believe they are capable of doing it. In this case, the communication strategy would focus on skills-based training. Farmers would have several opportunities to practice the new skills. Trainers would provide feedback to these farmers, rewarding them for what they do well and helping them to improve their skills each time they practice. The strategy could also include support and reinforcement of these behaviors during farm visits by extensionists and other technicians.

The case study in the following section provides examples of how strategies were developed in response to the factors identified through the audience research.

## HINTS FOR DEVELOPING EFFECTIVE STRATEGIES BASED ON BEHAVIORAL RESEARCH

- ◆ **Compare doers and non-doers:** Compare the doers and non-doers in order to identify exactly what specific factors make them different from each other. Why are doers performing certain behaviors and non-doers not? What factors are influencing those differences? For example, why do some farmers adopt alternative agricultural practices and others do not?
- ◆ **Skills deficit or performance deficit:** Decide whether the absence of the target behavior is due to a skills deficit or performance deficit and define strategies accordingly. For example, do farmers refrain from alternative agricultural practices because they don't have the necessary knowledge or skills to perform them correctly (skills deficit), or because of other factors (performance deficit) such as the lack of title to their land (policy), inaccessibility of alternative technologies, or positive consequences for non-desirable behaviors?
- ◆ **Skills deficit:** If the absence of the target behaviors is due to a *skills deficit*, develop strategies which provide information or teach the skills necessary to perform the target behaviors correctly.
- ◆ **Performance deficit:** If the absence of the target behavior is due to a *performance deficit*, identify and develop strategies that reduce barriers and increase positive consequences for performing the behavior. Consider the need to promote policy changes or to identify technology alternatives. Build on "targets of opportunity," selecting factors which appear to be the *most different* between doers and non-doers.
- ◆ **Conduct quantitative research:** If the program is working with large populations, the Multi- Part team will need to conduct a quantitative survey with a more representative sample of the target audience in order to understand how generalizable the results of the small sample study are to the larger target audience. The results of the quantitative survey are used to fine- tune the recommendations concerning target audiences and strategies.

- ◆ **Conduct behavior trials:** In many cases, the Multi-Part team will also want to test strategies or target behaviors in behavioral trials, especially if the target behavior is a new" behavior that was negotiated with technical experts during the selection process. For example, an extensionist could teach several (5- 10) farmers a new organic method of pest control and ask them to try this new method for a week. The researcher would then visit the farmers and: 1) observe them applying the method, noting adaptations they have made in the process, 2) discuss with them the problems they have had and how they have resolved them, and 3) discuss what advantages and disadvantages (consequences) they have obtained in preparing and using this method of pest control.

# Summary

The first section of this guide has described a participatory process for selecting target behaviors and provided a conceptual framework for the methodology. The section described the steps of the process and how to put them into practice, providing examples of their application.

Specifically, it described how a multidisciplinary, multisectoral, multilevel, participatory team (Multi-Part team) works together to implement the four steps of the process:

- ◆ Define the ideal behaviors;
- ◆ Conduct research with doers and non-doers (men and women);
- ◆ Select and negotiate target behaviors; and
- ◆ Develop strategies that address and build on the specific factors affecting the adoption of the target behaviors.

The Multi-Part team is the key to the success of this process. Working together as a team generates participation from all of the stakeholders. It develops consensus among the diverse groups needed to introduce, support, perform, and maintain target behaviors. Moreover, it creates a new kind of partnership among the various disciplines, sectors, and levels of people who will be involved in and affected by the project.

The following case study describes how this participatory process was applied to an environmental program in Ecuador.

# References

All the references (1-22) in this section of the manual are selections from:

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

## **Section II**

### **A Case Study**

**Applying the Participatory Process  
to an Environmental Project  
in Ecuador**

## Background

Ecuador ranks among the world's richest countries in biological diversity per unit area. Its territory includes 25 Holdridge life zones and supports 1,550 bird species and more than 20,000 vascular plant species. The Ecuadoran government has set aside approximately 3.5 million hectares, 13 percent of its territory, to parks and reserves. However, public policy, colonization of protected area buffer zones, expansion of agricultural and coastal farming, mining explorations, and the lack of economic alternatives put pressure on these protected areas and their buffer zones and impede the conservation and sustainable use of their natural resources.

## The SUBIR Project

The Sustainable Uses for Biological Resources (SUBIR) Project is a USAID-funded initiative, begun in 1991 to identify, test, and develop economically, ecologically, and socially sustainable resource use models in Ecuadoran parks and reserves and adjoining buffer zones. It was conceived as an Integrated Conservation and Development Project (ICDP) which regards the people living within and near parks or reserves to be as important as the biodiversity it proposes to conserve.

Phase I of the SUBIR Project was initiated in 1991 with a management consortium comprised of CARE, Wildlife Conservation Society, and The Nature Conservancy. Now in Phase II of the Project, SUBIR-CARE is focusing activities on the buffer zone areas of Cotacachi-Cayapas Ecological Reserve in northwest Ecuador. This Reserve covers 204,420 hectares and is located in the transitional zone between the provinces of Imbabura, and Esmeraldas. It ranges in altitude from 100 to almost 5,000 meters above sea level, representing a gradation of ecosystems from the rivers and humid tropical forests of the coast, to the Cotacachi volcano and its high mountain lakes. The Project is working in two areas, one on each side of the Reserve-Borbon in the northwestern lowland area and Cuellaje in the southeastern highlands.

Phase II of SUBIR-CARE has five components:

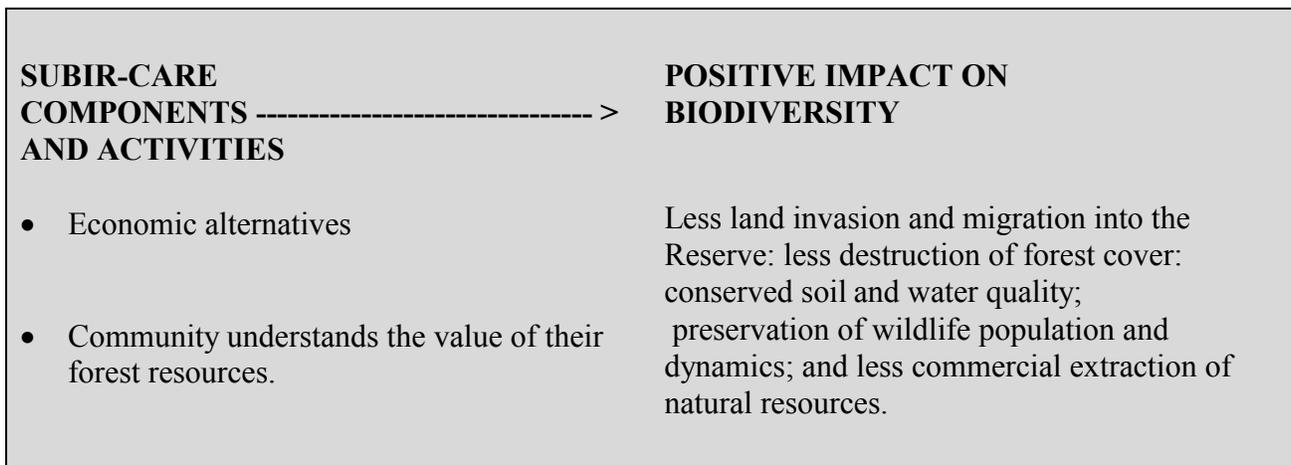
- ◆ Institutional Development and Organizational Strengthening,
- ◆ Policy and Legal Issues,
- ◆ Commercialization and Marketing,
- ◆ Sustainable Land Use Management, and
- ◆ Biodiversity Investigation.

The basic assumption of the SUBIR-CARE Project, as outlined in the USAID SUBIR Project Paper Amendment No. 1, is that incursion into protected areas (and resultant threat

to the habitats which ensure biodiversity) occurs in response to perceived economic necessity. If the Project target population is provided with economic alternatives and an understanding of longer term implications of proper management of natural resources, then the misuse of protected areas and the concomitant threat to biodiversity will be reduced. A major thrust of the Project, therefore, is the creation of economic opportunities for families who live in the Reserve buffer zones. The assumption is that, if successful, such opportunities will relieve pressure on the Reserve habitats and upon its biodiversity.

A corollary to the first assumption is that if the Project target population understands the longer term value and advantages to themselves of sustaining the Reserve and related buffer zone, they will be an active force in preventing incursions or abuse by others (e.g., colonists, loggers or oil companies.) Phase II of the SUBIR-CARE Project is concentrating, therefore, on developing institutional capacity of private voluntary organizations (PVOs), secondary level organizations (SLOs), and community organizations to identify, develop, and implement land use, marketing, and legal strategies that demonstrate how economically viable rural development can proceed in a manner that conserves biodiversity and reduces or prevents habitat degradation.

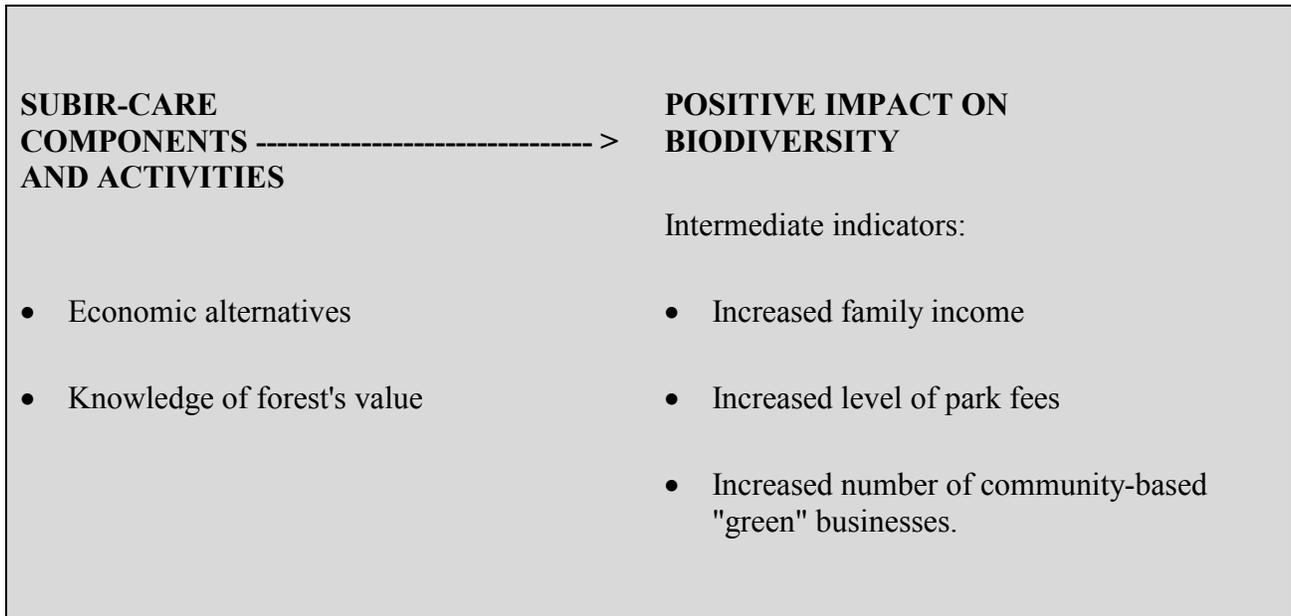
This model can be visualized as follows:



The SUBIR-CARE Project includes a Biodiversity Investigations Component to evaluate overall project impact. These investigations employ trained professionals, a cadre of local parabiologists (community members trained in biological data collection), and incorporate databases generated in Phase I (satellite images coupled with GIS and GPS technology) to measure changes in biodiversity in the Reserve.

Knowledge does not necessarily lead to behavior change. Community members' knowledge of the value of their forest resources may not lead to behavior change if the economic alternatives are not in place. At the same time, other factors outside of the mandate or control of the project (such as climate, war, political and socio-economic factors) could have

an impact, both positive and negative, on the biodiversity of the Reserve. In response to this concern, USAID and SUBIR-CARE identified intermediate indicators that could be used to measure Project impact. This model can be visualized as follows:

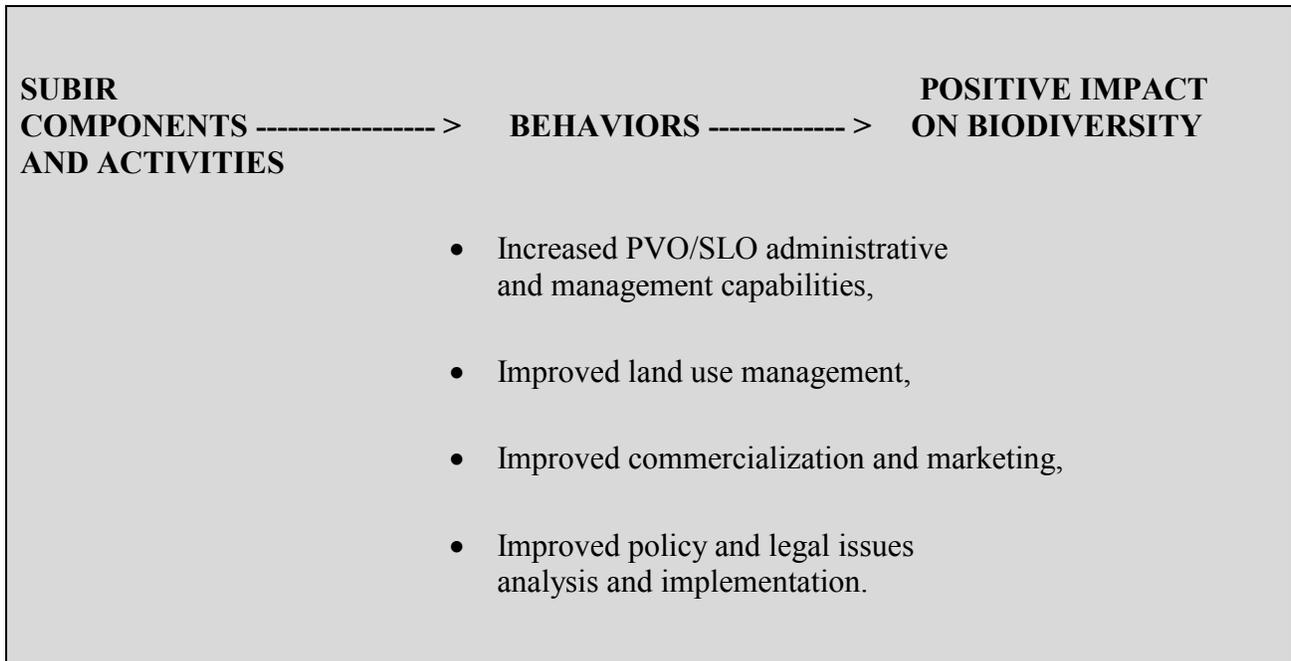


Factors outside the control of the Project could influence these intermediate indicators as well. More importantly, even if these intermediate indicators are achieved, they may or may not have a positive impact on biodiversity. For example, exploiting the resources within the Reserve might increase family income and have a negative impact on biodiversity. Furthermore, experience in assessing family income during Phase I demonstrated that this indicator was difficult to measure. Families were reluctant to tell researchers how much money they made from different sources and a large amount of economic activity consisted of trade and barter.

Increased park fee receipts and numbers of community-based "green" businesses were more easily evaluated. However, both USAID and SUBIR-CARE felt that these measures fell into the realm of "bean-counting," similar to other Project monitoring measures such as numbers of meetings conducted, numbers of seeds and plants distributed, and numbers of farmers working with the Project. USAID and SUBIR-CARE felt that these numbers did not demonstrate the long-term impact of the various components of the Project.

As discussed in Section 1, the field of behavioral analysis suggests an alternative model for measuring impact. The basic assumption of this model is that specific behaviors of those affected by and involved in Project activities can be used as intermediate indicators. The behaviors selected should be those which have the most *potential for positive impact* on the

specific environmental problem, in this case the conservation of biodiversity in the Reserve and its outlying buffer zone. However, they should also be behaviors which are *feasible* for the various target audiences affected by the Project (policy makers, non-governmental organization personnel, and community members) to perform. In the Phase 11 design, USAID and SUBIR-CARE identified broad environmental practices as the goals of the Project. This model can be visualized as follows:



These general environmental practices would be extremely difficult to measure. The question remained how to define the term "improved." What specific behaviors could be identified which would meet the criterion of "improved" for each practice? USAID and SUBIR-CARE asked GreenCOM to assist Project staff and their local partners in defining those specific behaviors for the Sustainable Land Use Component 'in one Project site and 'in developing a practical, efficient, low-cost methodology for measuring them.

### **The Sustainable Land Use Component in Cuellaje, Ecuador**

One of the principal sites of the SUBIR-CARE Project is Cuellaje, a town of about 600 people located along the southeastern slopes of the Cotacachi-Cayapas Ecological Reserve in an area colonized by mestizos over 80 years ago. The climate is warm year-round and the soil has a history of being rich. Locals say "if you plant a rock, it grows." However, due to

population pressure, mono-cropping, and traditional slash-and-burn agricultural practices, the land is being over-exploited and local natural resources, especially the soil, rivers, and forests, are rapidly being depleted.

SUBIR-CARE works with Cuellaje's farmers association, ATAACU, to coordinate biodiversity research, organizational strengthening, sustainable land use, commercialization and marketing, and land titling with the ten dispersed communities in the Cuellaje bufferzone watershed. In order to enhance farmers' long-term economic situations, SUBIR-CARE (through PROMUSTA, another CARE-Ecuador project) trained local extensionists in agroforestry and intensive agricultural techniques as alternatives to clearing more forested land. In Phase 1, the Project worked with six of the ten communities; in Phase II, it will expand its work into the remaining four.

## **The Process**

The SUBIR-CARE Project staff and their local counterparts, with technical assistance from the GreenCOM Project, applied the process described in Section I of this document to identify target behaviors and design training and communication strategies that can influence adoption of those behaviors by the target audience. The first step in this process was to identify the "ideal behaviors" which, if performed by the target group, would have maximum impact on the environmental practices.

### **Identifying the Ideal Behaviors**

The ideal behaviors were identified through a series of workshops and meetings with a Multi-Part team made up of SUBIR-CARE Project staff, local counterparts, representatives of community groups, and local farmers. The first draft of ideal behaviors was developed for four of the five components (Institutional Development and Organizational Strengthening, Policy and Legal Issues, Commercialization and Marketing, and Sustainable Land Use Management) in a workshop held in Quito. The Multi-Part team in this workshop included 15 national, regional, and local Project staff with backgrounds as diverse as law, anthropology, architecture, biology, natural resource management, agricultural extension, and international policy.

The team first defined the overall goal of the Project:

*Conserve biodiversity of the protected area (Cotacachi-Cayapas Ecological Reserve) and its buffer zone through the creation of incentives and economic alternatives for local populations.*

They then defined the objectives and ideal behaviors for each Project component. The objective for the Sustainable Land Use Component was defined as:

*Limit agricultural expansion into the Reserve through intensive use of existing agricultural plots.*

The discussions were lively as the participants attempted to identify ideal behaviors for each component. The Sustainable Land Use Component generated the most amount of discussion. Ideal behaviors related to land use depend on a number of variables including altitude, soil type, the specific crops to be cultivated, and the size of the farm. Frequently the response of the natural resource specialists and agricultural extensionists to the question, "What do we want farmers to do to reach the objective?" was, "Well, it depends!" However, after extensive discussion, the team finally decided on the following eight categories of agricultural practices which were important to achieving the goal of "limiting agricultural expansion into the Reserve through intensive use of existing agricultural plots":

- ◆ integrated pest management,
- ◆ correct use of fertilizers,
- ◆ crop diversification,
- ◆ crop association,
- ◆ soil quality maintenance,
- ◆ multiple-use forestry management,
- ◆ soil conservation, and
- ◆ water resources conservation.

They also began to define the ideal behaviors for each of these categories. (See following box.)

**FIRST DRAFT  
IDEAL BEHAVIORS  
SUSTAINABLE LAND USE COMPONENT  
SUBIR-CARE PROJECT**

**A. INTEGRATED PEST MANAGEMENT**

1. Use natural pesticides.
2. Use only "approved" chemical pesticides and fungicides (those which are included in categories one and two), when it is absolutely "necessary" (to be defined), at "minimum intervals" (to be defined), and in the recommended quantities.

**B. USE OF FERTILIZERS**

1. Use organic fertilizers.
2. When "necessary" (to be defined), use the chemical fertilizers in the recommended form.

**C. CROP DIVERSIFICATION**

1. Cultivate at least (to be defined in each site) "new" species (not currently cultivated in the zone, but cultivated in similar zones in the country) in every plot.

**D. CROP ASSOCIATION**

1. Cultivate at least two species which are ecologically compatible (to be defined in each site) in every plot.

**E. SOIL QUALITY MAINTENANCE**

1. Rotate crops following the recommendations for local agricultural cycles (to be defined in each site).

## **F. MULTIPLE-USE FORESTRY MANAGEMENT**

1. Cultivate existing agricultural fallow land (chaparral) instead of opening up new forest areas.
2. Don't open up forest areas to cultivate grass or crops.
3. Utilize wood and non-wood forestry products in accordance with a "Sustainable Management Plan" (to be defined).

## **G. SOIL CONSERVATION**

1. Plant crops on the contour.
2. Cultivate crops in terraces.
3. Cultivate crops only on slopes of less than 20 degrees.
4. Burn crops only under "recommended" conditions (to be defined).

## **H. WATER AND WATER RESOURCES CONSERVATION**

1. Do not wash sisal (a traditional crop which must be washed before it is sold and pollutes water resources due to its high phosphate content) in rivers or streams.
2. Maintain (don't cut) vegetation for 50 meters along the banks of rivers and streams.

Use water resources in accordance with a "Sustainable Management Plan" (to be defined).

At this point, many of the ideal behaviors were still very general and allowed for a great deal of subjective interpretation. They needed to be refined and made more specific in each Project site.

This was accomplished during a workshop in Cuellaje. The Multi-Part team for this workshop included 30 people:

- ◆ **National level:** the CARE-SUBIR Monitoring and Evaluation Coordinator;
- ◆ **Regional level:** the CARE-SUBIR Regional Project Coordinator;
- ◆ **Local level:** ATAACU (the local farmers organization) leaders, paralegals (community members who are trained by the Project in land-titling and other basic legal issues important to community development), and parabiologists; community members (men and women) from three communities where the Project had been working the longest; the CARE-SUBIR Cuellaje Coordinator; and the Project extensionists (the Ministry of Agriculture has no representatives in Cuellaje).

Once again the discussion was very lively as the team members reviewed the practices and ideal behaviors identified in the Quito workshop. They were generally in agreement with the importance of the agricultural practices, but proposed more specific alternatives for the ideal behaviors. They also added the practice of guinea pig management because of the role these animals have in sustainable agriculture. Guinea pigs are an important source of protein in the family diet. The grasses produced in live fences can be used to feed them, and their manure is an important element in worm farming.

The ideal behaviors were finalized in a meeting with the Project extensionists. The final list of ideal behaviors is included in the following boxes.

**IDEAL BEHAVIORS  
SUSTAINABLE LAND USE COMPONENT  
CUELLAJE**

**A. PEST AND DISEASE CONTROL**

1. Use natural pesticides and fungicides. (A list of natural pesticides and fungicides was included in a separate annex.)
2. Use chemical pesticides and fungicides:
  - exclusively green label/first category (least toxic).
  - in recommended quantities, at recommended times, depending on the crop,
  - mixed with natural pesticides and fungicides.
3. Prepare the soil and let it lie fallow for at least 20 days before planting.
4. Rotate short-cycle crops following the local agricultural cycle.

**B. USE OF FERTILIZERS**

1. Use organic fertilizers (cow manure, compost, worm manure, among others).
2. Use chemical fertilizer only:
  - when a soil analysis shows that it is necessary,
  - in quantities recommended by the extensionist (minimum quantities),
  - mixed with organic fertilizers.

**C. DIVERSIFICATION AND ASSOCIATION OF ECOLOGICALLY COMPATIBLE CROPS**

1. Cultivate at least three ecologically compatible, income-generating, and family consumable crops in every agricultural plot. (Several examples of compatible and incompatible crops were listed.)

#### **D. SOIL QUALITY MAINTENANCE**

1. Incorporate organic material (weeds, sugarcane pulp, sisal pulp, bean husks, worm manure, and compost, among others) in soil preparation.
2. Incorporate organic material (weeds, sugarcane pulp, sisal Pulp, bean husks, worm manure, and compost, among others) into the soil during the growing season.
3. Grow beans on top of thickets. (A traditional practice in which chaparral is not burned before planting.)
4. Manage pasture only on slopes of less than 45 degrees.
5. Mini only what is to be immediately cultivated.
6. Cultivate all of the land that is burned.

#### **E. SOIL CONSERVATION**

1. Plant crops on the contour.
2. Plant fruit trees (citrus, avocado, etc.) or forestry species (alder) *within* the plot.
3. Plant fruit trees (citrus, avocado, etc.) or forestry species (alder) *around* the plot (wind breaks).
4. Establish live fences (grass or sugarcane) on the contour within the plot.

#### **F. MULTIPLE USE FORESTRY MANAGEMENT**

1. Cultivate existing agricultural fallow land (chaparral) instead of opening up new forest areas.
2. Don't cut down forest to cultivate pasture or crops.
3. Utilize wood and non-wood forestry products in accordance with a "Sustainable Management Plan" (to be defined).

## **G. WATER AND WATER RESOURCES CONSERVATION**

1. Do not wash sisal in rivers or streams.
2. Maintain (don't cut) vegetation
  - for 50 meters around springs,
  - for an average of ten meters along the banks of rivers and streams.
3. Use water resources in accordance with a "Sustainable Management Plan" (to be defined).

## **H. SMALL ANIMAL MANAGEMENT**

1. Raise guinea pigs:
  - Type One—purebred,
  - Type Two—hybrid purebred and native.
2. Raise guinea pigs in cages or pens.
3. Feed the guinea pigs salts and minerals, ground corn, and grass.
4. Control external parasites.
5. Keep females and males in separate cages.
6. Out-cross guinea pigs with a pick of the litter (don't inbreed).
7. Put a maximum of ten females with one male.

## Conducting Research with Doers and Non-doers

The next step of the participatory process was to conduct research with the target audience in order to understand:

- ◆ What are people currently doing in relation to the ideal behaviors? What are their actual behaviors?
- ◆ Why do they do what they do? Why are doers and non-doers different? What factors have most influenced doers to perform the ideal behaviors and non-doers not to perform them?

The answers to these questions would assist the Multi-Part team in the next steps of the process—selecting and negotiating target behaviors and developing effective strategies. The research team was made up of a subset of the Multi-Part team: the SUBIR-CARE Project Monitoring and Evaluation Coordinator, three SUBIR-CARE extensionists, and an ATAACU para-legal who had also received extension training. This local participation was a major factor in the success of the field work.

### *Research Techniques*

- ◆ **Structured observation:** The list of ideal behaviors was turned into an Observation Checklist. Interestingly, most (80%) of the behaviors on the list could be observed and only a few of them required verbal report. Some of these behaviors—such as crop rotation, incorporating organic material during soil preparation, and burning only what is immediately planted—were not observable during this particular time of year (June), but could be observed during planting season (September/October). The testing of the checklist in the field indicated that it needed little revision for final application. Because the observers shared a common training in extension work and also had direct experience working in agriculture, inter-observer agreement was high.
- ◆ **In-depth interviews:** The researchers were trained in in-depth interview techniques including non-verbal communication, how to open and close an interview, and questioning and probing techniques before developing the in-depth interview guide. The format of the guide was to ask the farmers about their own practices within each of the eight agricultural categories and why they carried out these practices (what benefits they had obtained), what barriers had they encountered to recommended behaviors, and what they might need to overcome these barriers. The final portion of the guide was a needs assessment concerning suggestions for Project activities during the next phase.

The in-depth interview was an important complement to the structured observation because it allowed the researchers to explore why farmers acted as they did. It also helped corroborate the observational data. For example, recent pesticide or fungicide use could be observed by looking closely at the leaf or fruit of the plant. However, if the researchers didn't observe agrochemical residue on the day of the field work, they couldn't be sure whether or not the farmer had used pesticides or fungicides at some other time during the year. The in-depth interview allowed them to ask farmers about their pesticide and fungicide use. If a farmer reported using agrochemicals, the researchers asked to see them and could then observe exactly which ones the farmer was using and where and how they were stored.

Testing of the observation checklist and the in-depth interview guide during role plays demonstrated that the process was too unwieldy for one person to do alone. The order of the questions depended on where the farmer was when the interview began (at home or in the field) and what the farmer began discussing first (pest control, fertilizer, crop rotation, etc.). The interviewer had to shuffle too many papers to find exactly where to write the answers, disrupting the flow of the interview. The researchers decided to conduct the research in pairs. One person would be the notetaker and one the interviewer. After each interview, the pair would review the observations and notes from the interview, compare what they had seen and heard, and assess inter-observer agreement. Testing in the field demonstrated that this greatly facilitated the process and increased the amount of information that could be recorded during each interview.



*After each interview, the researchers would review the observations and notes from the interview and compare what they had seen and heard (inter-observer agreement).*

## *Sample Selection*

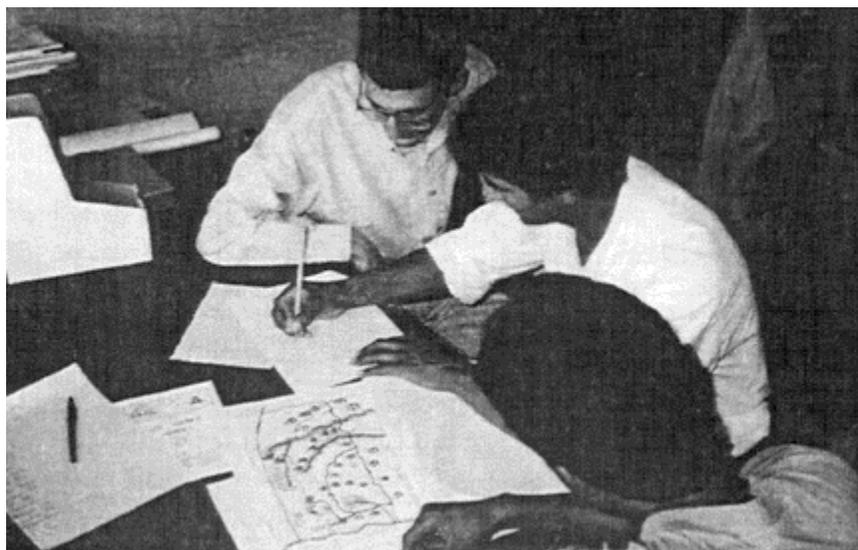
**Selecting communities.** The team first selected two communities from the six in which the Project is currently working (Magdalena and La Esperanza) according to the following criteria:

- ◆ Geographical location--one community in the southern, lower altitude area and one in the northern, higher altitude area;
- ◆ Distribution of the families (relatively close together);
- ◆ Amount of time the community had worked with the Project (one "old" community where the Project had worked three years and one "new" community where the Project had worked for only one-and-a-half years).
- ◆ Communities where the extensionists who were participating in the data collection did not work in order not to bias the results. (Each extensionist is responsible for two communities and makes bi-weekly visits and conducts training courses and other extension activities almost exclusively 'in these communities.) The researchers felt that farmers in an extensionist's own communities would be unlikely to express something negative about the Project or the extensionist's work if he were present during the interview. Indeed, testing of the observation checklist and in-depth interview guide in a community where one of the extensionists involved in the study worked demonstrated that farmers said they carried out certain behaviors "because Manuelito (the extensionist) told them to."

**Selecting families in each community.** Because the list of ideal behaviors included eight practices and more than 30 ideal behaviors, it would be difficult, if not impossible, to identify true "doers" (farmers who perform all of the ideal behaviors, and "non-doers," farmers who do not perform any of the ideal behaviors). The team, therefore, decided to define "doers" as those families who participated with the Project and "non-doers" as those families who did not participate with the Project. The research would help to identify exactly *which* of the ideal behaviors the farmers who participated with the Project were adopting in comparison with the farmers who did not participate with the Project. They then selected a random sample within each group. The following process was used to select the families in the sample.

- ◆ The extensionist responsible for the community developed two lists--one with the names of the families who participated with the Project and one with the names of families who did not.

- ◆ The families on each list were numbered and five families were randomly selected in each group. Three to four "alternate" families were also randomly selected in case the sampled family was not home on the day of the interview.
- ◆ In the field, the team also selected alternate families for geographic reasons. The area is extremely mountainous and farms are separated by varying distances. When it became apparent that the researchers would not be able to reach the goal of ten families due to the amount of time it would take to reach one of the selected families, an alternate family who lived closer by was interviewed. Even so, the team managed to conduct research with only eight families in La Esperanza due to the distances between farms.



*Selecting the sample and planning the field work.*

<b>RESEARCH SAMPLE</b>	<b>MAGDALENA</b>	<b>LA ESPERANZA</b>
Total # of Families	35	32

Families interviewed who worked with the Project	5	4
Families interviewed who did not work with the Project	5	4
Total number of families interviewed	10	8
Percentage interviewed of total number of families in the community	29%	25%



*Mountainous terrain and the distances between farms limited the number of families who could be interviewed each day.*

GreenCOM, SUBIR-CARE, and ATAACU felt it was important to interview women as well as men in order to understand their perspectives concerning the ideal behaviors and future Project activities. As can be observed below, women were the principal respondents in five of the eighteen families. In the rest of the families, if the woman was at home, she was Involved during the needs assessment portion of the interview.

SITE	MEN	WOMEN	WOMEN DURING NEEDS ASSESSMENT
LA ESPERANZA	6	2	4
MAGDALENA	7	3	4
TOTAL	13	5	8



*Interviewing a female farmer and observing the pesticides she uses.*



*Observing the results of the behavior "plant crops on a contour."*

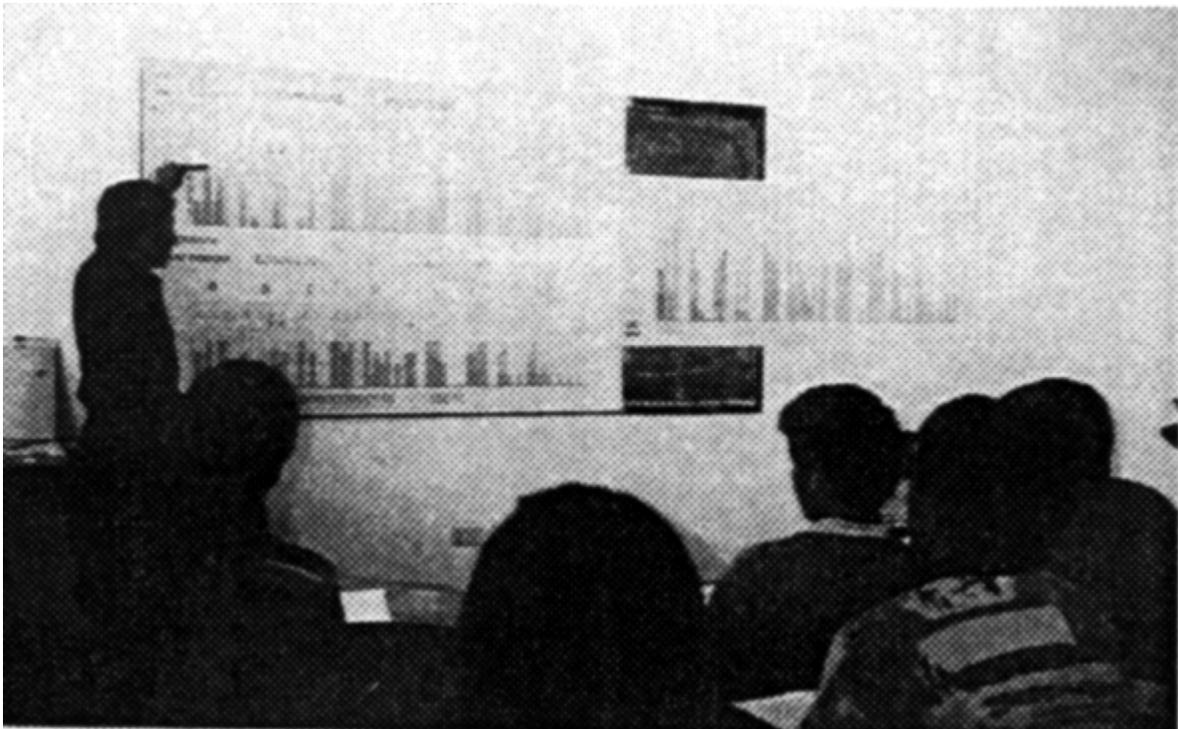


*Observing the results of the behavior, "cultivate at least three ecologically compatible crops in each plot."*

## *Graphing the Results*

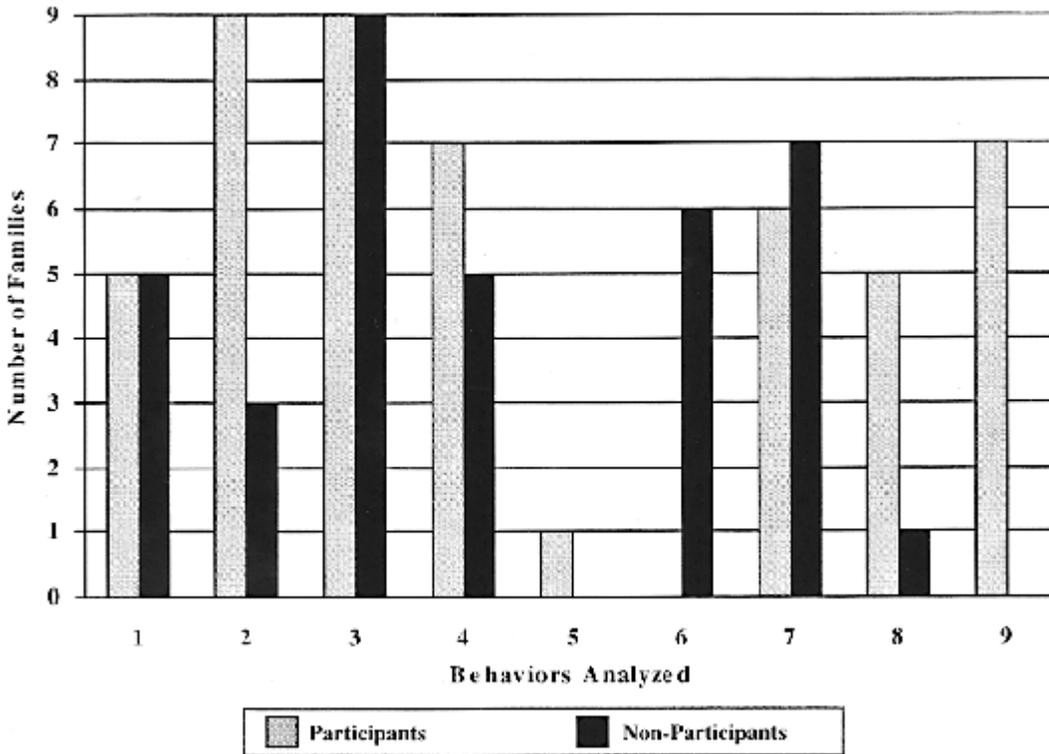
The team graphed the observational data in colorful bar charts on large sheets of flip chart paper in order to make the information more easily understandable to community members and to facilitate their presentation. They first graphed the behaviors for each community, and then combined them in order to highlight overall differences between farmers who participated and did not participate with the Project.

The following is a reduced version of **the graphs which they developed to show the overall differences** between these farmers. The vertical axis represents the number of families who performed the behavior. The light gray bar represents the families who participate with the Project (participants), and the dark gray bar represents the families who do not participate with the Project. The horizontal axis represents the ideal behaviors. The letter describes the behavioral practice—diversification and association, pest control, fertilizers, etc. The number represents the ideal behavior within that general practice, as described in the specific "Key to the Behaviors on the Graph." An asterisk indicates that the behaviors were reported and not directly observed.



*The team graphed the observational data in colorful bar charts on large sheets of flip chart paper in order to make the information more easily understandable to community members and to facilitate their presentation.*

**Figure 1: Comparison of participant and non-participant diversification and association of ecologically compatible crops, pest and disease control, and fertilizer use**



**KEY TO BEHAVIORS:**

**Diversification and association of ecologically compatible crops**

- 1. Cultivates at least three ecologically compatible crops.
- 2. Cultivates at least three income generating crops
- 3. Cultivates at least three crops for family consumption

**Pest and disease control**

- 4. Uses chemical control. (Not the ideal behavior, but observed and graphed as a comparison to the next behavior.)

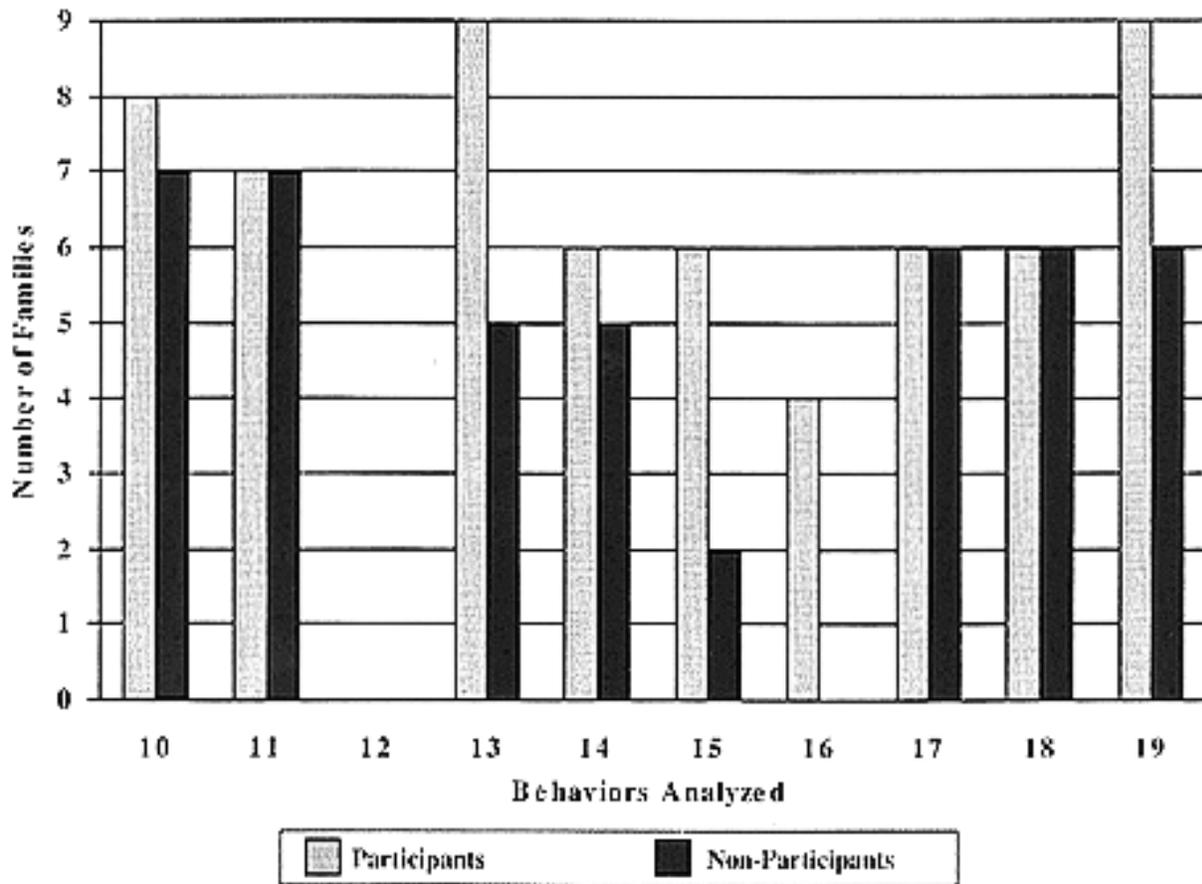
- 5. Uses only "green" label/first category (least toxic) pesticides and fungicides.
- 6. Prepares the soil and lets it lie fallow for at least 20 days before planting.\*
- 7. Rotates short-cycle crops following the local agricultural cycle.\*

**Use of fertilizers**

- 8. Has a compost box.
- 9. Has a worm bed.

*\*Reported behavior, not directly observed.*

**Figure 2: Comparison of participant and non-participant soil quality maintenance, multiple-use forestry management**



**KEY TO BEHAVIORS**

**SOIL QUALITY MAINTENANCE**

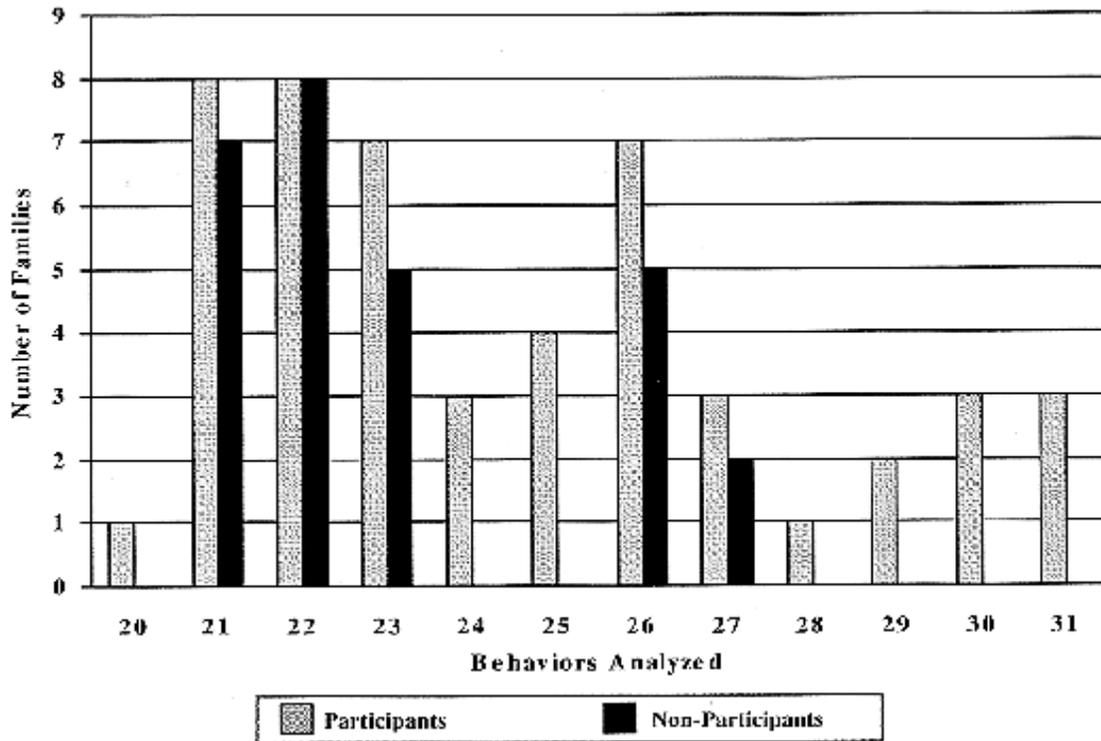
- 10. Incorporates organic material in the soil.
- 11. Grows beans on top of thickets.
- 12. Manages pasture only on slopes of less than 45 degrees.
- 13. Plants crops on the contour.
- 14. Plants trees *within* the plot.
- 15. Plants trees *around* the plot (wind breaks).
- 16. Establishes live fences on a contour within the plot.
- 17. Burns only what s/he will cultivate immediately.\*

**MULTIPLE-USE FORESTRY MANAGEMENT**

- 18. Cultivates existing fallow agricultural land (chaparral) instead of opening up new forest areas.
- 19. Reports that s/he wants to "conserve his/her forest."

*\*Reported behavior, not directly observed.*

**Figure 3: Comparison of participant and non-participant water and water resource conservation, and small animal management**



**KEY TO BEHAVIORS:**

**WATER AND WATER RESOURCES CONSERVATION**

- 20. Does not wash sisal in rivers or streams.
- 21. Maintains (doesn't cut) vegetation for 50 meters around the water source.
- 22. Maintains (doesn't cut) vegetation for an average of ten meters along the banks of rivers and streams.

**SMALL ANIMAL MANAGEMENT**

- 23. Raises guinea pigs. (Not the ideal behavior, but observed and graphed as a comparison to the next behavior.)

- 24. Raises Type One (purebred) guinea pigs.
- 25. Raises guinea pigs in cages or pens.
- 26. Feeds the guinea pigs grass.
- 27. Feeds the guinea pigs ground corn.
- 28. Feeds the guinea pigs salts and minerals.
- 29. Controls external parasites.\*
- 30. Puts females and males in separate cages.
- 31. Puts a maximum of ten females with one male.\*

*\*Reported behavior, not directly observed.*

The results of these data provided interesting insights into the impact of the Project on the ideal behaviors. Specifically, they demonstrated that the Project had a positive impact on the farmers who participated in the Project, in relation to:

- ◆ Income-generating crops,
- ◆ Composting,
- ◆ Worm farming,
- ◆ Planting on the contour,
- ◆ Planting trees around the plot (wind breaks),
- ◆ Live fences on a contour,
- ◆ Knowledge (reported) about the need to conserve existing forest, and
- ◆ Raising purebred guinea pigs in cages or pens.

However, the results also demonstrated unexpected "negative" impact on the behavior of farmers who participated with the Project, in relation to:

- ◆ Use of inappropriate (second and third category and therefore more toxic) pesticides and fungicides: Although the observation demonstrated usage of inappropriate agrochemicals in both groups, more use was observed in families who participate with the Project.
- ◆ Failure to rest the soil for at least 20 days before planting: As farmers change from the traditional method of opening up new fields every two to three years to intensive use of existing plots, they are moving away from this ideal practice.
- ◆ Absence of crop rotation: Some of the crops that farmers were planting due to their involvement with the Project (e.g., tree tomatoes, raspberries, and citrus trees) are long-cycle (five- to ten-year) crops which do not permit rotation.

At the same time, several ideal behaviors varied little or not at all between Project participants and non-participants, specifically:

- ◆ Association of ecologically compatible crops,
- ◆ Cutting thickets to grow beans,

- ◆ Cultivation of crops for family consumption: The research team was unable to explore the quantity of these crops in comparison to the past. In some land intensification projects, income generating crops replace crops for family consumption, causing a negative impact on family diets and malnutrition in women and children.
- ◆ Planting trees inside of the plot,
- ◆ Burning only what they will plant (reported),
- ◆ Cultivating in existing fallow land (chaparral) instead of opening up forest areas,
- ◆ Maintaining (not cutting) vegetation for 50 meters around the spring, and
- ◆ Maintaining (not cutting) vegetation for an average of ten meters along the banks of rivers and streams.

A comparison of the "old" and "new" communities demonstrated that, in general, impact had been greater in the community where the Project had been working for three years; however, the observation also demonstrated significant impact in the community where the project had been working for only one-and-a-half years. The in-depth interviews revealed some of the factors that influenced adoption of the ideal behaviors. The factors varied depending on the target environmental practice.

**Knowledge and skills:** Knowledge of the target environmental practices and the ideal behaviors was generally much higher among Project participants than non-participants. Most Project non-participants simply did not know that the Project and many of the alternative technologies existed.

However, the non-practice of several target behaviors by farmers who participated with the Project was due to lack of knowledge and skills. Either they did not know about the behaviors and/or they lacked the skills they needed to perform them correctly. These included behaviors related to appropriate agrochemical use, association and rotation of ecologically compatible crops, and guinea pig management.

**Access to alternative technologies:** The differences between participants and nonparticipants demonstrated that access to the new alternative technologies provided through Project extensionists' farm visits and training courses is an important factor in the adoption of many of the ideal behaviors.

**Policies and laws:** This factor is particularly important in relation to the use of agrochemicals. The higher the category of pesticide or fungicide (the more toxic), the higher the price, so merchants frequently promote the higher category. There is no

policy requiring that merchants be licensed to sell agrochemicals or be trained in the correct use. Pesticides are not available for sale in Cuellaje. Attempts by Project staff to work with the merchants who sell agrochemicals in the nearby towns where local farmers purchase their pesticides and fungicides have not been successful.

**Immediate, positive consequences:** In general, farmers adopted behaviors—both desirable and undesirable—which increased agricultural productivity and income in the short term (an immediate, positive consequence). They did not adopt behaviors that have long-term (or abstract) consequences related to sustainable land production. During the in-depth interviews, Project participants repeatedly commented on the increased agricultural production they had gained by adopting the new agricultural technologies. However, this immediate, positive consequence had also motivated these farmers to adopt nondesirable behaviors—inappropriate use of agrochemicals, not resting the soil, and not rotating crops. The consequence of increased production was more relevant and immediate than the abstract concept that these toxic agrochemicals might contaminate their soil and water resources in the future.

**Negative consequences:** The in-depth interviews indicated that women could influence their husbands' continued work with the Project. In seven of the 18 families, women were unhappy with their husbands' participation in Project activities, particularly training courses and meetings, because they took men away from farm and household responsibilities and increased women's work. This pressure on husbands could become a negative consequence to their continuing participation in the Project and adoption of target behaviors.

## Selecting and Negotiating Target Behaviors

The next step of the participatory process was to select and negotiate the target behaviors. This was conducted in two workshops, the first in Cuellaje and the second in Quito. The workshop in Cuellaje was attended by the same Multi-Part team members who defined the ideal behaviors. Additionally, farmers from the communities where the research had been conducted were invited to attend. More than 30 people participated. The workshop in Quito was attended by the Project staff who had participated in the first workshop. The research team from Cuellaje and USAID/Ecuador's director of the Agriculture and Natural Resources Office also attended.

The research team first shared the data they had collected and the recommendations they had developed based on them. The team then applied the Behavior Analysis Scale to the ideal behaviors. Due to time limitations, they applied only the criteria of potential impact, cost, and complexity. Possible "ratings" were as follows:

**Potential for impact:** Is the ideal behavior really critical to obtain an impact on this specific environmental problem?

- 3 Has a great deal of impact on the problem.
- 2 Has some impact on the problem.
- 1 Does not have any impact on the problem.

**Feasibility:** Is the ideal behavior really feasible for the audience to perform?

**Complexity:** Is the behavior easily divided into a small number of elements or steps? How much training would it require for people to do it correctly?

- 3 Is very simple to do and does not require a lot of steps. Would not require a lot of training.
- 2 Requires a moderate amount of steps. Would require some training.
- 1 Requires a lot of steps. Would require extensive training to do correctly.

**Cost:** Does the ideal behavior have a reasonable cost in terms of time, energy, money, or materials?

- 3 Has very little cost in terms of time, energy, money, or materials.
- 2 Has a moderate cost in terms of time, energy, money, or materials.
- 1 Has a very high cost in terms of time, energy, money, or materials.

The discussions also touched on the criteria of approximations, compatibility, and consequences, although these were not scored. Questions discussed included:

Are there any existing behaviors that are **approximations** (similar to) to the ideal behavior?

Does the ideal behavior have any immediate observable or perceivable **positive consequences** for the person performing it?

Is the ideal behavior **compatible** with socio-cultural norms or acceptable practices?

Once again, the discussions were very lively with considerable participation from the various perspectives. Participation of local farmers was particularly important to understanding the cost of the ideal behaviors. For example, some of the extensionists perceived that composting had a relatively low cost. However, farmers perceived that it had a high cost due

to the amount of time and energy required to carry grasses and other materials to the compost area. One of the interesting findings regarded the cost of cultivating in existing fallow plots (or chaparral) rather than opening up new forest area. All of the participants agreed that cultivating chaparral had a much higher cost than cutting down forests due to the time, energy, and personal injury involved in clearing brambles and thickets.

The following pages present the results of the application of the Behavior Analysis Scale exercise.

**RESULTS OF THE APPLICATION OF THE BEHAVIOR ANALYSIS SCALE  
CUELLAJE, ECUADOR**

<b>IDEAL BEHAVIOR</b>	<b>POTENTIAL IMPACT</b>	<b>COST</b>	<b>COMPLEXITY</b>
1 Cultivate three ecologically compatible crops	3	2*	2*
2 Cultivate income generating crops.	3	2*	2*
3 Cultivate three crops for family consumption.	3	3	3
5 Use only "green" (least toxic) pesticides/fungicides.	3	1	1
6 Let prepared soil lie fallow for 20 days	3	1	3
7 Rotate short-cycle crops.	3	3	2
8 Have a compost box.	3	2	2
9 Have a worm bed.	3	2	2
10 Incorporate organic material in the soil.	3	2	2
11 Grow beans on top of thickets.	3	3	3
12 Manage pasture only on slopes of less than 45 degrees.	3	1	1
13 Plant crops on the contour.	3	3	3
14 Plant trees within the plot.	3	1*	1
15 Plant trees around plot (wind breaks).	3	1*	1
16 Establish live fences on the contour within the plot.	3	2	3
17 Burn only what is to be immediately cultivated.  (continued next page...)	3	2	2

**RESULTS OF THE APPLICATION OF THE BEHAVIOR ANALYSIS SCALE  
CUELLAJE, ECUADOR**

<b>IDEAL BEHAVIOR</b>	<b>POTENTIAL IMPACT</b>	<b>COST</b>	<b>COMPLEXITY</b>
17 Cultivate existing fallow land (chaparral) instead of opening up new forest area.	3	1	1
20 Do not wash sisal in the rivers and streams.	3	1	1
21 Maintain vegetation for 50 meters around the spring.	3	3	3
22 Maintain vegetation for an average of ten meters along the banks of streams and rivers.	3	3	3
24-31. Raise guinea pigs "correctly."	3	1	1

\*Depends on the crop.

- ◆ **Potential for Impact:** Usually application of the Behavior Analysis Scale results in the elimination of several ideal behaviors. In this case, however, the team members concluded that all of these behaviors were critical for an impact on intensified, sustainable land use. The extensive participation of technical specialists, local extension agents, and farmers in the process of identifying the ideal behaviors probably influenced this outcome.
  
- ◆ **Feasibility:** The chart, "Results of the Application of the Behavior Analysis Scale in Cuellaje," shows that several ideal behaviors were given the rating of "one" for both complexity and cost and, therefore, were considered not feasible for farmers to perform. During the Cuellaje workshop, the team members initiated the negotiation process between the ideal and actual behavior; this negotiation was completed in the Quito workshop with Project and USAID decision-makers. The following are some of the behaviors which were negotiated.

- Use "green" pesticides: Fungi or molds are a major problem during the months of January to May due to the high amount of rainfall. The MultiPart team members in Cuellaje proposed the use of second category or "blue" (intermediate toxicity) fungicides during those months and "green" (low toxicity) and organic fungicides the rest of the year. However, the team decided that this new behavior would need to be tested in farm (behavioral) trials to understand whether it would be feasible for farmers and how effective it would be on pest control. One of the participating farmers offered his farm as a demonstration plot.
- Cultivate on slopes of less than 45 degrees: The structured observation demonstrated that no farmers owned land on slopes of less than 45 degrees and that this behavior, although ideal, was therefore impossible. The Multi-Part team decided that the only feasible behavior was to plant trees as windbreaks to prevent erosion.
- Do not wash sisal in the rivers or streams: The SUBIR-CARE Project is in the process of constructing a pulping mill to process sisal fiber. The team members decided that until this alternative was a reality, the behavior was impossible. They suggested, however, that once the pulping mill was established, it should purchase only unwashed fibers as an incentive for people not to wash sisal in rivers and streams.
- Cultivate existing fallow land (chaparral) Instead of opening up new forest areas: This behavior was not feasible for farmers who lived in higher altitudes where the crops currently promoted by the Project cannot be cultivated. The team proposed that the Project focus on identifying alternative technologies (crops that can provide increased agricultural production and income) for farmers who live in these higher altitudes.

The Multi-Part team also used this analysis to "fine-tune" some of the target behaviors.

- ◆ Farmers were asked to burn off only the land they intended to plant. Local farmers suggested that it was also important to define how people should burn due to the amount of uncontrolled burning which had resulted in the loss of homes and animals in the area. They proposed that "controlled" burning should be defined as "opening fire breaks," and "burning against or into the wind."

- ◆ Farmers suggested adding the behavior "do not burn stubble" in the category of soil conservation. The roots of stubble help to prevent erosion. Once it is burned, the root system dies and the soil is more liable to wash away after heavy rains.
  
- ◆ The results of the observation demonstrated that farmers traditionally plant fruit trees within and around their agricultural plots, and that there was little difference in this practice between farmers who participated and did not participate with the Project. The Project is promoting the cultivation of "improved" or commercially viable fruit trees. The extensionists suggested, therefore, that the term "improved" (commercially viable) be added to the description of the trees mentioned in these behaviors in order to evaluate more explicitly the impact of their work.

The final list of feasible target behaviors resulting from this negotiation process is provided in the following boxes.

**TARGET BEHAVIORS  
SUSTAINABLE LAND USE COMPONENT  
CUELLAJE**

**A. PEST AND DISEASE CONTROL**

1. Use organic and chemical pesticides and fungicides, following the instructions on their labels, in the following way (to be tested in farm trials):
  - Blue label (moderately toxic): January to May
  - Green label (least toxic): October to December
  - Combined (organic and green label): June and July, October and November
  - Organic: August and September
2. Prepare the soil and let it lie fallow for at least 20 days before planting
3. Rotate short-cycle crops between *Leguminosae* (nitrogen-fixing plants) and *Graminosae* (grasses).

**B. USE OF FERTILIZERS**

1. Use organic fertilizers (cow manure, compost, worm manure, among others).
2. Use chemical fertilizer only:
  - when a soil analysis shows that it is necessary,
  - in quantities recommended by the extensionist (minimum quantities),
  - mixed with organic fertilizers.

**C. DIVERSIFICATION AND ASSOCIATION OF ECOLOGICALLY COMPATIBLE CROPS**

1. Cultivate at least three economically compatible crops (association).
2. Cultivate at least three income-generating crops.
3. Cultivate at least three crops for family consumption.

#### **D. SOIL QUALITY MAINTENANCE**

1. Incorporate organic material (weeds, sugarcane pulp, sisal pulp, bean husks, worm manure, and compost. Among others) in soil preparation.
2. Incorporate organic material (weeds, sugarcane pulp, sisal Pulp, bean husks, worm manure, and compost, among others) during the growing season.
3. Grow beans on top of thickets.

#### **E. SOIL CONSERVATION**

1. Plant crops on the contour.
2. Plant "improved" (commercially viable) fruit trees or forestry species *within* the plot.
3. Plant "improved" (commercially viable) fruit trees or forestry species *around* the plot (wind breaks).
4. Establish live fences (grass or sugarcane) on the contour within the plot.
5. Plant trees as wind breaks around pastures.
6. Burn only what is to be planted immediately.
7. Burn fallow land (chaparral) in a controlled way:
  - Opening fire breaks,
  - Against the wind.
8. Do not burn stubble.

#### **F. MULTIPLE USE FORESTRY MANAGEMENT**

1. Cultivate existing agricultural fallow land (chaparral) instead of opening up new forest areas.
2. Don't cut down forest to cultivate pasture or crops.

## **G. WATER AND WATER RESOURCES CONSERVATION**

1. Maintain (don't cut) vegetation
  - for 50 meters around springs,
  - for an average of ten meters along the banks of rivers and streams.
2. Use water resources under a "Sustainable Management Plan" (to be defined with appropriate experts).

## **H. SMALL ANIMAL MANAGEMENT**

1. Raise Type One (purebred) guinea pigs.
2. Raise guinea pigs in cages or pens.
3. Feed the guinea pigs:
  - salts and minerals,
  - ground corn,
  - grasses with high protein content (king grass, sugar cane, corn leaves).
4. Control external parasites.
5. Keep females and males in separate cages.
6. Out-cross guinea pigs with a pick of the litter (don't inbreed).
7. Put a maximum of ten females with one male.

## Identifying Strategies

The final step of the participatory process was to develop education and communication strategies based on the results of the research. The Multi-Part team used the results to identify which factors influence the adoption of the target behaviors and to develop strategies that address and build on those factors.

The Multi-Part team members in Cuellaje and Quito discussed various strategies that could strengthen communication, training, and education activities. Because there were eight environmental practices categories and more than 30 behaviors, the factors which influenced the adoption of the various factors were distinct, and different strategies were needed to respond to each.

- ◆ **Skills deficit:** The chief barrier to performance of many new behaviors by the Project non-participants was skills deficit. Non-participants did not know that the Project and the alternative technologies existed. The proposed strategy is to expand the number of families with whom each extensionist works to at least 50 percent of the families in the six communities where the Project is already working, and to at least 35 percent of the families in the new communities.

Non-performance of several of the target behaviors by Project participants was also due to skills deficits. Either they did not know about the behavior or they lacked the skills needed to perform it correctly. Such behaviors included appropriate agrochemical use, association and rotation of ecologically compatible crops, and guinea pig management. The Project strategy is to increase the number of training courses on these three practices and to focus on the skills farmers need to perform them correctly. The team also discussed the need to develop simple print materials to serve as visual reminders of the behaviors between the extensionists' visits.

- ◆ **Performance deficits:** The absence or incorrect performance of several of the target behaviors was due to a performance deficit. Farmers had the necessary knowledge, skills, and tools, but they were still not performing certain behaviors correctly or at all. The following are examples of strategies discussed to overcome performance deficits.
  - **Increase positive consequences:** One of the principal differences between farmers who performed many of the ideal behaviors and those who did not was that they had experienced positive consequences via increased agricultural production and farm income. During Phase I, farmers who worked with the Project made farm visits outside of the area to observe agricultural practices. In Phase II, extensionists will invite

participants to visit the "best" local farmers- those who are performing the majority of the target behaviors and have received the positive consequence of increased farm income. These cross-visits will acknowledge, reward, and reinforce the farmers who are practicing the target behaviors. At the same time, farmers who are not performing the target behaviors will be able to learn about and observe the positive consequences of adopting them from a credible source of information-a locally successful farmer.

Application of the Behavior Analysis Scale revealed a way to increase positive consequences of another target behavior-appropriate pesticide use. Farmers said that the use of blue label or second category (more toxic) pesticides exclusively from January to May was very expensive. Project extensionists could emphasize that farmers would save money by using these pesticides only a few months of the year.

- **Increase access to appropriate technologies which support the adoption of the target behaviors:** Lack of a local source for appropriate types of pesticides and fungicides was identified as one of the principal **barriers** to correct agrochemical use. One Project strategy could be to identify a local merchant who is willing to sell pesticides and train him or her in their correct use. The merchant could also rent "protection kits" (gloves, boots, masks) for a minimal cost. The extensionists would motivate farmers to buy their agrochemicals from this local source.
- **Promote changes in policy:** the director of USAID's Natural Resource Agricultural Office participated in the Quito workshop and discussed the possibility of promoting changes in policy, such as distributor licensing and training, as a way of supporting correct pesticide use on a national level.
- **Identify new technologies and economic alternatives:** An important activity of the Project during the upcoming months will be to identify alternative technologies--crops that can provide increased agricultural production and income-for farmers who live in higher altitudes.
- **Decrease negative consequences:** Audience research indicated that many wives were unhappy with their husbands' participation in Project activities such as training courses and meetings. Their unhappiness could become a negative consequence that would prevent men from participating in the Project and adopting target behaviors. Although the Project attempted to involve women in Phase I activities (women could participate in any of the training courses), this was obviously not enough

to gain their support. In Phase 11, the Project is developing strategies specifically to involve women in their activities. Project staff and local leaders had identified this need before the research was conducted. However, the data reinforced the need and helped the Multi-Part team identify activities that could be conducted in the short term (training courses in guinea pig management and horticulture) which would provide women with immediate and direct benefits.

## Future Applications in the SUBIR-CARE Project

The Multi-Part team members also identified potential applications of the lessons learned from this experience. In Cuellaje, the results of the target behavior selection process could be used as a basis for:

- ◆ **Standardizing objectives:** The list of target behaviors could be used as objectives for the extensionists' work.
- ◆ **Farmer self-monitoring:** The Observation Checklist would be refined to reflect the changes in the target behaviors. It would include a map of each farm showing areas dedicated to specific crops, contour planting, windbreaks, worm farming, and composting. The extensionist and the farmer could develop this map together. It would be left with the farmer and reviewed and updated as the farmer changed his/her agricultural practices. In this way, the map could provide on-going monitoring and feedback to the farmer on his or her successful adoption of the target behaviors.
- ◆ **Extensionist self-monitoring:** The extensionist could apply the refined Observation Checklist when initiating work with a new farmer and periodically throughout the year in order to evaluate his or her own work.
- ◆ **Extensionist monitoring and supervision:** The extensionist's supervisor could periodically apply the Observation Checklist to farms of several Project participants in each community to evaluate each extensionist's work and provide feedback on what agricultural practices s/he needs to emphasize.
- ◆ **Pre- and post-project evaluation:** The refined Observation Checklist could be applied immediately in all of the Project communities as a baseline and at the end of the two years as one method to measure Project impact.

SUBIR-CARE staff also perceived potential applications for other Project activities:

- ◆ **Apply the intensified land use component in the other Project site:** Project staff felt that, although the general environmental practices such as diversification and association, fertilizer use, and pest control could remain standard in both sites, the target behaviors would be significantly different due to differences in altitude, topography, and crops. They suggested that the process of selecting target behaviors be repeated in the Borbon area.
  
- ◆ **Apply the process of selecting target behaviors for other Project components:** Project staff felt that the process could be equally effective for other components. The marketing and commercialization coordinator was particularly interested in applying the process to the eco-tourism activity in the Borbon area. He recognized that visitors to the new eco-tourism hotel would expect a quality of service that required behaviors (such as level of cleanliness and timeliness of meals and other services) not traditionally part of the indigenous culture. At the same time, he was concerned that visitors' distinct cultural norms and behaviors could have adverse effects on or alienate community members. He felt that the Project process could be useful for identifying target behaviors for both community *members* and tourists and to negotiate feasible behaviors which would be culturally satisfactory to both groups.

# **Annexes**

## Annex A

### BEHAVIORAL RESULTS OBSERVATION CHECKLIST SUSTAINABLE LAND USE COMPONENT CUELLAJE

#### A. DIVERSIFICATION AND ASSOCIATION OF ECOLOGICALLY COMPATIBLE CROPS

*(On the reverse side, draw a map of the farm indicating the location and types of crops cultivated and the results of other target behaviors such as composting, contour-farming, worm farming, etc.)*

\_\_\_ 1. Cultivates at least three ecologically compatible crops.

List: \_\_\_\_\_

\_\_\_ 2. Cultivates at least three income generating crops.

List: \_\_\_\_\_

\_\_\_ 3. Cultivates at least three crops for family consumption.

List: \_\_\_\_\_

#### B. PEST AND DISEASE CONTROL

\_\_\_ 1. Uses chemical pesticides and fungicides. List those observed:

\_\_\_\_\_

\_\_\_\_\_

#### C. FERTILIZERS

\_\_\_ 1. Has a compost pile or box.

\_\_\_ 2. Has a worm box.

#### D. SOIL QUALITY MAINTENANCE

- 1. Incorporates organic material (weeds, sugarcane pulp, sisal pulp, bean husks, worm manure, and compost,, among others) into the soil.
- 2. Grows beans on top of thickets.
- 3. Rotates short-cycle crops between *Leguminosae* and *Graminosae*.

#### E. SOIL CONSERVATION

- 1. Plants crops on the contour.
- 2. Plants "improved" (commercially viable) fruit trees or forestry species *within* the plot.
- 3. Plants "improved" (commercially viable) fruit trees or forestry species *around* the plot (wind breaks).
- 4. Establishes live fences (grass or sugarcane) on the contour within the plot.
- 5. Plants trees as wind breaks around pastures.
- 6. Burns only what is to be planted immediately.
  - 7. Performs controlled burning in fallow land (chaparral):
    - Opens fire breaks.  Burns down-wind.
- 8. Does not bum stubble.

#### F. MULTIPLE-USE FORESTRY MANAGEMENT

- 1. *Cultivates* existing agricultural fallow land (chaparral) instead of opening up new forest areas.
- 2. Doesn't cut down forest to cultivate pasture or crops.

## G. WATER AND WATER RESOURCES CONSERVATION

- 1. Maintains (doesn't cut) vegetation for 50 meters around the water source.
- 2. Maintains (doesn't cut) vegetation for an average of ten meters along the banks of rivers and streams.

## H. GUINEA PIG MANAGEMENT

- 1. Raises guinea pigs:
  - Type One
  - Type Two
  - Criollo
- 2. Raises guinea pigs:
  - In cages
  - In pens
  - In the kitchen
- 3. Feeds the guinea pigs:
  - Salts and minerals
  - Ground corn
  - Grass
- 4. Keeps females and males in separate cages.
- 5. Puts a maximum of ten females with one male.

## Annex B

### BEHAVIORAL STEPS OBSERVATION CHECKLIST CORRECT PESTICIDE USE

(ASK THE FARMER TO MIX AND APPLY A PESTICIDE AND OBSERVE THE FOLLOWING.)

- Stores pesticides in a place where children and animals cannot reach them.
- Uses the correct pesticide (first or second category).
- Uses the correct amount of water.
- Uses the correct amount of pesticide.
- Wears shoes that cover the entire foot (not sandals) while mixing and applying the pesticide.
- Wears gloves while mixing and applying the pesticide.
- Wears a covering over the mouth while mixing and applying the pesticide.
- Applies the pesticide while facing "downwind."
- Cleans the pesticide container in a way that does not contaminate streams and/or drinking water.
- Washes hands after applying pesticide in a way that does not contaminate streams and/or drinking water.
- Disposes of pesticide container in an appropriate manner (buries or burns).
- Does not use pesticide container to store water or food.

(This checklist is provided as an example. It has not been tested in the field.)

## Annex C

### Glossary

**Antecedents:** Events which set the stage for or trigger behavior. Antecedents can be naturally occurring or can be introduced as a part of an education or communication activity. Important antecedents include knowledge concerning when and how to carry out a behavior, or skills needed to perform it.

**Approximation:** An approximation is a behavior that is similar to the ideal behavior, but is not performed correctly or at the right time, duration, or frequency. An effective education and communication strategy builds on approximations by reinforcing those aspects of a behavior that people are doing well and correcting what they need to change.

**Behavior:** A single, observable action that a person carries out under specific circumstances.

**Behavior analysis scale:** A tool to help select and prioritize target behaviors. A multidisciplinary, multisectoral, and multilevel team rates behaviors using six criteria: potential for impact on the environmental problem, approximations, positive consequences, compatibility, cost, and complexity. The resulting "score" helps the team to see which behaviors have the most potential for impact on the specific environmental problem and which are feasible for people to do.

**Behavior trial:** A research technique designed to test behaviors with a small number of the target audience. A researcher actually observes behaviors and notes how the "respondent" adapts them to his/her circumstances and setting.

**Closed-ended questions:** Questions that can be answered with a yes/no or other one word answer.

**Consequences:** Events that follow a behavior. The belief that certain events are consequences of a behavior will strengthen, weaken, or eliminate a person's intention to perform the behavior. Generally, people tend to repeat behaviors that lead to positive results or benefits (positive consequences) and to avoid behaviors that produce negative results (negative consequences). Consequences are most powerful when they occur immediately following the behavior (rather than after some time delay), are concrete rather than abstract, and are relevant and meaningful to the person performing the behavior.

**Convenience sample:** Respondents are selected on the basis of their accessibility and convenience to the researcher. Respondents are selected at central locations where people similar to the target audience gather.

**Doers:** Men and women who are regularly performing the ideal behavior. These are often called "adopters" or "positive deviants" because they deviate from the norm in a positive direction.

**Environmental practice:** A series of several related behaviors which, taken together, could have an impact on an environmental problem.

**Focus groups:** A qualitative research technique in which a moderator or facilitator leads a small homogenous group of respondents through a discussion on a selected topic. The facilitator uses a prepared list of probing questions to collect information, but at the same time allows participants to talk freely and spontaneously about the topic.

**Ideal behaviors:** Single, observable actions which technical specialists consider people should perform in order to reduce or help resolve a specific environmental problem.

**In-depth individual interviews:** A qualitative research technique in which a trained interviewer discusses a topic with an individual respondent one-on-one. Interviews are characterized by extensive probing and open-ended questions.

**Inter-observer reliability check:** A technique used by the research supervisor during field work to assess the reliability of observational data. The supervisor asks two researchers to observe the same activity and compares the scoring on their instruments. The data are considered reliable if the researchers agree on 80 percent or more of the items. Reliability checks should be carried out on 25-30 percent of the total number of observations.

**Leading questions:** Questions which "lead" people to give the answers they think the interviewer or facilitator wants. Leading questions begin with phrases such as "Don't you think that.....?" "Don't you agree that.....?" "Isn't it right that.....?" "I think....What do you think?"

**Multi-part team:** A multisectoral, multidisciplinary, and multilevel team that undertakes the participatory process to select target behaviors described in this guide. The use of a Multi-part team helps develop consensus among diverse, and sometimes disparate, people needed to introduce, support, perform, and maintain target behaviors.

**Non-doers:** Men and women who are *not performing* the ideal behaviors. These are often called "non-adopters."

**Open-ended questions:** Questions that allow people to talk about what they think, do, and feel. They typically begin with the words why, how, and what, or phrases like "Tell me about...." "Explain to me...." "Describe...." Open-ended questions have no right or wrong answers. They invite people to describe their own life experiences.

**Performance deficit:** A situation in which the target audience has the necessary knowledge and skills, but is still not performing a target behavior correctly or at all.

**Probing techniques:** Techniques used by social science researchers to explore what a respondent is saying. Common probing techniques include remaining silent for a few moments to give a respondent time to think about what s/he wants to say, repeating the respondent's words as a question, asking the respondent to place him/herself in the position of another person, and asking the respondent to explain further.

**Respondent:** A person being interviewed in an in-depth interview or survey.

**Random sample:** Respondents are selected randomly from a list of all of the potential respondents in a specific area.

**Sample:** A research sample is the portion of the target audience who will be observed and interviewed during the audience research. The sample must be representative, i.e., it must reflect the characteristics of the group from which it has been taken.

**Self-efficacy:** How skilled a person feels about managing a new behavior. This perception can influence a person's behavior and can be changed to facilitate adoption of the new behavior.

**Skills:** Abilities needed to carry out practices correctly.

**Skills deficit:** A situation in which a person lacks specific information, tools, or abilities to perform a behavior correctly.

**Social norms:** Patterns of behavior that are perceived by a given group to be widespread or socially acceptable. The approval of certain leaders or "important others" in a community also helps establish whether a practice is the norm. These "important others" can influence whether people adopt a new behavior. Important others might include parents, friends, relatives, neighbors, and clergy, politicians, etc.

**Structured observation:** A research technique in which investigators observe people's actions or the results of those actions using a previously designed observation form (usually an observation checklist). By using structured observation, researchers need not rely on self-reporting to learn how a person behaves in his/her natural setting, but rather have direct evidence of the behavior.

**Systematic sample:** A variation on the random sample in which one house out of every 'x' houses (one house out of five, for example) is interviewed. The number 'x' is randomly selected.

**Target audience:** The specific groups of people who will be reached or influenced by the education and communication activities. *Primary audiences* are considered those people who would actually perform the target behaviors. *Secondary audiences* are those people who influence the primary audience and who could teach, support, and reinforce their behavior.

## Annex D

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