

**INTENTIONALLY SUSTAINABLE:  
HOW COMMUNITY-BASED RESOURCE MANAGEMENT  
ENABLES AND ENCOURAGES THE  
SUSTAINABLE USE OF RESOURCES**

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# INTENTIONALLY SUSTAINABLE: HOW COMMUNITY-BASED RESOURCE MANAGEMENT ENABLES AND ENCOURAGES THE SUSTAINABLE USE OF RESOURCES

## EXECUTIVE SUMMARY

Community-based resource management (CBRM) is a powerful mechanism to help people change from using resources unsustainably to using them sustainably. It helps people see that using resources sustainably is in their own interest, gives them tools to do so, and helps establish the conditions to use those tools. This paper presents a framework to explain how CBRM programs can accomplish this and shows how gender concerns that affect CBRM efforts fit in the framework.

The framework is based on the economic principle that people use resources in the way that provides them the most benefit. If using up a resource today will provide the greatest benefit, the user will do so. However, to use resources sustainably, people must forgo using part of the resource now to ensure future benefits. To forgo short-term benefits, resource users must expect to gain more by preserving some of the resource today to obtain benefits tomorrow. They must also be willing to wait for the future benefits. In successful CBRM programs, every activity increases either the benefits people expect from a resource or their willingness to wait for future benefits, or both.

The focus here is on increasing the tangible, economic benefits that people perceive they derive from a resource. That is not to suggest that economic benefits of resources are greater than cultural benefits, or that economics reflects the complete value of a resource. However, economic benefits are arguably the easiest tool to use to convince people to change how they use resources. Thus, this paper discusses how CBRM can help people obtain tangible benefits from resources into the future so they can use resources sustainably.

CBRM can affect different socioeconomic groups in communities differently. This paper highlights the role of gender issues to illustrate how these socioeconomic concerns can affect the outcomes of CBRM programs and offers guidelines to manage them. Addressing these issues and changing how people use resources can be complicated and time-consuming. It also is likely to cause conflict. CBRM programs that commit the time and effort to manage conflict and socioeconomic concerns, such as gender issues, are likely to be more effective.

### INCREASING EXPECTED BENEFITS

Most CBRM activities increase expected benefits. By definition, expected benefits = (likelihood of obtaining benefit) x (benefit value). The value of benefits and the likelihood of obtaining them today are more certain than the value and likelihood of possible future benefits. CBRM increases how much people expect from their resource by increasing both the likelihood of obtaining future benefits and their value.

#### *Increase the Likelihood of Benefiting From Sustainable Use*

Successful CBRM programs help communities feel more certain of obtaining benefits from resources in two ways — they ensure that the community controls the resource and they provide information needed to use

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the resource sustainably. By controlling a resource, the community can be certain that it can use the resource tomorrow if it preserves it today. Establishing effective control of community-managed resources is critical for CBRM to succeed. However, it is not sufficient. Communities also need information and skills to manage and sustainably use resources they control. CBRM programs can provide this information and training.

Three conditions are necessary for a community to control a resource. The community must know what its resource rights are, be sure they are enforced, and be sure the government or others will not rescind them. Knowing its rights lets the community plan what to enforce. Being able to enforce its rights ensures that others cannot take resources that the community preserves for future use. Being sure that the government will not rescind the rights ensures the community can anticipate that it will retain control of resources it invests in or preserves.

It does not matter whether the community or the government enforces the community's resource rights, as long as the community feels its rights are enforced. However, there are advantages to involving the community in enforcement – lower government enforcement costs, fewer opportunities for corruption, more communication between the community and local government, greater community commitment to its management plans, and peer pressure can be used to enforce rules within the community.

CBRM programs also need political support to succeed. Without this support, the government or other groups may be able to abrogate a community's rights to a resource. This is especially a risk if community efforts to preserve or maintain the resource increase the resource value.

CBRM programs may need to help communities, national and local governments, and the judiciary build the skills needed to protect community resource rights. Within communities, women often face additional difficulties enforcing their resource rights. In some places, others in the community can easily appropriate the benefits of resources women use. Under these conditions, women will be less certain about receiving future benefits from resources they use, giving them less incentive to support CBRM efforts. CBRM programs can ensure that women's resource rights are enforced to the same extent as men's and are as secure as men's.

Many communities need additional information and skills to obtain the full benefits of resources they control. Since men and women tend to use different parts of resources, they may need different information to fully benefit from CBRM efforts. Still, many programs provide information about using resources to men, but not to women, even when women are the main resource users. This limits women's ability to benefit from their resources. CBRM programs that explicitly involve women in relevant training will build more support among women.

### ***Increase Benefit Value***

The value of resources to people comes from the things derived from the resource (goods) and the services the resource provides (both economic and social/cultural). There are four ways to increase economic value: market more of the goods and services (g&s) used; market new g&s; increase the price for g&s; and decrease the cost of marketing g&s. Specific steps that CBRM programs can take are listed below. The paper provides numerous examples for each.

To increase the market price and market more g&s, CBRM programs can:

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- *Link benefits to resources* — Successful CBRM programs help communities tangibly benefit from their resources. CBRM programs can help communities identify new ways to use resources and understand how their present use damages a resource. In identifying the parts of a resource to value, CBRM programs can maximize the value of the resource by considering the different parts of a resource that men and women use.
- *Increase market price of resource g&s* — Men and women tend to have different roles in marketing. CBRM programs that identify and account for these roles will have the greatest success in helping communities improve their marketing and identifying more ways to increase the resource value.
- *Remove restrictions on marketing g&s* — Restrictions can range from complicated regulations to inadequate infrastructure or lack of information. In many places, women may face additional restrictions than men. CBRM programs can help identify and overcome these constraints and can work with national agencies to eliminate or revise burdensome regulations.
- *Create markets for new or unmarketed g&s* — CBRM programs can help communities identify aspects of their resources that they do not market.
- *Create competition among buyers* — Many CBRM programs have increased the value of resources by ensuring more than one buyer for a community's goods. Existing buyers may resist this and CBRM programs may need local or national political support to overcome this resistance.

To lower relative costs of sustainable uses:

- *Lower capital, time, and transaction costs to produce and market g&s* — There are many ways that CBRM programs can lower each of these costs. Lowering capital costs may be particularly helpful for communities that are trying to promote ecotourism. Women face different constraints to accessing capital, have different time constraints, and face different transaction costs than men. Thus, different activities may be needed to lower the costs of using resources for women and for men.

A particularly onerous cost women face that can limit their participation in CBRM is violence from men as women begin to participate in decision-making. Some NGOs are addressing this problem by helping communities openly discuss how men are threatened by women's participation, and how violence affects the community.

- *Provide information communities need to benefit from resources* — To most effectively provide communities with the information they need to use resources sustainably, CBRM programs need to consider how people obtain information. Men and women get information from different places and at different times, so CBRM programs need to target information through different channels to reach men and women.
- *Increase costs of using resources unsustainably* — As the cost of using a resource unsustainably increases, the relative cost of using it sustainably decreases. There are many ways to increase the cost of unsustainable uses, including:
  - revising government regulations that provide incentives for unsustainable use;
  - improving enforcement of regulations and community plans for sustainable uses;
  - publicly disclosing names of people or firms which practice unsustainable uses;

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- increasing the cost of equipment needed to practice harmful resource uses; and
- instituting market-based incentives to discourage unsustainable resource use.

Many of these options will require national-level action — another reason for CBRM programs to integrate their efforts from the community to the national level.

### **INCREASING PREFERENCES FOR FUTURE BENEFITS**

Increasing the expected benefits of a resource will encourage people to forgo current gains to ensure greater future gains. CBRM programs can also increase people's desire for those future gains in at least three ways: by meeting their basic needs; by increasing people's sense of control of their lives; and by ensuring access to credit at commercial rates.

#### ***Meet Their Basic Needs***

Many CBRM programs include activities to increase incomes of resource users and to decrease their dependence on natural resources. In doing so, many programs target activities to assist women, though they may provide little more than subsistence-level income. Income-generating activities will be most effective if designers consider the productive skills of the participants and research the local markets before designing the activity.

#### ***Increase People's Sense of Control of Their Lives***

As people make more of the decisions on how to use their resources, they will gain more sense of control of their lives. As a result, they are more likely to consider the implications of how they use those resources. Thus, the most effective CBRM programs involve resource users in every stage of decision-making, from identifying problems through implementing solutions. CBRM programs can ensure that the various groups within a community participate in the decisions. This will decrease opportunities for corruption and favoritism. To ensure that women as well as men support CBRM efforts, programs need to explicitly include women in decision-making.

#### ***Ensure Access to Credit at Commercial Rates***

It is difficult for a community to value future benefits from a resource if it needs to use the resource to repay loans at 20-200 percent interest. CBRM programs can help communities value future benefits more by ensuring access to loans at commercial interest rates. In doing so, the programs must recognize that men and women have different access to credit and may need different mechanisms or assistance in this.

### **ATTITUDE MATTERS**

The paper provides examples of spillover effects that communities are enjoying from organizing to manage their resources, such as working together to solve other problems, supporting other's efforts to manage resources sustainably, and becoming more involved in local governance. Attitudes of participants also shift

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as they see themselves as resource preservers and not just resource users. CBRM programs are also opening many opportunities for women that they have not had before. These changes create potential public support for national efforts to encourage and enforce sustainable use of resources.

### **CONCLUSION**

To be effective, CBRM requires a long-term commitment to provide technical support and training at the local and national levels. Also, because CBRM works by helping people use resources, other tools such as resource preserves may be needed to augment CBRM to protect critical biodiversity resources. In addition, because population growth will overcome any gains from CBRM in the long run, programs can provide greater long-term gains by ensuring that communities have access to the reproductive health services they want.

CBRM can ensure that people who use resources have the incentives and the skills to manage those resources so they will provide benefits into the future. Women and men face different constraints to benefiting from CBRM efforts. CBRM programs that address these differences in activities will more effectively ensure that both women and men support CBRM efforts. While CBRM is only a tool to achieve the goal of sustainable resource use, it is probably the best tool available to enable and encourage people in many countries to use resources sustainably.

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## INTRODUCTION

People who use resources sustainably do so intentionally. For people to choose to use resources sustainably requires only two conditions — that they prefer to, and that they can. Community-based resource management (CBRM) programs can help establish the conditions that enable and encourage people to use resources sustainably. This paper offers a framework to explain why CBRM programs can so effectively establish these conditions. It is intended to be a guide for CBRM practitioners to identify objectives to target to make their programs as effective as possible.

The framework builds on the economic premise that people use resources in the way that provides them with the greatest benefit over time. For a resource user, two factors determine which use will provide the most valuable benefits: 1) the amount they expect to gain from the resource; and 2) whether the benefits occur when the user wants them (now, or in the future) (Pearce and Warford, 1993; Callan and Thomas, 1996). While most people do not consider these factors explicitly, they are implicit in their behavior. This paper shows that every activity in effective CBRM programs addresses some aspect of these two key factors.

The paper is organized to show how the two factors lead to sustainable use of resources, and to identify the kinds of activities that directly affect them. The first factor — how much a user expects from a resource — is broken into the key underlying questions: 1) can I be sure to benefit from the resource in the future?; and 2) how much can I gain from the resource? This section outlines the range of conditions and incentives that affect the answers and how CBRM programs can change these conditions and incentives. For the second factor — whether the benefits occur when the user wants them — the paper shows how CBRM programs can directly and indirectly affect people's preferences. For both factors, it suggests steps that CBRM programs can take to be more effective, particularly in integrating gender concerns in CBRM.

The paper highlights gender concerns to illustrate how socioeconomic issues can affect the outcome of CBRM. Successful CBRM programs help communities balance the interests and needs of their different socioeconomic groups, such as indigenous people, rich and poor, ethnic or religious groups, men and women, etc. Effective programs recognize how different community groups use resources and are affected by resource use, and how they participate in deciding how to use resources. Gender differences are perhaps the most commonly overlooked socioeconomic issue that CBRM programs encounter.

In managing gender and other social issues, the outcomes that CBRM programs can work toward are straightforward and include enforcing both women's and men's resource rights. However, accomplishing these outcomes can be complicated and time-consuming. It requires understanding the roles of men and women in communities and in using resources. The framework presented here can help CBRM programs identify how gender concerns can affect program outcomes. Programs will likely need explicit effort to address gender concerns; the gender-analysis literature provides more details on how to accomplish this than are discussed here. However, gender issues affect most aspects of CBRM. Programs that address these issues will likely be more effective at helping communities use resources in ways that are socially and economically, as well as ecologically, sustainable.

CBRM programs succeed by getting people to change how they use and relate to resources. These changes generally also require that people change how they relate to each other. If CBRM succeeds, some people will have less access to resources while others will gain more control of resources they depend on. These and other changes that CBRM brings will likely cause conflict between groups in the community, and between the community and outside resource users and regulators. The most effective CBRM programs will anticipate this conflict and be prepared to address it. This aspect of CBRM is discussed briefly, but conflict can arise more often in CBRM than is noted here. In many cases, the success of CBRM depends on how well this conflict is managed. But even in managing the conflict, the ultimate objective is to increase the long-term benefits that users receive and perceive from their resources.

This paper focuses primarily on influencing economic benefits to a community. However, in no way is this intended to minimize the social or cultural value of natural resources. Many communities protect sacred areas because they value the sacredness more than the economic returns of extracting resources from the area—for instance, many indigenous people do not take forest products from sacred forests; the American public has repeatedly protected the Grand Canyon from being converted into a reservoir for a hydroelectric plant. A CBRM program may be able to encourage conservation by reminding people of the social or cultural value of an area through an awareness campaign. However, convincing people to change how they use resources to maintain the social/cultural aspects of resources can be difficult and generally takes a long time to have an impact. With communities that derive part of their livelihood from natural resources, dealing with the economic value of those resources is often more effective in the near term.

This is not to suggest that economic value reflects the total value of resources. Economic value only reflects the aspects of a resource that people are willing and able to identify and that benefit people. Since we do not fully understand how ecosystems work, or all of the benefits they provide, any economic value of a natural resource is only a rough minimum value. However, economic value is the benefit that is most easily identifiable for most people, and the easiest one for many people to relate to. It is arguably the most powerful tool available to convince people to change how they use resources to ensure that they can continue to benefit from the resource into the future. This paper therefore focuses on how to enable and encourage people to use resources so they can enjoy tangible benefits from the resources in both the future and the present.

## **BASIC PREMISE**

Because the process of CBRM varies to suit the different needs and conditions of people and nature in each locale, it is difficult and not particularly useful to define CBRM precisely (Western and Wright, 1994). The difficulty stems from the myriad definitions of “community,” “resource,” and “management.” While the details of CBRM vary, however, the overall approach of CBRM programs is consistent—support the people who use a resource to decide who can use it and how, and to implement their choices. CBRM reverses the top-down approach of government institutions determining how resources are to be used, relying on strict enforcement to control access to them (Wells and Brandon, 1993). “In the broadest sense, [CBRM] includes natural resources or biodiversity protection by, for, and with the local community” (Western and Wright, 1994, p. 7). Effective CBRM helps communities identify options that will offer meaningful improvements in the quality of their lives and understand the implications of their choices. It helps communities develop the skills and knowledge needed to effectively manage their resources for sustainable use. This goes far beyond merely asking a community what it wants to do with its resources in a rapid appraisal and then giving them the means to achieve their stated desire.

CBRM helps people choose to use resources sustainably. Economics offers a useful beginning premise to explain how: People use resources in the way that they believe will provide them with the greatest benefit. This premise underlies all of economics. It explains why people choose to use resources sustainably rather than unsustainably, and how CBRM affects this choice. If people can gain the most by using all of a resource now, they will do so. If they will gain more by using part now and part in the future, they will do that. Using all of a renewable resource now can be a sound economic choice in some cases. But it is not sustainable. To be ecologically sustainable, users must forgo some immediate benefits from the resource to ensure that part of it will always be available in the future. Effective CBRM helps people recognize the value of these future benefits and provides the control, information, and skills that resource users need to obtain them.

Worldwide, very poor people are forgoing today's gains to ensure greater future benefits. For example, many Philippine communities stopped slash-and-burn farming when they received formal control of the forests and technical support to manage them (B. Harker, personal communication, 1997). Control of the trees allows communities to forgo the short-term benefits of burning off the trees to farm the land for the long-term benefits of using the forest sustainably. As another example, from Kenya to Ecuador to Indonesia, fishers are voluntarily setting aside prime fishing grounds to preserve fish breeding stocks. They are giving up the catch from these sanctuaries today to ensure larger future catches from surrounding areas (Coastal Resources Management Project II, 1998).

CBRM programs can affect two basic factors to encourage people to preserve resources for the future (Figure 1):

- *How much* people anticipate to gain from their resource over time (each month, year, decade, whatever) — the amount of benefits they *expect* from the resource; and,
- *When* they want the benefits from the resource — how strongly they *prefer* to receive benefits today (this month or year) versus tomorrow (next year, next generation, etc.).

The extent to which a CBRM program changes these basic factors will determine how successfully the program helps people use their resources sustainably. (CBRM does provide other benefits besides a more sustainable use of resources, such as increased local participation in governance. However, these additional benefits mostly occur as a result of a community successfully participating in managing their resources. Thus, even these benefits that are not directly related to resources depend on how well the CBRM program affects the community's use of its resources.)

CBRM offers many ways to affect these two factors. Which activities to pursue in a given program depends on the institutional, governmental, social, economic, and ecological conditions in which the program must work. Some activities will develop alternative uses, such as new markets for non-timber forest products. Others will remove constraints, such as a lack of credit at commercial interest rates. Regardless, activities will have the most lasting impact if they are targeted to increase the benefits people expect from the resource and/or how much they want future benefits.

### **INCREASING EXPECTED BENEFITS**

By definition, the benefits that people expect from a resource depend on two variables: 1) the value of the benefit; and 2) the likelihood that the benefit will be achieved (expected benefit = benefit value x likelihood) (Weimer and Vining, 1992). People know fairly well how much they can gain from using a resource today —

for example, a small forest holder knows the price for timber this week and is certain he can cut his trees this week. Thus, he is fairly certain of the benefits of cutting timber this week. However, many of the benefits of using resources sustainably occur in the future. Future benefits are less certain than the benefits of using resources today. A woman farmer may increase her income by planting trees to prevent soil erosion, improve crop yields, and provide wood to sell. But her brother or husband may take her crops if her conservation efforts succeed, or destroy the trees so she cannot claim land rights. Women in many countries cannot be sure which outcome will occur. This uncertainty greatly lowers their expected benefits of planting trees; women in such situations have little incentive to invest time and energy in conservation. To forgo the certain benefits of using up resources now and instead use them sustainably, either the amount or likelihood of future gains must increase, or both.

CBRM succeeds in large part because it offers a variety of activities to affect both the likelihood and size of the benefit that people can gain from the resources they use. Many of these activities are far more effective when they address the gender aspects of the variable. For example, a program to decrease rural fuel wood consumption in El Salvador worked with women to promote fuel-efficient stoves. For women, the new stoves decreased the amount of time needed to collect fuel wood. However, the men expected women to keep a fire going constantly, so the home would feel cheery and they could have fresh tortillas at any time. So while women used most of the fuel wood, both men and women influenced fuel wood use, but in different ways. Thus, the awareness campaign targeted different messages to women and men (Grieser and Rawlins, 1996). Programs need to incorporate such gender differences — who uses resources and how — to increase the community's certainty and amount of benefits from the resources as much as possible.

### ***Increase the Likelihood of Benefiting from Sustainable Use***

Perhaps the most significant contribution of CBRM programs is that they increase the confidence of resource users that they will benefit from their local resources. The most successful programs reported in the literature accomplish this in two ways. They increase local control of at least some aspect of resources, and they provide communities with information and skills needed to benefit from that control (Figure 2).

If a community controls a resource, it can be certain that it can use that resource in the future if it wants to. It can also be certain to benefit from any effort to maintain or improve the resource. The certainty of obtaining the future benefits allows the community to choose to forgo current benefits to ensure future benefits. Thus, the more likely the users are to benefit from the resource in the future, the more likely they will use the resource in sustainable ways. Community control is a powerful mechanism to accomplish this.

However, control of a resource may not be enough to allow a community to increase how much it benefits from the resource. The community may also need information and new skills to do so. Increased control, information, and skills together can increase the likelihood of obtaining benefits in the future from a resource.

### **Establish Effective Control of Resources**

Community control of resources can take many forms. Of the community forest management programs discussed in the reviewed literature, the more successful ones seem to be those that transfer formal title of the forest to the community, such as in Mexico (Galletti, 1998) and the Philippines. In these cases, resources

become communal property, managed by committee. Other community forest programs, such as in Costa Rica (Donovan, 1994), Guatemala (Gretzinger 1998), and Nepal Royal Chitwan National Park (Larson et al., 1998), seek to manage community use of government-owned forests. The BOSCOA program in Costa Rica has also organized individual landowners to manage their privately held land as a community (Donovan, 1994). Many CBRM programs that aim to maintain wildlife transfer management of the wildlife to communities while the government retains title to the wildlife and land (in a park, reserve, etc.; IIED, 1994). The Zimbabwe CAMPFIRE program transfers responsibility to manage wildlife to local districts and also establishes a mechanism to transfer revenue received from wildlife to the districts (Metcalf, 1994). In Ilengesi, Kenya, the communities own the land and together manage the wildlife resources as communal property (D. Western, presentation, 1999). Under the Philippine coastal-zone management program, the local or national government may delegate management of a reef, mangrove forest, or other coastal resources to a community.

To effectively control a resource, a community must be able to: exclude others from using it; enforce their resource rights; and be secure that these rights will continue (Panayotou, 1993). (If the community can also transfer the resource rights, there are additional ways they might use the resource. But many legal/political systems that convey use rights to communities do not convey ownership rights. In these cases, the community's rights may be exclusive, enforceable, and secure, but not transferable.) Being able to exclude others from using the resource ensures that the community can reap benefits in the future that it forgoes today, including benefits from investments to maintain the resource. If the community can enforce its rights, other groups cannot unilaterally take the resource and deprive the community of future benefits. If its rights are secure and cannot be rescinded, the community will be able to anticipate using the resource far into the future. All three conditions are needed for a community to be able to anticipate future benefits from a resource, and to use it sustainably.

Perhaps the most significant concern for CBRM planners and managers is to ensure that the community can enforce its resource rights, exclude others from using the resource, and ensure that those rights are secure. To do so, a community must:

- Know what rights it has;
- Be able to prevent unauthorized use of the resource; and
- Be sure that other groups, governments, or individuals will not abrogate their rights.

### *Know What Rights the Community Has*

A community can only enforce rights that it knows about. CBRM programs can ensure that communities know what their rights are and the options they have to enforce them. Awareness campaigns are useful for this. For example, in the Kundwara area of Madhya Pradesh, India, some villages believed they were entitled to 50 percent of the proceeds from the final harvest of timber trees, when they were legally entitled to only 30 percent. Villages were also unaware that they were entitled to 100 percent of revenue from harvests to thin the forest. This confusion prevents the Joint Forest Management program from being properly implemented (Kant and Cooke, 1998).

Communities will make more informed decisions about their resources if the whole community understands what the communal and individual rights to the resources are. Women, the poor, indigenous people, and other marginalized groups often have much less access to information about their rights than most men do.

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For women, high illiteracy rates, social restrictions on mobility and interactions with men, and/or additional time constraints due to household responsibilities may limit where, when, how, and from whom they can obtain information. CBRM programs can thus be more effective if they explicitly ensure that women and other marginalized groups are thoroughly informed of their user rights. For example, a study found that most women in Niger are not aware of their legal rights, including their right to own land. The study recommended that an awareness campaign be targeted to inform women of their land rights (Grieser and Rawlins, 1996).

### *Prevent Unauthorized Use of the Resource*

Community members must know unequivocally that people both within and outside the community will not use the community's resources without community permission. This requires effective enforcement, political and institutional support, and equitable protection of the rights of all community members.

Some of the more effective enforcement occurs where communities are trained and work with official enforcement agencies. In the Ilengwesi area of Kenya, the communities were trained and are backed by the Kenya Wildlife Service to patrol their land and prevent wildlife poaching. The communities received assistance to obtain radios, weapons, and uniforms, and have developed one of the most effective wildlife patrol groups in Kenya (D. Western, presentation, 1999). In the Philippines, community volunteers are trained by the police or Coast Guard as Bantay Dagat, or coastal watchers, and are deputized in some cases. When they spot illegal or destructive fishing or mangrove harvesting, they apprehend the intruders or contact the police or the Coast Guard to do so. They are recognized by local governments as an important part of the effort to enforce sound coastal management plans, which their communities help create (A. White, personal communication, 1997).

The objective of enforcement is both to protect the resource and to ensure that the community believes its rights will be protected. It does not matter who actually does the enforcing. Where the local or national government is unable or unwilling to enforce the community's rights, then the community must have the ability to do so. For example, the Philippine Coast Guard may never have the funding needed to adequately monitor all 18,000 kilometers of coastline, even if it wanted to. The Bantay Dagat volunteers are critical to ensure that communities feel their rights are enforced. In Barbados in the Caribbean, on the other hand, the government effectively enforces fisheries regulations that were developed through a community-based process (McConney, 1998). Here, too, the communities feel their rights are enforced and thus have an incentive to use the resource sustainably. In contrast, the Jamaican government is responsible for enforcing fishing and pollution regulations, but is mostly ineffective. As a consequence, over-fishing continues, and pollution is destroying the reefs and beaches that support the local tourist economy.

Having communities work with local authorities to enforce their property rights has additional benefits:

- *Lowers the government's enforcement costs* — as communities monitor and enforce how they and others use resources, government agencies can lower their enforcement budgets or expand enforcement elsewhere;
- *Provides the opportunity to use social values to enforce sustainable resource use* — communities can enforce regulations through the expectation of reciprocal relationships, social expectations, and the intimate knowledge of each other, (Baland and Platteau, 1996), as is happening in Northern Thailand (Jantakad and Carson, 1998);

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- *Decreases opportunities for corruption and political expediency to contribute to the unsustainable use of the resources* — with communities managing resources and helping to enforce regulations, it is harder for politicians and government agents to appropriate the resource for their own short-term gain (Baland and Plateau, 1996);
- *Strengthens the community's willingness to preserve the resource* — a community that actively enforces rules to use a resource sustainably is much more likely to implement sustainable practices (Cialdini, 1984; Zimbardo and Leippe, 1991); and
- *Increases understanding and concern by government agencies and politicians of the needs and conditions of local communities* — as enforcement and legal agencies and politicians regularly work with communities to plan and enforce resource use, they develop a better understanding of the abilities and needs of the communities. This can significantly affect how these officials see their role in representing and serving the communities, and can greatly increase the trust between communities and officials.

CBRM programs may need to develop the technical and managerial skills of local and national authorities to support community efforts to enforce their rights; authorities may need to help communities negotiate or arbitrate disagreements over boundaries and regulations, apprehend and prosecute violators, etc. However, CBRM must begin with at least some political support for local decision making (Christie and White, 1997; Courtney and White, 1999). Political support is also critical for local governments to change their role from merely enforcing access to resources to mediating among conflicting claims to resources (Wells and Brandon, 1993).

CBRM programs may need to ensure that the rights of different groups within the community are also enforced. Women in particular may face additional difficulties in enforcing rights to resources they use. In many countries they have no legal right to own land, or some men do not allow them to control resources. In Zimbabwe, Burkina Faso, and Cameroon, women can legally own land, but custom prohibits many rural women from owning the land they farm. In Cameroon, some men allow women to plant only short-lived trees, such as papaya, to prevent women from gaining land tenure (Mehra, 1995).

To help women or other marginalized groups enforce their resource rights is a straightforward objective for CBRM programs. However, achieving this can require consistent effort with many groups to change behaviors and overcome resistance. Local authorities may be more reluctant to enforce women's rights than to enforce men's. In India, some local governments "simply do not enforce women's land rights" (Mehra, 1995, p. 36); in Zimbabwe the Supreme Court recently ruled that women are inferior to men and have no legal right to inheritance, despite 20 years of constitutional protection of this right (*Dallas Morning News*, April 1999). Where local authorities are reluctant to or are unaware of the need to enforce women's resource rights, the CBRM program can include local authorities, judges, and lawyers in this effort. The programs may also need to help national policymakers change regulations or laws that prevent women from controlling their resources to the same degree that men can (e.g., laws that prohibit women from owning or inheriting land). Indigenous and poor communities may also face many of these constraints.

Many CBRM programs increase men's control of resources but not women's. A program in Cogtong Bay, Philippines, for example, involved the community in restoring mangrove forests. The men involved in the program received 25-year leases to mangrove areas. Women worked to plant and tend mangroves, attended association meetings, became association officers, helped make decisions, and adopted new mariculture techniques which the program introduced. Yet women were excluded from formal membership in the associations and received no leases of mangrove, which prevented their access to credit, which they wanted (Mehra et al., 1993). One step to avoid such inequities is to register benefits in the names of the men and the

women participants, not just in the name of the male head of household; other options will depend on the country's legal system. At the least, CBRM programs must offer women the same access to resources and program benefits as men for the same involvement in the program.

Conflict often arises as women or other marginalized groups begin to enforce their resource rights. The most effective CBRM programs anticipate this conflict and commit the time and resources to help communities resolve this issue. Some community-based programs have overcome men's resistance to enforcing women's rights through public discussions with men and women about how men's behavior affects women and the community (Oxfam, 1995). In some communities, CBRM programs may be able to draw support from local officials to mediate these conflicts. Programs can also support women's groups to advocate enforcing women's resource rights.

### *Prevent Others From Abrogating Resource Rights*

If a community believes that an individual, firm, or the government may abrogate or rescind its right to use a resource, it is less likely to preserve the resource for future use (Panayotou, 1993). For example, people's perception of the government strongly affects how communities manage forests in Guatemala and Mexico. Communities in the Maya Biosphere in Guatemala are receiving community-based forestry concessions. The communities are improving their income and managing the forests better, but they believe the government may rescind their concessions. In the Quintana Roo area of Mexico, communities are much more sure of their land tenure. As a result, it is much easier to plan forest management with the Quintana Roo communities than with those in the Guatemalan Maya Biosphere (Gretzinger, 1998). Another example is the Amboseli Game Reserve in Kenya. In 1977, the Maasai vacated the Amboseli and agreed to limit their use of wildlife in exchange, in part, for title to other livestock grazing land, part of the proceeds that the Amboseli wildlife generated, and new wells for livestock water. Initially, the wildlife began to recover. In 1982, the government unilaterally stopped the payments to the Maasai and stopped maintaining the wells. As a result, the Maasai resumed spearing wildlife and grazing livestock in the reserve (Metcalf, 1994).

How government agencies implement CBRM programs can also cause a community to be uncertain that it will benefit from resource rights. In Madhya Pradesh, India, frequent transfers of and varying degrees of support among forest officers for the CBRM effort undermine the success of community-based forestry programs (Kant and Cooke, 1998). CBRM programs can help national and local governments provide clear, long-term, public commitments to recognize and support community resource rights and CBRM efforts.

Different groups within a community may be less secure in their resource rights than other groups. For example, in many places, women obtain their use rights through men, or men can take resources that women have the right to use (Mehra, 1995). In these systems, women's resource rights are not particularly secure. In Zaire, the civil code assumes that a woman's husband will manage her property and may sell it if he wishes (Clones, 1992). As of 1994 in Zimbabwe, women had no right to communal land, only 23 percent of women had the right to use lands belonging to their husbands, and widows had no inheritance rights. As a result, "women 'feel insecure' and 'have no incentive to make investments' because such investments would yield benefits for the husband or male children and not for themselves" (Mehra, 1995, p. 12).

Tenure reform also tends to increase and formalize men's land security, "while decreasing and 'informalizing' women's rights of ownership and use rights" (Rocheleau, 1988, p. 256) (though tenure reform has increased women's as well as men's land rights in some countries, including Mexico, Nicaragua, Ghana, and Nigeria

[Rocheleau, 1988]). One common cause is registering new, formal land titles in the name of the male head of household, or denying title to single or widowed women. Where tenure reform makes women's resource rights less secure, the reform can actually decrease women's incentives to use their land sustainably. CBRM programs can work with governments and local officials to ensure that all community members feel their resource rights are equally secure. The objective is to ensure that the entire community — women, men, poor, indigenous people, etc. — has every incentive to maintain resources and use them sustainably.

### **Provide Information and Skills Needed to Use Resources Sustainably**

Even if communities do control resources, they may need extensive help to identify and implement more sustainable ways to manage them. In Nepal, the CBRM program helped herders in the Annapurna Conservation Area understand how livestock grazing in forests prevented trees from regenerating. The herders are now increasingly using pen feeding to better manage the forests (Wells, 1994). In Costa Rica, individuals had to be organized into communities before they could effectively manage their resources (Donovan, 1994). In South American neotropical forests, nongovernmental organizations (NGOs) and governments are working together to help indigenous peoples learn how to manage wildlife to support sustainable hunting (Robinson and Redford, 1994). In all of these cases, new information was needed for resource users to see alternative ways to use their resources. In a World Wildlife Fund (WWF) survey of marine conservation programs, 95 percent of respondents reported that training and awareness building make a difference in how resources are used (Wilcox, 1994). A key role for CBRM programs is to help communities identify sustainable alternatives for using their resources, the consequences of their choices, and how to implement new resource uses.

New information will be most useful if CBRM programs provide it directly to the people who will use it. General information is typically intended to build a constituency that can make informed choices to use resources sustainably. To be most effective, CBRM programs need to ensure that this general information reaches all members of a community — men, women, rich, and poor. Other kinds of information will be targeted to help specific groups in a community change how they use resources — new fishing methods for fishers, erosion control techniques for farmers, etc. Providing this information to everyone who could use it will maximize the number of people who are able to use resources more sustainably. Thus, CBRM programs need to reach all members of each target group; for example, all farmers, both men and women, need information about new seeds and soil conservation methods.

This conclusion is rather obvious, yet many CBRM programs still provide men with the information they need to use resources better, but do not provide information to women. For example, a program in Bangladesh to encourage farmers to plant and maintain trees around homes and farms trained only men in agroforestry. Yet women are involved in every aspect of farming except land preparation, and women are responsible for caring for tree seedlings and trees around the home (Wilde and Vainio-Mattila, 1995). To be most effective, the program needed to train the women as well as the men.

Where men and women use different resources or have different roles in using resources, they need and can use different information. Programs that do not recognize this are unlikely to provide women with the information they need. Some programs provide information to men and assume they will pass the information on to the women. For example, in 1998, NGOs training Lebanon communities in new agricultural techniques and plants were training the men, but not the women. Although women were responsible for half the planting and weeding and all of the harvesting, the men were taught these techniques. The NGOs

assumed the men would then teach the women. This rarely happens, and is also very inefficient. The only effective way to inform the women is to explicitly include them in training and discussions.

Increasing the chance that both men and women will receive future benefits from resources will greatly increase the likelihood that they will manage the resources sustainably. As described above, CBRM programs can increase this likelihood by ensuring that the community has the information, skills, equipment, and backing needed to enforce its rights to the resource. CBRM programs will probably also need to ensure that national policies, local government, and the judiciary support community efforts to manage resources sustainably. To be most effective, CBRM programs can ensure that women participate in resource management decisions and can enforce their user rights to the same extent as men's.

### ***Increase Benefit Value***

To encourage the sustainable use of resources, the relative value of *future* benefits must increase. If the value of current benefits increases relative to future benefits, users will have an incentive to mine the resource immediately. This incentive is exacerbated if users strongly prefer current benefits over future benefits, (this time-preference problem is addressed more in the later section on Increasing Preference for Future Benefits.) Thus, CBRM programs need to increase future as well as current benefits from resources.

Benefits from resources come from the goods and services the resource provides. Thus there are really only four ways to increase the value of benefits from a resource:

- Increase the market price for, or the social/cultural value of, the goods and services;
- Market more of the currently used goods and services;
- Market new goods or services from the resource; or
- Decrease the costs of obtaining and marketing the goods and services.

As stated previously, this paper focuses on the economic value that people feel they receive from a resource. Thus, the following discussion focuses on how to increase people's perceived economic value of a resource, not the social value (Figure 3).

### **Increase Market Price and Market More or New Goods and Services**

#### ***Link Benefits to the Resources***

The ability to explicitly link benefits to the resource is probably one of the most powerful tools CBRM has to encourage the sustainable use of resources. The more that people attribute benefits to a resource, the more likely they are to preserve the resource to enjoy those benefits in the future. The first generation of CBRM projects typically provided income and compensation that were not linked to the natural resources. As a consequence, and because they tended to have little community input, they did not greatly affect how communities used natural resources (Larson et

al., 1998). Every successful CBRM program found in the literature reviewed links the benefits that the community enjoys to the natural resource.

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Some systems accomplish this by assigning to communities a share of income that is generated from some aspect of the resource. Under Zimbabwe's CAMPFIRE program, revenue derived from wildlife that used to go to the national Treasury is now controlled by districts. Some districts distribute the revenue as cash to each household, based on the amount of wildlife in the area of their village. As a consequence, many of these villages now see wildlife as economically beneficial, "a resource to be nurtured rather than eliminated" (Metcalf, 1994, p. 180). In Chikwarakwara village, Zimbabwe, villagers included wildlife management in their land use plan after they received \$200 per household from the government wildlife management fees (Metcalf, 1994).

In other cases, communities may not recognize that a particular good or service of their resource has value that does or can benefit them. A CBRM program can help them to understand these links and to consider previously unrecognized benefits in deciding how to manage resources. For example, a survey by the American University of Beirut (AUB) showed that few rural people in Lebanon know that trees help prevent soil erosion and maintain water resources, two key concerns to rural communities in this arid country (unpublished AUB report, 1998). Thus, NGOs in Lebanon have been conducting awareness campaigns to inform people about the benefits of trees. As a result, communities are starting tree planting programs. In Brazil, Woods Hole Research Center staff inventoried the forest resources that eastern Amazonian communities used. The research staff then used market information to help the communities explicitly recognize how these non-timber resources contributed to household income. This process gave the communities a different understanding of how they benefited from the intact forest. This was a key step that led the communities to conserve part of their forest for harvesting fruits, and to limit the area and intensity of logging (Shanley, 1999a).

Knowing how others value their resources can also allow communities to identify ways to capture some of that value, thereby increasing the total value of the resources to the community. In Mexico, younger members of cloud forest communities are working to convince elders that tourists would pay to see masses of migrating Monarch butterflies. The younger people believe that the resulting tourism would be more valuable than continuing to sell lumbering concessions (*Washington Post*, 1999). In South Africa, urban residents in Umgeni pay a fee on their water bill that in part helps upland farmers better manage the watershed to ensure downstream water supplies (Pillay, 1999).

CBRM may also be able to help communities recognize that a good or service that they value is endangered. Many communities understand how they benefit from their resources, but may be unaware that the way they use their resources threatens the community, or what to do about that. CBRM can provide technical input to help communities understand these threats and design plans to manage resources sustainably. For example, the Annapurna Conservation Area Project in Nepal convinced trekking lodges and others in the tourism trade to use only kerosene for energy needs of visitors. This greatly decreased the rate of deforestation in the area. They also established tree nurseries and worked with farmers to decrease grazing in forests to allow tree regeneration (Wells, 1994).

When linking resources to value, it is essential to explicitly identify the resources that women use as well as those that men use. Often only men are interviewed to determine how a community uses a natural resource. In these cases, aspects of the resource value to half the community (women) are not considered. As a result, the resource may be greatly undervalued. For example, in some villages in Gujarat, India, men decided to forbid any further cutting of trees in the village forest to allow it to recover from over-harvesting of timber. However, their plans failed to consider that women used the standing trees to provide firewood. The women actively resisted the management plan, and it was less effective than it could have been if it had initially

considered how women used the forest (Sarin, 1998). CBRM programs will be more effective if they identify and help communities recognize the value of the resources that both men and women use.

*Increase the Market Price Received for Renewable Goods or Services From the Resource*

One of the most direct ways to increase the value of a resource to a community is to increase how much they are paid for the goods and services the resource provides. Some ways to accomplish this are:

- *Form cooperatives or committees to negotiate better prices for products*— villages in Madhya Pradesh, India, organized such committees under the national Joint Forest Management program and now receive higher prices for their non-timber forest products (Kant and Cooke, 1998);
- *Eliminate the middleman in marketing*— some Mexican ejidos (Galletti, 1998) and Philippine communities have done so in selling timber; some coastal Philippine communities have done so to sell cyanide-free live fish for the aquarium trade (Barber and Pratt, 1998). These communities have significantly increased their income as a result.
- *Process the product more before marketing* — chicle cooperatives in Quintana Roo increased their income by adopting new processing methods that increased output by 30 percent and eliminated contaminants to produce a better quality product (Galletti, 1998); and
- *Pool resources to store part of the product for sale in the off season* — the Forest Protection Committee in Kundwara, Madhya Pradesh, India, buys and stores *mahua* flowers to sell in the off season at a higher price. The profits go to a general fund which the entire community decides how to use (Kant and Cooke, 1998).

Men and women generally have different roles in harvesting and marketing resources. Programs that identify these different roles, uses, and knowledge will maximize the opportunities to increase resource revenues. For example, the Rainforest Alliance helps women in and near Oeiras, Brazil, market fruit and medicinal plants from the forest. The women's income has increased, and they have led workshops on forest value and marketing fruit and medicinal plants in nearby communities. As a result, at least two communities have established forest reserves to preserve the fruit trees and medicinal plants (Shanley, 1999b). Some programs, however, miss opportunities because of preconceived ideas of men's and women's roles. In Bolivia, part of an integrated development program was to increase the productivity of alpaca and llama wool. When the program managers found that women herd and shear the alpaca and llama, they assigned that aspect of the program to the state welfare agency rather than to the Ministry of Agriculture. Instead of learning improved herding and shearing technology, the women were trained in home care skills such as knitting, cooking, and embroidery (Mehra, 1997). CBRM programs that help women, as well as men, market goods and services will likely identify many more ways to increase the value of resources to a community.

*Remove Restrictions on How Communities Can Market the Goods and Services*

Many countries regulate how a community can use or market its resources. Some of these regulations contribute to the sustainable use of a resource — for example, the Philippines' Department of Natural Resources (DENR) must approve a community's plan to manage a community forest. The DENR provides technical support to the community to design and implement the plan and monitors compliance.

However, many regulations create incentives to use a resource unsustainably, or hinder community efforts to manage a resource well. For example, in the early stages of the Philippines' community-based forest management program, the DENR required some participating communities to sell harvested timber to buyers within the same province. The purpose was to ensure a timber supply for mills in the province, where jobs were needed. However, this established a monopoly for the buyers. They set the price for timber in the province below the market price, then sold the milled lumber in Manila for export. When this restriction was lifted, communities were able to obtain higher prices for the timber by selling it in Manila. The higher price made the forest more valuable to the communities. This contributed to many villages in the CBRM program investing in reforestation and preventing slash-and-burn farming within the community forest (B. Harker, personal communication, 1997).

Other possible restrictions include: import restrictions that limit access to capital goods; complicated and time-consuming licensing requirements; inadequate roads to deliver goods to markets or access fields; and lack of knowledge about how or where to market goods. CBRM programs may need to work with national policymakers to revise restrictive policies; others will require developing capital investment or skills of local agencies.

Some restrictions may apply to men and women differently. In many places, women may face additional restrictions that need to be addressed. For example, female vendors in parts of India are harassed by police (Mehra, 1997). When identifying the restrictions that communities face in marketing goods, CBRM programs can improve their success by determining if women and men face different constraints.

### *Create Markets for Previously Unmarketed, Under-Priced, or New Goods or Services*

Many resources provide goods or services that are not marketed, such as fruit, scenery, or the ability of a watershed to store water for a downstream city. The tangible value of a resource to a community will increase if the community can market these goods and services. For example, a seahorse sanctuary that a Philippine community created under the USAID/Philippines Coastal Zone Management program has started to draw scuba divers. The community is marketing access to the seahorse breeding grounds, creating tourism where none existed.

Communities can also identify new market niches for goods, such as selling organically grown coffee, or wood certified as "sustainably harvested" under a green label. NGOs in Lebanon are helping farmers establish markets in Beirut for organically grown produce; several ejidos in Quintana Roo obtained a "green seal" certification for sustainably managing their timber, and sell their timber at a higher price to green markets in Europe and the United States (Galletti, 1998). In Indonesia and the Philippines, the International Marinelifelife Alliance (IMA) is training cyanide and dynamite fishers how to grow coral for the aquarium trade, creating a new product that can be produced without harming the resource (Vaughn Pratt, personal communication, 1997).

As previously noted, programs that identify the goods and services that both women and men use are more likely to find new products to market. This generally requires that field workers specifically ask women how they use the resource.

As communities begin to manage resources, they may compete with established companies. In many places, these companies have operated as the sole buyer of goods from a resource. Where a community can only sell to one buyer, the buyer tends to pay a low price for access to the resources. Communities are likely to get a much higher price for their products if a number of buyers are competing for them. For example, in Quintana Roo, Mexico, chicle and tropical hardwoods sales were both monopolized before the ejidos formed cooperatives. The community cooperatives have increased their income several fold by finding alternative buyers for their chicle and timber. This has greatly increased the value of the forest to the communities (Galletti, 1998). In Bunche, Ecuador, the Coastal Resources Management Program nearly tripled the income of women cockle collectors by establishing competition for the sole cockle buyer (Bravo, 1996).

Existing firms are likely to resist the changes that result from introducing competition. Communities will need support to overcome this resistance. For example, local timber producers in Quintana Roo tried to have the government require the ejido timber cooperatives to sell their timber to the former monopoly buyers. The ejidos successfully thwarted these efforts (Galletti, 1998), in part by appealing to higher political authorities. Political support is often needed to overcome this resistance to change — another reason for CBRM programs to build support at the local and national government levels.

### **Lower the Costs of Obtaining and Marketing the Goods and Services**

#### *Lower the Cost of Capital Needed to Harvest Goods or Access Services*

Some uses of resources require equipment or buildings to maximize the benefits of the resource. Lowering the cost of this capital to a community can increase the value of its resources to it. For example, small chicle harvesters in Quintana Roo combined their resources through community cooperatives to build centralized production facilities with improved technology. They increased their income so much that chicle replaced mahogany as the most valuable forest product (Galletti, 1998). With USAID funding, NGOs are helping communities in the Yammouneh area of Lebanon build cold-storage facilities together to store crops to sell in the off season at higher prices. In each case, communities are pooling resources to obtain facilities they could not individually afford, and to increase their income.

The lack of capital may be particularly important for communities that seek to use their resources for ecotourism. On Apo Island in the Philippines, island inhabitants receive more income from tourists to their fish sanctuary since a small resort was built on the island by an outsider and staffed by island residents. However, in the WWF survey of marine conservation programs, none of the 47 respondents reported that locally based ecotourism was successfully competing with commercial interests (the Apo island resort has no competition). They determined that this was in part because locally based facilities offer less infrastructure (Wilcox, 1994). CBRM programs can help these locally based efforts compete better by finding ways to lower the cost of improving their facilities.

There are at least five ways CBRM programs can help communities lower capital costs:

- Identify or develop a new technology to improve or lower the cost of production, processing, or marketing;
- Obtain credit at a low cost to buy the equipment needed;

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- Locate a low-cost source for capital goods;
- Link many households or communities to pool their resources and lower the per-household/community cost; and
- Train the community in how to use their new investment, such as a mill or a tourist facility.

In most developing countries, men and women have access to different kinds of capital. CBRM programs need to explicitly determine if this is the case in the program area, and what effect it would have on the outcome of the program. If men and women face different constraints to accessing capital, and if these differences could affect the outcome of the program, the program should address these constraints directly. In the Gambia, for example, women are the main rice producers on swamp land. Yet, when a development project provided irrigation, 87 percent of the improved land was registered to men, and only 10 percent to women (Mehra, 1995); most of the rice producers, women, received no irrigation support from the project. At the least, CBRM programs need to ensure that women have equitable access to capital improvements that the program introduces. CBRM programs can also ensure that women participate in such benefits as credit programs, training, and land tenure efforts in at least the proportion that they use the resources being managed.

### *Lower the Time-Cost to Acquire the Goods or Services*

The time people use to collect timber, fish, reeds, etc. could be used for other purposes, and thus has a cost. In many communities, different technology could decrease the time it takes for people to collect, process, or market goods. For example, in the South Pacific, IMA is teaching dynamite and cyanide fishers a technique to keep large groupers that are caught on hook and line alive. Previously, the fishers had to spend hours using cyanide to catch live fish in shallow water. The new technology allows them to spend considerably less time to catch fewer, larger fish from greater depth, and still increase their income. This new technology has convinced the fishers to stop destructive fishing methods and use the reefs sustainably, in part because it saves so much time (V. Pratt, personal communication, 1997). The USAID/Philippines community-based forestry program worked with the DENR to remove the requirement that communities use horses and not tractors in their logging operations. Using tractors greatly decreases the community's labor costs to haul logs to the mill, and increases the value of the forest to the community.

To lower the time-costs for communities to use their resources, CBRM programs can:

- Train communities in more modern technology to process or harvest the resource, such as improved lumber mills, different fishing methods, hybrid seeds, etc.;
- Decrease the time needed to take products to market, such as getting local governments to build or improve a road, help the community acquire a truck, etc.;
- Help communities organize themselves to harvest resources efficiently; and
- Work with government agencies to revise regulations that impose time-costs.

Because men and women typically have different roles in using and marketing resources, programs that lower the time-cost for men may overlook opportunities to lower women's costs. These are missed opportunities to increase the value of a resource and the potential to use it more sustainably. Given that women in most countries work more hours in a day than men, it is particularly important to lower the time-cost for women of using a resource. For example, villages in Gujarat, India, designed forest management plans that caused women to travel much farther to collect firewood. This greatly increased the time to collect wood,

and exposed the women to humiliation from neighboring villages. These increased costs to women caused them to work against the management plan (Sarin, 1998). CBRM programs can help lower time-costs for all resource users; CBRM should at least not increase time-costs to any segment of the community, such as women or the poor.

*Lower Transaction Costs to Market Goods and Services*

The activities involved in using resources — harvesting, processing, transporting, marketing, recording, etc. — take time and require logistical organizing. Many require dealing with intermediaries or regulators. Each of these interactions and activities bears a transaction cost in time and convenience. These transaction costs can dissuade people from using or preserving some aspects of a resource. CBRM can lower these transaction costs and can spread the costs among more people. This will increase the value of the resources to each community member. For instance, in Ilengwesi, Kenya, communities pooled their resources to afford marketing and training and to provide enough guards to effectively patrol for poachers (D. Western, presentation, 1999). Any village alone would likely not have been able to afford these steps, and would not have been able to build tourism as well as the cooperative of villages can. In the Eastern Caribbean, organizations of fishers are trying to agree on how to manage pelagic fish stocks. The cost and difficulty of regular contact among the island groups is making this effort difficult. But “without a viable regional fisherfolk organization, reaching scientific and political agreement on the management of shared resources would be very difficult” (McConney, 1998).

Some of the ways that CBRM programs can help communities overcome these transaction costs are:

- Work with communities to improve their land management planning to minimize negative impacts between community activities and maximize the total benefits from resources — ideally, help communities use integrated water resource management and other integrated planning methods;
- Work with community leaders to improve their ability to negotiate and resolve conflict over access and use of resources;
- Inform communities of their rights and how to obtain information about using government services, such as titling, permitting, and extension services;
- Work with government agencies to simplify interactions with them, such as titling, business permits, obtaining sales licenses, etc.; and
- Help neighboring communities work together to manage resources that they share.

In many places, women face different transaction costs than men for the same activity. For example, women may not be able to irrigate their fields if their allotted irrigation time coincides with other responsibilities such as cooking or child care. Or, women may face ridicule or attack if they attend meetings at night or far from home. By identifying which activities men and women do, and social gender constraints, programs can identify which transaction costs to help both women and men lower. CBRM programs that ignore these differences generally improve men’s activities or participation, but not women’s, missing an opportunity to further raise the value of the resource to the community.

Two significant costs that men impose on women in many places are harassment and domestic violence — particularly onerous transaction costs. It is not uncommon for women to be harassed or beaten as they become involved in managing natural resources. Harassment is a constraint in programs worldwide (Johnson et al., 1996; Mehra, 1997). In Brazil, women have been threatened and killed for participating in local

decision-making (Shanley, 1999b). Violence limits women's willingness to participate in managing resources, and thus limits how effective CBRM efforts can be. As CBRM programs increase women's participation in decision-making, they may need to help communities address this constraint of men's violence against women. An effective approach is to discuss the problem publicly. Oxfam used this approach to overcome violence against women that was limiting a microenterprise program in Bangladesh. They decreased domestic violence and built men's support of women's activities by engaging men and women in discussing the effects of violence on families and including men in the project (Oxfam, 1995). In a Philippine coastal management program of the NGO Tambuyog, a number of village women were reluctant to participate because their husbands beat them when they did. After working with the villagers for months and earning their trust, Tambuyog staff were able to lead discussions with the villagers about this problem. They were able to help the men to recognize that they felt threatened by the women's participation and to accept that women's participation did not diminish the men's status (B. Rivera, personal communication, 1997).

### *Provide Information Communities Need to Benefit From Their Resources*

Perhaps the most critical transaction cost to communities is access to information. As noted previously, CBRM programs can ensure that communities have the information they need to make informed choices about how to use their resources. Informed community members are also necessary, though not sufficient, to prevent a minority, such as local elites, from dominating a CBRM process for their own gain (Larson et al., 1998). Communities may need information about technical options for using resources, market information, how to access government services, how to organize and run committees and network with other villages, technical information about the ramifications of various use options, etc. Communities may also need assistance to better understand what goods and services their resources provide from which they could benefit, and how to maximize that benefit sustainably. For example, forest communities along the Capim River in Brazil had little experience selling non-timber forest products. Woods Hole Research Center staff, with funding from USAID, helped the communities conduct production/yield studies of fruit species. The staff provided information on the economic value of the fruit, fiber, game, and standing timber. This information on the value of intact forest enabled the community to negotiate higher concession rates with logging firms and to prevent the extraction of locally valued fruit trees (Shanley, 1999b). The NGO also helped the village women organize the logistics of transporting and marketing the non-timber forest products downstream. The increased income from these non-timber forest products convinced the village to establish forest reserves to preserve the fruit trees and ensure sustainable timber harvests (Shanley et al., 1997). Coastal-zone management programs in Indonesia and the Philippines help communities understand the relationship of mangrove forests to fisheries. As a consequence, many coastal communities are beginning to preserve mangrove forests.

To reach all community members with information, programs will need to consider how to most effectively inform different groups in the community. In many developing areas, men and women get information through different sources and at different times of the day. The most effective CBRM programs incorporate these differences in their outreach programs to ensure that both men and women have access to the information they need to make informed decisions. For example, the Philippine community forestry program targets radio messages to men and women on different stations at different times of day, to fit men's and women's preferences (B. Harker, personal communication, 1997).

*Increase the Costs of Not Using a Resource Sustainably*

As the costs of using a resource unsustainably increase, the expected benefits from doing so decrease, and the relative benefits of sustainable uses increase. Thus, raising the cost of using resources unsustainably provides strong incentives for people to adopt more sustainable methods of using the resource. There are two ways to increase the cost of using resources unsustainably:

- Ensure that people who use a resource unsustainably bear all the cost of doing so — if the logger bears the costs of the resulting soil erosion, he is more likely to consider these costs in deciding how and where to cut trees;
- Impose additional costs for specific, unsustainable uses — fines for illegal logging, confiscating equipment such as fishing boats from illegal fishers, and public disclosure of violators' names are all effective.

Some ways to increase the cost of using resources unsustainably:

- *Eliminate government policies that provide incentives to use resources unsustainably:* Many local actions are the result of national-level policies. For example, many countries in Central and South America and Southeast Asia have or do confer land rights to forest settlers only if they clear the land. In Costa Rica, the government recognizes some land right if farmers clear and then reforest the land, but not if they preserve primary forest (Donovan, 1994). In Indonesia, such policies have led to forest communities denuding their land to maintain control of it (Baland and Platteau, 1996). Government subsidies for unsustainable uses of resources are particularly onerous policies that need to be changed (Panayotou, 1993) — Brazil only recently removed tax support to farmers who cleared rain forest to raise cattle.

The first priority under the prevailing circumstances in developing countries is to eliminate policies that have significant environmental cost or which create perverse incentives that encourage the depletion of resources and environmental degradation beyond the free-market level. Reforming policies that distort incentives for efficient resource use is a priority because unless perverse incentives are removed, project investments aiming at improved utilization and conservation of resources are unlikely to succeed and when they do, their impact would be unsustainable, lasting only as long as the project lasts (Panayotou, 1991, p. 90).

Changing policies that encourage unsustainable resource use generally requires working with national-level policymakers. For this reason, many CBRM programs recognize the need to work simultaneously at the local and national levels (Christie and White, 1997). Thus, the USAID/Philippines Coastal Zone and community forest management programs work with national agencies and legislators to institutionalize laws and regulations needed to support community management of resources.

- *Improve enforcement of regulations and community plans for sustainable uses:* Whether market-based incentives or command-and-control approaches are used to encourage the sustainable use of resources, someone has to enforce the rules. Communities in the Philippine community-based forestry management program effectively prevent slash-and-burn farming in their forests. The rate of forest fires in the Philippines has dramatically dropped as a result (B. Harker, personal communication, 1997). Villages in the Kundwara area of India impose fines for illegal cutting of forests. The proceeds from the fines are used for community projects and to fund the government Forest Department (Kant and Cooke, 1998).

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Many communities and government agencies need assistance to more effectively enforce regulations. This effort may also require training the judiciary and lawyers about the needs of and ways to support effective enforcement. This has been key in the Bantay Dagat program of coastal watchers in the Philippines.

Effective enforcement also requires effective monitoring. National agencies and communities both have a role to play in effectively monitoring resource use. CBRM programs can help national agencies improve their technical ability to collect and analyze biophysical data, and to support community planning and management. Involving communities in monitoring their own use of resources is a powerful tool to educate community members about the consequences of how they use their resources. In the Philippines, community members walk through the forest periodically to monitor the state of the forests being managed under the community-based forestry program. The community members determine for themselves how their management efforts are improving the forest, which reinforces their commitment to manage the forest sustainably (B. Harker, personal communication, 1997).

- *Publicly disclose names of people or firms which practice unsustainable uses:* As communities recognize how sustainable uses benefit them and that unsustainable uses harm everyone, public opinion can be an effective tool to pressure individuals and firms to stop harmful practices. Many countries, including Indonesia, the Philippines, Mexico, India, and the United States, use this approach to encourage firms to stop polluting.
- *Increase the cost and/or decrease the availability of equipment needed to practice harmful resource uses:* Raising the direct costs of using resources unsustainably is one of the most effective ways to decrease the incentive to do so. For example, the IMA has been instrumental in decreasing the availability and raising the cost of cyanide to fishers in the Philippines. This has made it much more difficult and expensive to practice cyanide fishing and makes sustainable fishing methods more attractive (V. Pratt, personal communication, 1997).
- *Institute market-based incentives to discourage unsustainable resource use:* Market-based incentives are regulatory mechanisms that use economic incentives to increase the cost of specific actions that are not sustainable, or decrease the cost of ones that society prefers. Market-based incentives include such mechanisms as exclusive, long-term rights to harvest from specified areas of coast line or forests, wastewater discharge fees, emissions permits, tax incentives, etc. CBRM is a form of market-based incentive. For example, communities in the CAMPFIRE program are paid wildlife proceeds according to the density of wildlife in their area. As a result, communities are discussing how to manage pressures of increasing human population on wildlife, which could decrease their wildlife proceeds (Metcalf, 1994).

The incentive for a community to preserve a resource to ensure future benefits will increase as the value of those future benefits increases. The factors listed above can help CBRM programs identify how communities can increase the future benefits from their resources. Each of these factors is likely to affect men and women differently. Programs that explicitly address these gender differences will maximize the benefits to communities.

## INCREASING PREFERENCE FOR FUTURE BENEFITS

Even if people *can* benefit from using a resource in the future, they may *prefer* to benefit from using the resource now. People will only intentionally use resources sustainably if they *want* the future benefits at least

as much as they *want* the benefits today. How strongly people want current or future benefits is called their time preference.

Time preference is different than the likelihood of receiving future benefits. A poor fisher may be absolutely certain he could catch fish from a particular reef next year if he used hook and line rather than dynamite — the likelihood of next year's catch may be close to 100 percent. But he may not want to wait a year to catch the rest of the fish — he may strongly prefer to have the fish this year, and so he uses dynamite to maximize his current catch.

Three key ways that CBRM can help people want the future benefits of resources more are:

- help them meet their basic needs of today;
- increase their sense of control over their lives;
- ensure they have access to credit at commercial interest rates (Figure 4).

### ***Meet Basic Needs***

A common concern in the development community is that people eking out a subsistence living are so desperate to meet current needs that they cannot afford to preserve resources for future use. This may be the case in some places, but not everywhere. People at all levels of income are coming to realize that managing resources to ensure future income is a necessity, not a luxury for the wealthy (Uphoff, 1998). As described earlier in this paper, poor people around the world are choosing to forgo current gains for future benefits that are certain. However, it is still more difficult to value future benefits if one's needs are not met today. People are far more likely to value what they can get from a resource next year if they are not struggling to protect, feed, and house themselves and their families today. Thus, CBRM programs can increase people's preference for future benefits by helping them meet their immediate needs.

Many CBRM programs include activities to increase the income of community members to better enable them to meet their basic needs. Many programs develop different kinds of alternative employment for men and women, seeking to build on the different skills and options that men and women have. Unfortunately, many of the alternatives identified to help women are lower-paying than those developed for men. For example, in the Philippine community forestry program, some of the highest-paying jobs are in logging and the community sawmills. These jobs are typically given only to men. Many CBRM programs offer women training in traditionally female activities like knitting, sewing, making preserves, basket weaving, and other crafts. Many of these programs have limited potential to generate more than subsistence income, and do not take into account women's previous experience in small trades, farming, and services. Many programs also do not consider whether the products the women produce can be sold, or if the skills they are taught will help them get a job (Mehra, 1997). CBRM programs can more carefully consider what productive skills women can use and should research local markets more when designing income-generation activities for both women and men.

### ***Increase People's Control of Their Lives***

A fundamental aspect of CBRM is that it increases how much control people have over their own lives by enabling them to make more of the decisions that affect them. Gaining, or regaining in some instances,

control over resources on which they depend allows people to make fundamental decisions about their own future. When people control the decisions that affect their lives more, they are more likely to consider how their actions affect their own future and to plan for the future. Thus, as communities gain control of the resources they use, they are likely to begin to consider the future implications of how they use their resources. Also,

research demonstrated that increased involvement and participation were desired by most people, had the ability to energize greater performance, produced better solutions to problems, and greatly enhanced acceptance of decisions. It was found that such group dynamics worked to overcome resistance to change, increased commitment to the organization, reduced stress levels, and generally made people feel better about themselves and their worlds. Participation is a powerful elixir — it is good for people... (French and Bell, 1995, p. 94).

Numerous studies have shown that community participation is far more effective when the community is involved in each stage of the process, from identifying which problems to address, to monitoring the results (IIED, 1994; Narayan, 1995; Little, 1994; Larson et al., 1998). Participating means taking part in decisions at each step of resource management.

It is fine for outsiders to identify conservation problems. But it is critical that the CBRM program staff work closely with the people using the resource "...to incorporate their concerns and communicate the problem in meaningful local terms" (Little, 1994, p. 360). The role of the technical staff in this process is to help the community understand its resources, the implications of how it uses them, and the ramifications of various options. But the decisions must come from within the community. In this process, it is critical to involve all the resource users. "As a first step, community-based conservation programs should start with a simple model of who the major interest groups are: their current resource-use motives and whether these conflict with those of other groups; their behavior and its effects on resource use and conservation; and the potential winners and losers as a result of a conservation program" (Little, 1994, p. 357).

Just involving people at each stage is not enough, however. Involving the community in the design phase may not ensure a successful project if the community does not agree on priorities and problems. People who feel that a management plan does not serve their interests will have incentives to ignore or obstruct the plan. For example, the Korup project in Cameroon sought to decrease hunting to maintain wildlife. However, the local hunters felt that the education and income schemes offered as alternatives to hunting did not meet their needs, so hunting did not decrease (Little, 1994). CBRM programs must help communities design management plans that, as much as possible, meet the needs of all the resource users. Numerous programs have also found that it is necessary to distribute costs and benefits fairly to avoid developing resistance within the community to management efforts (IIED, 1994).

Involving entire communities, or all users, in every decision can be logistically difficult. Often, a committee is elected to make most decisions, with the entire community voting on major decisions. In democratically functioning communities, these committees will represent the interests of a large majority of the community and most of the community will benefit from managing the resource. In these cases, most of the resource users will come to anticipate future benefits from their resources, and most community members will likely gain a greater sense of control over their lives. CBRM will have the greatest effect in these communities.

However, committees can be controlled by politically powerful individuals, the economic elite, or special interest groups, and may not consider the needs of a large part of the community. In these cases, the commu-

nity will gain far less than it could from CBRM. Community members who do not gain from how the committee decides to manage the community resources will still have no incentive to use the resources sustainably. They may also begin to actively oppose the community management, threatening the entire process. For example, in the Kundwara area of India, rich villagers dominate the forest management committees in some villages. They have misappropriated funds and colluded with forestry department staff to provide illegal timber to local carpenters. As a consequence, villagers are not satisfied with the current forestry management process (Kant and Cooke, 1998). In many hill villages in Gujarat, India, the forest management plans made by men prohibited women from using the forest to collect firewood and other non-timber products. Because the women were excluded from the planning, they do not accept the men's rules. The forest guards have great difficulty preventing women from violating the men's rules, and women have assaulted guards who tried to stop them from cutting firewood (Sarin, 1998).

For a CBRM program to be effective, it must ensure that the community committees represent the needs of all of the resource users. "Domination by elite groups can be reduced by involving a wide range of community members in decision-making and implementation, and by providing those community members with adequate training for fulfilling their roles" (Larson et al., 1998, p. 34). Communities are not homogeneous. Different groups in communities hold different views with different interests. Although it takes time to identify and involve the various groups within a community, including the various groups greatly increases the success of CBRM programs (Narayan, 1995; French and Bell, 1995; Heifetz, 1994). For example, women are not included in the Chhattis Mauja irrigation organization in Nepal, even though most of the irrigation users are women. As a result, women farmers in the head-end villages are able to take more water than they are entitled to, claiming they do not know the irrigation rules. Since they are not organization members, it is very difficult to punish the women for taking excess water. The women also do not contribute the amount of labor that the organization rules require to maintain the irrigation system. Thus, excluding women from the organization results in these villages using more water than they are entitled to and providing less labor than required, as well as in inefficient management of the system (Zwarteveen and Neupane, 1996).

Perhaps the largest group that is typically excluded from deciding how to use community resources is women. Some CBRM programs try to involve women by simply ensuring that women are on the decision-making committee. This rarely succeeds in actually getting user committees to incorporate women's needs as well as men's. Common reasons are:

- Women are socialized to not speak out in groups of men, so the women committee members don't talk in the meetings;
- When women do speak out, they often talk about what their husbands want;
- Male committee members ignore the women; and
- Committee meetings are held at a time or place that prohibits women from attending.

Where these constraints exist, each CBRM program will need to overcome them in a way that is appropriate for that culture. One model is the approach that Creative Associates, Inc. (CAI) uses with conservative Muslim and Christian villages in the Yammouneh area of Lebanon. CAI works only with village committees that include at least 30 percent women. (Despite initial resistance in some of the Christian villages, all the villages eventually agreed to this requirement.) CAI then works with the women committee members to help them articulate their concerns and present them in the meetings. CAI ensures that the committee meetings are held at a time when women are not expected to be cooking or caring for children. CAI contacts the women committee members before the meetings to encourage them to attend. If the women do not

speak in the meeting, the CAI facilitator explicitly asks for the women's input. The CAI facilitator ensures that the men either address the women's concerns or explain why they should not do so. The result has been broad support of the committee activities by men and women in the villages. The women have contributed equally to designing and building new irrigation facilities, and the men in the villages now expect to include the women in decision-making.

Programs also need to recognize that "women" is as heterogeneous a group as "men." For example, poor women and wealthy women in some Gujarat communities use different tree species. In some villages, wealthy women violate the forest management plan and cut down the trees that poor, lower-caste women rely on for income. The male forest guards do not stop this tree-cutting by wealthy women. As a result, poor women are resisting the management plan (Sarin, 1998). CBRM programs can help community committees represent the different interests among women as well as those among men.

### ***Ensure Access to Credit at Commercial Interest Rates***

A tangible measure of people's time preference is their preferred discount rate. If I value present benefits more than future benefits, then I will value \$1 today more than the certainty of receiving \$1 next year. How much more will determine my personal discount rate. Many poor people pay an annual rate of 20-200 percent interest to obtain short term loans from local lenders (Panayotou, 1993; Aleem, 1993; Siamwalla, et al., 1993). Having done so, they often need to use as much of the land and water resources as possible to ensure that they can repay the loan and the high interest. In many countries, poor farmers accept seeds and fertilizer from a buyer at the beginning of a growing season and agree to sell the resulting crop at a large discount. These farmers are effectively discounting the future market price of their crops to satisfy immediate needs and to eliminate future uncertainty. In these conditions, it is difficult to convince farmers to forgo current benefits to obtain future benefits from using their resources sustainably (such as not farming steep hill sides and leaving fields fallow).

CBRM programs can help communities shift their time preference by providing access to credit at commercial interest rates. The communities then would not need to take as much from the resource to repay loans, allowing them to preserve part of the resource for future use. Access to commercial credit would also increase the ability of land holders to invest in capital and conservation that have long-term benefits, such as trees.

When providing access to credit, CBRM programs need to consider that men and women may have different needs for and access to credit. Where women are not legally or culturally allowed to hold land title or other assets, they are less able than men to offer collateral to obtain a loan; in Zaire, for example, a woman can only open a bank account with her husband's consent, which limits her access to credit (Clones, 1992). Or the title of assets may be in the name of the male head of household. For example, in Pangasinan and Bataan, Philippines, women earn 35 percent and 25 percent of household income from their fishing efforts, respectively. However, men own the fishing boats that could be used as collateral for a loan. In this situation, improving the credit market may help men acquire equipment needed to use the resource more sustainably, or decrease dependence on fishing. But a different mechanism would be needed to help women (Gammage, 1996). This problem can be compounded if the man has migrated to a city to work and the woman is not able to use capital that is in his name as collateral. Also, women may be less literate, may not be informed about how to access and use credit, or may be excluded from groups that provide access to credit, such as farmers' groups (Quisumbing et al., 1998). The time-cost to get credit may also be greater for women than for men;

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in Kenya, the distance to a bank significantly affects whether women obtain credit, but not whether men do (Quisumbing et al., 1998), because women have less spare time than men (in part because of the extra work of cleaning, cooking, and child care).

### **ATTITUDE MATTERS**

As communities manage the resources they use, their attitudes about their resources and themselves are likely to shift in fundamental ways. We humans tend to adjust our attitudes and behaviors to be mutually consistent (Zimbardo and Leippe, 1991; Cialdini, 1984). As they receive support from and work with government agencies, communities' attitudes toward the government are also likely to change, and vice versa — the first effect of a CIMEP program to help Tunisia improve urban water and waste management was an increase in use of maternal health clinics. In working with the water agency, community members came to see the government as a source of support, rather than as something to avoid (M. Yacoob, personal communication, 1997).

People who use resources more sustainably are likely to redefine their attitudes toward those resources to be more consistent with their new behavior. As people begin to explicitly preserve resources, they are likely to internally (and generally unconsciously) redefine their behavior, from something like “I use resources” to something more akin to “I preserve resources so I can use them now and in the future.” This attitude shift can affect how people treat other resources they and others use. They may be more open to considering new ways to handle solid waste, or they may be more willing to support other conservation efforts. They may also be more willing to support nearby communities in their efforts to preserve resources (White, 1996). A society in which people see themselves as resource preservers will be a very different place from a society in which people behave as resource miners. Certainly people who practice preserving resources are more likely to support national-level efforts to conserve resources than people who do not. Communities involved in CBRM may be good places to build political support for effective regulation needed to ensure that the nation's resources are used sustainably.

Many CBRM programs are seeing these kinds of spillover effects. For example, in the Pang Ma Pha District in Thailand, with the help of an NGO, villages formed a network to manage community forests, watersheds, and farming practices. This process has been so successful that the villagers are now expanding the scope of the network to also tackle local drug addiction, conservation of hill tribe cultures and traditions, and education of students. Villagers have learned that they can solve problems themselves, and that they can improve their lives (Jantakad and Carson, 1998). In Pakistan, women who have been working with forest extension officers are beginning to travel outside their villages for the first time and to develop skills in presenting their ideas. For the first time, the women are hosting meetings for women from other villages, and participating in planning village forestry programs with men (Kane, 1998). Changes in attitude that successful CBRM fosters are arguably the most significant and long-lasting outcomes of CBRM programs.

### **CONCLUSION**

As shown above, effective CBRM is far more than just helping communities obtain the authority to manage their resources. “Local common property management will not emerge simply by giving greater official rein to local action” (Lawry, 1989, cited in Baland and Platteau, 1996, p. 284). It takes a lot of time to help people begin to use resources sustainably, and successful CBRM programs require a long time commitment

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(Brandon and Wells, 1992; Christie and White, 1997; Sarin, 1998; Larson et al., 1998; Courtney and White, 1999). It is critical to spend time initially to understand the social and institutional, as well as the biophysical, aspects of how a community uses its resources.

The projects which undertook systematic analysis of the project context were among the most successful projects, at least in part because project design matched local conditions and needs.... Yet, circumventing good base-line data collection can lead to a misdiagnosis of the threats to wild lands and the local needs, and consequently to flawed project designs (Brandon and Wells, 1992, p. 562).

“Community-based interventions alone have not solved critical [coastal resource management] problems in the Philippines” (Courtney and White, 1999, p. 6). CBRM must be part of an integrated approach to help communities and local and national governments develop the organizational and technical skills to manage resources for sustainable use.

CBRM is fundamentally about helping communities benefit from resources, not just about preserving resources. It works by helping people see how they can gain more from a resource by using it over time. CBRM may help communities see how they benefit from parts of a resource that they had not considered. However, it does not directly encourage communities to preserve those aspects of the environment that they do not perceive themselves to benefit from. Much of the value of biodiversity is less tangible to the immediate resource users than are most use benefits, except where ecotourism is feasible. Thus, even if a CBRM program is effective, it may not conserve critical biodiversity. As attitudes shift toward valuing sustainable use of resources, some communities may elect to preserve biodiversity, but this is not an immediate outcome of CBRM. Where critical biodiversity needs to be preserved, CBRM can play a role, but other measures may also be needed (such as land purchases, effectively enforced conservation areas, buffer zones around preserves, etc.) (Wells and Brandon, 1993; Larson et al., 1998).

Communities will manage resources they control to meet present and future needs as best they can. However, if too many people in the community rely on a limited resource, the community will probably still not be able to use the resource sustainably. Population pressures have caused subsistence forest communities in parts of South America to over-hunt wildlife (Robinson and Redford, 1994), caused villages in parts of Zimbabwe to replace wildlife with livestock (Metcalf, 1994), and caused emigration from Philippine fishing villages. As communities seek to use resources more sustainably and preserve biodiversity, they may need to decrease how many people use the community's resources. This requires creating alternative incomes for people that will allow them to rely less on extracting resources — “...overexploitation of village-level natural resources is often tantamount to over-employment; stress on [common property resources] directly results from a lack of alternative employment opportunities” (Baland and Platteau, 1996, p. 174). Tourism is a viable option in some places, but not all.

Even if the number of people presently using a resource decreases, the number will grow again as populations continue to grow. CBRM programs can increase the chance that resources will be preserved into the future by ensuring that communities are able to practice family planning to the extent they wish to. Many programs may be most successful in this by linking with reproductive health programs to ensure that communities have access to the contraceptives and reproductive health information they want.

Women need the same incentives as men to use resources sustainably. “New management policies must make economic sense for community members and, in making economic sense, must be gender sensitive” (Scudder, 1999, p. 15). CBRM programs need to ensure that women can enforce their rights to resources to

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the same extent as men. Programs can also eliminate other constraints women face to benefiting from resources they use (Quisumbing et al., 1998) so they can anticipate future benefits. Generally, if women are not explicitly included in deciding how to use resources, they are excluded. It is not sustainable, either ecologically or socially, for only half a community to decide who can use a resource and how — CBRM programs must explicitly involve women in decision-making. This may require extra effort, but it also increases the program's effect.

Finally, CBRM is a tool, not the goal. It is a useful mechanism to ensure that people who use a resource have incentives to preserve that resource so they can continue to use it in the future. There are other ways to accomplish this same outcome without the need for community management of resources. However, these require effective, well-informed, adequately financed, and technically competent legal and regulatory systems, highly functioning economic markets, and a well-informed, non-poor population. These conditions do not exist in many countries. Nor do the alternatives provide the ancillary benefits of helping communities learn to work together to solve problems, and shifting attitudes toward greater support for preserving the environment. Until they do, CBRM is perhaps the best tool available to enable and encourage communities to use resources in sustainable ways.

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