

**Gender in Community Development
and Resource Management: An Overview**

by

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PREFACE

With few exceptions, women are at the center of the environment and development nexus. In most communities, women have a pivotal role in economic development and in challenging poverty. They perform many of the agricultural tasks and raise small livestock, provide firewood and water, generate substantial income for the family budget from sale of handicrafts, a variety of grown and wild foods, firewood and other products, and care for their children and homesteads. To accomplish their tasks, women are, formally or informally, resource managers. As conservation actors (i.e. any individual who takes action regarding the management of natural resources) they must be fully involved in the decision-making processes regarding resource use.

Thus, women must be integrated into conservation and development efforts to meet the dual objectives of better management of the resource base and improved community welfare. The challenge to development practitioners and conservationists is not only to involve women directly in managing biological resources, but also to increase the productivity and efficiency of their labor, which will contribute greatly to their community's ability to explore new economic and conservation activities.

Within the international development and conservation communities, there is growing recognition of the importance of women's roles in the development process and in natural resource management. The primary vehicles through which most conservation and development agencies can have an effect in this area are community projects. Thus, project design and implementation must include a consideration of gender issues.

The objective of "The Gender Factor in Community Development and Resource Management" project, of which this study is a part, is to heighten our awareness of the critical roles women play in natural resource management and sustainable development, and to strengthen the skills of the staff involved in the preparation and implementation of these projects. Staff require a new set of conceptual and analytical perspectives and skills to deal explicitly, effectively, and efficiently with women-related issues in the spectrum of conservation and development.

This is the first paper in a series intended to examine the role of gender in community development and resource management. It outlines women's roles in natural resource management and economic development, as well as socioeconomic, institutional, policy, and program constraints on women and their participation in projects aimed at improving resource management and alleviating poverty. Brief examples of successful initiatives are also provided.

The priority and urgency of integrating women more fully into the development and conservation process dictate that development practitioners and academics strengthen their analytical approaches to this task. This publication and subsequent case studies are a step in that direction and, we hope, they will stimulate other similar efforts by our colleagues in the development and conservation communities.

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1. Introduction

The need for maintaining biological diversity--the variety of life on earth--is readily apparent in the statistics that show a rapid and unprecedented decline in all types of habitats--and, by extrapolation, the species that reside in them. Globally, half of all marshes and wetlands have been lost (Abramovitz 1991). Tropical forests, which contain at least half the planet's species, have been reduced to almost half their original area and continue to decline by about 17 million hectares per year (Ryan 1992). As habitats degenerate, the benefits deriving from them--such as temperature control, soil production, watershed protection, and erosion control--also diminish (Abramovitz 1991).

Loss of species also can translate into significant economic losses. Even when one considers, for example, only the value of plant-based products currently consumed, losses can be significant. The trade in one nontimber forest product alone, rattan, is worth about \$3 billion annually. In addition, rain forest plants supply key ingredients for pharmaceuticals worth tens of billions of dollars annually (Ryan 1992).

Conservationists have tried a number of different approaches to preventing habitat loss and maintaining biological diversity. Until recently, the primary means of maintaining biological diversity was the creation of national parks, wildlife reserves, and other types of protected areas. When properly implemented, according to one conservationist, no other approach is more effective in maintaining biological diversity (Ryan 1992). He points out, however, that most of the world's protected areas exist largely on paper. A significant problem, especially in

developing countries, is that creating parks has often entailed either evicting people without compensation or preventing them from using the area in traditional ways.

About a decade ago, the growing realization that the preservation of protected areas depends ultimately on the support of local people led conservationists to experiment with an alternate approach that combined limited use of buffer zones with protected areas. Based on the idea that poverty alleviation is critical to reduce pressure on protected areas, the approach seeks to balance the economic and cultural needs of local people, the environment, and future generations (Brown and Wyckoff-Baird 1992; Ryan 1992; Wells and Brandon 1992). Typically, this method of integrating conservation and development involves creating buffer zones around parks where limited exploitation of natural resources by local people is permitted; health care, clean water, schools, and other services are provided to compensate for lack of access to park resources; and economic development efforts such as ecotourism or wildlife ranching are supported (Ryan 1992).

Implementing such integrated conservation and development projects (ICDPs) is not, however, a simple matter. As Brown and Wyckoff-Baird (1992) point out, apart from an enabling policy environment, at least five components are involved in developing an ICDP strategy, including:

(1) research for planning, monitoring, and evaluation; (2) conservation and environmental management; (3) economic development; (4) institutional strengthening; and (5) brokering and balancing the interests of stakeholder groups. Among stakeholders, mainly local participants, there is often a wide range of interests, differing access to and use of resources, and variation in social status, power, leverage, and even participation in community life. In order to design and implement effective ICDPs, these differences must be taken into account.

One such stakeholder group of great importance in local communities is women. Not only are there great differences between women and men in access to and control over resources, but each gender also has quite distinct roles and responsibilities in the use and management of resources and in economic and household production that, in poor rural communities, depends significantly on the resource base and on renewable natural resources.

Thus far, women's distinct interests, roles, and responsibilities have seldom been taken into account in designing and implementing ICDPs, an omission that can be detrimental to project success. This paper explores the reasons why and how to go about changing this. It does so by raising a number of issues, including the importance of women in conservation and development, types of constraints that undermine women's sustainable use of resources and prevent women's integration into ICDPs, and the lessons suggested by a few success stories.

2. Women's Work, Poverty, and Conservation

Through their economic and household work, poor rural women in developing countries are in daily and year-round contact with the agro-ecological system upon which they depend for survival. They depend, for example, on land and water to grow food, and on forests for wild foods, medicines, fuelwood, and a host of other products that enable them to generate income or that can be used for household subsistence. By such sustained interaction with the ecological system, women have a profound impact on it and, in turn, are deeply effected by changes in it.

There is also evidence that this interaction and natural dependency fosters among some women the acquisition, nurture, and dissemination of knowledge and information about natural and biological resources, and the use of sustainable practices and conservation techniques. Alternatively, as poverty and environmental stress increase, poor women's chronic lack of access to the resources needed for survival and to new information and technologies also sometimes result in resource depletion and degradation.

Women's Work and Resource Use

The majority of poor women in developing countries are engaged in farming and related enterprises such as animal husbandry and fishing with critical dependance on the availability and quality of resources such as land, water, forests, and seeds. While patterns of participation vary, women play important and sometimes critical roles in household survival through their subsistence and income-earning activities. In many parts of Africa, for example, women are the primary food producers--contributing, on average, 70 percent of the labor for food production, 60 percent for its marketing and virtually all the labor expended in food processing (Cloud 1986). In Zaire, more women than men are involved in agriculture--94 percent of women farm as compared with 56 percent of men (Sines et al 1987). In South Asia, women do almost all the work involved in transplanting rice (Ahmed 1987) and participate to varying degrees in sowing, planting, weeding, fertilizing, and harvesting. South Asian women often predominate in post-harvest food processing and storage.

While the exact value of women's contributions to household income is difficult to estimate because much of their labor is unpaid, the few indirect estimates obtained from converting subsistence production to cash value show that women's share is substantial. Among the Nso people of Northwest Cameroon, for example, women grow over 90 percent of the food consumed in the household and contribute about one-fourth of all other household expenditures. If subsistence production is converted to equivalent cash value, it is estimated that on average women contribute about 41 percent of total household income while men supply the rest (Goheen 1988). In Cote d'Ivoire, a time-allocation survey showed that women's own earnings provided a third of the money spent on

purchased food and their own cultivation contributed three-fourths of the subsistence food consumed by households (Dey 1984). Direct estimates of women's farm earnings in wage labor confirm the value of women's work.

They show, for example, that women working as agricultural wage laborers in India are often the main, or even the sole, income earners in landless or near landless households (Agarwal 1988). In rural Bangladesh, women's earnings account for about half of household cash income (Mahmud and Mahmud 1989).

As with food production, women also depend on the availability of fodder, trees, grasses, and water for livestock production--to which they also contribute labor and which constitutes an important source of income for them. In much of the dry belt of Sub-Saharan Africa, stretching from Mauritania to Ethiopia, for example, women own and tend small livestock such as goats, sheep and chickens; a significant share of women's earnings derive from livestock. Among the Fulani women of Burkina Faso, milk is a major source of income used to purchase such household essentials as condiments, cloth, and millet (Henderson 1986). One study in Egypt estimated that 40 percent of yearly cash income for an average size farm came from women, primarily earnings from poultry and dairy activities (Larson 1988). Livestock and milk processing are also important sources of income and employment in many parts of South Asia.

Women use trees and tree products for a wide range of items such as fuelwood, fodder, fibers for clothing and mats, roofing materials, basketry, and medicines both to earn income and to meet household needs. Box 1 shows the types of forest products collected by women in Mauritania that are used directly in production or consumption.

In the Amazon, about a third of the work involved in rubber tapping is done by women and children (Abramovitz and Nichols 1992). In the state of Maranhão, Brazil, women comprise 86 percent of the estimated 400,000 rural workers who earn income from the vegetable oil extracted from the babassu palm kernel, used for the manufacture of soap and other products. The babassu palm also provides poor women with important raw materials to produce both household and market goods such as baskets, fish traps, bird cages, animal feed, and oil (Hecht, Anderson, and May 1988). Women in southern Africa rely upon wild plants for use in food, medicines, construction, tool manufacturing, and income. Baskets made by women from the leaves of palms in Botswana, Zimbabwe, and Zambia constitute an important craft export, while tubers of the grapple plant found in western Botswana are exported for use as arthritis medicine (Hunter, Hitchcock, and Wyckoff-Baird 1990).

Box 1

**Types of Non-Timber (or Minor) Forest Produce
Collected by Women, Mauritania^a**

<u>Foods and fodder:</u>	gums, fruits, leaves and grasses, chemicals from trees and plants for butter preservatives, couscous seasonings, wild grain (<i>aze</i>) used as animal fodder
<u>Medicines, cosmetics, dyes:</u>	medicinal plants, henna and pods for cosmetic purposes, incense plants
<u>Utensils, handicrafts:</u>	fronds, grasses, dyes, leathering tanning, floormats

^a Arid region of Brakna.

Source: FAO/SIDA (n.d.)

Women are also active in the capture and use of wildlife. Although men kill far more large mammals, women participate in sighting and tracking game. In Zambia, for example, women rarely participate in elephant hunts but inform men when elephants are sighted; after the kill, women perform most of the butchering, and they process the meat and other products. Women throughout Africa also capture insects, fish, reptiles, birds, bats, and rodents. In Botswana, women collect wild birds' eggs, including those of the ostrich; consume the yolks; and use the cleaned out egg shells as water containers. They use insects and insect products extensively for subsistence and cash income. In Botswana, Zimbabwe, and South Africa they gather caterpillars for sale to buyers who sell them later in urban markets (Hunter, Hitchcock, and Wyckoff-Baird 1990).

In many parts of the developing world, women are active participants in small-scale fishing enterprises. In parts of northern Botswana, women communally engage in river fishing using baskets. Along the Kariba River in Zimbabwe and Zambia, fish processing and marketing are done primarily by women (Hunter, Hitchcock, and Wyckoff-Baird 1990). In the Philippines, too, the small-scale and local trade in fish and other marine products such as oysters, clams, mussels, and shellfish is done mostly by women (UNESCAP 1985; Francisco and Israel 1991; Illo and Polo 1990; and Pomeroy 1985). Drewes (1982) found that women in three small traditional fishing villages in Tamilnadu, India, played key roles in the small-scale marketing of fish. By virtue of their economic roles women, also played a role in making decisions about the purchase of fishing nets, boats, and other fishing equipment.

Women and Conservation: Knowledge and Practices

Although information on gender differences in knowledge and use of local flora and fauna is just beginning to become available, what is known so far shows that women are quite knowledgeable both about the environment and about the natural resource base and its uses. Women of certain tribal communities in India, for example, know medicinal uses for 300 forest species (Abramovitz and Nichols 1992). A survey in Sierra Leone demonstrated that women could name 31 products that they gathered or made from the nearby bush while men were able to name only eight (FAO/SIDA n.d.). Box 2 illustrates the variety of knowledge women have about forestry, forest products, and plant and tree species.

Box 2

What Women Know About Forestry and Forest Products

- The degree of scarcity of products such as fodder, fuel, medicinal plants, resins and dyes, fruits and berries, nuts and mushrooms, etc.
- The distance a tree plantation site can be from the village and still allow women to meet work responsibilities at home and on the plantation.
- The type of planning required to integrate harvesting and processing of minor forest products with other work responsibilities and their time constraints.
- The burning properties of various wood species.
- The value of planting shade trees near the house or at selected locations in the fields to improve the quality of the living and working space and increase productivity.

Source: Molnar and Schreiber (1989).

Women also have information on the varieties of wild fruits and plants that are important supplements in the diets of poor rural people, especially during the hungry season, and on the medicinal uses of plants. In the Parana State of Brazil, the Association of Small Farmers in Turvo discovered that local women collectively knew of--and used--more than 60 medicinal plants. Although not all women were familiar with all such plants, their interest in improving such knowledge prompted the Association to set up educational meetings at which nearly 3,000 women exchanged information. As many of the plants were near extinction, the spread of information about their medicinal properties may have contributed to those species survival (UNEP 1991).

Women are also knowledgeable about, and active participants in, conservation and environmental management and in the protection and promotion of biological diversity. In some African villages, women have found ways--against serious odds--to protect animal and plant species from extinction. Lacking legal access to their own land, women keep alive as many as 120 plant and animal species by planting on the interstices among the men's cash crops (Abramovitz and Nichols 1992).

Efforts such as these, made by women to preserve biodiversity and conserve resources, have prompted noted environmentalist Diane Rocheleau to characterize rural women as holding "the threads to past knowledge of biodiversity and the skills needed to reweave the web of livelihoods and living things" (Abramovitz and Nichols 1992). However, the rapid pace of resource depletion and environmental degradation in developing countries, combined with women's poverty and limited access to technical information and productive resources, pose significant constraints for women in this and other roles.

Women, Poverty, and Environmental Degradation

Widespread and growing poverty in many developing countries, due to persistent economic recession and debt, combined with limited access to productive resources among the poor, is increasing pressure on farm and forest lands. In Latin America, 35 million of the region's poorest people, because they lack access to other land and resources and to alternate sources of income, must practice subsistence agriculture on fragile lands that are highly susceptible to further erosion (Leonard 1989). Similar conditions prevail in many parts of Africa where growing poverty is contributing to the destruction of forests and leading to desertification. These factors, in turn, further threaten the economic survival of large numbers of poor people in the future. Approximately 27 percent of the world's land which has experienced moderate, severe, and extreme soil degradation is located in Africa (WRI 1992). The rate of desertification has accelerated in recent years; many regions are experiencing falling groundwater levels, drying surface water, rangeland degradation, and deforestation (United Nations 1991). In order to meet their survival needs, the poor in Central Africa cultivate steep marginal lands and contribute to the reduction of forest and vegetative cover. Such practices are expected to accelerate the rate of erosion and soil degradation (United Nations 1991).

Among the poor in developing countries, it is often women who are responsible for providing a significant share of household income and subsistence needs such as food production, fodder, fuelwood, and water collection--all of which impact biological and natural resources. As Madeley (1991/2) points out, in areas of increasing

natural resource scarcity, women may be forced to contribute to further resource depletion in order to meet their responsibilities for ensuring household survival. Increasing deforestation, for example, often compels women to use dung for fuel rather than for fertilizer. As a result, soil fertility is reduced and future farm yields may be undermined. In fact, output losses from the use of dung for fuel in developing countries are quite substantial--a shortfall estimated at 20 million tons of foodgrains annually (Agarwal 1986).

An interrelated and often worsening cycle of growing poverty, environmental degradation, and resource depletion limits women's employment and subsistence opportunities, increases their workloads, and undermines their health and productivity (Jacobson 1992). In parts of Burkina Faso and Mali, fodder scarcity has compelled women to give up their domestic animals, thereby reducing food availability and removing a source of income (FAO/SIDA n.d.). Fuelwood scarcity in West Africa, by raising processing costs, has affected food processing and fish smoking, both important income-generating activities for women. With growing fuelwood shortages, women's workloads increase; in some Indian villages, women spend up to five hours a day in fuelwood collection and cooking in a total working day of 13.6 hours (ILO 1987). Ten years ago, in Bara, the Sudan, women were able to gather fuelwood within a walking distance of 15 to 30 minutes of their homes. Today, women must walk one to two hours in order to find fuelwood (Agarwal 1986). As time is an important and sometimes binding constraint for poor women in developing countries who commonly work very long hours, increasing resource scarcity that requires them to spend even more time on survival activities means less time available for enhancing their productivity and incomes and enabling them to overcome poverty.

3. Socioeconomic and Institutional Constraints on Women

The ability of poor women in developing countries to overcome poverty, enhance productivity, and use resources sustainably is hampered by social and institutional factors that include lack of access to land, to credit, and to education. Women are also often excluded from membership in community organizations that make decisions with respect to production and conservation. In addition, women's multiple economic and household responsibilities impose severe time constraints.

Lack of Access to and Control Over Land

A key institutional factor that undermines women's economic productivity and ability to use resources sustainably is lack of access to land. Throughout the developing world, few women own or have title to land--although, in many places, they have the right to use land. Lack of ownership affects women's farm and non-farm productivity in a number of important ways. First, as land is often required for collateral in obtaining institutional credit, lack of title reduces women's access to loans that may be needed to purchase productivity-enhancing inputs, tools, and equipment or to build inventory if they are in trade. Second, without proper title to land, women farmers are unlikely to make additional investments and assume the kinds of risk necessary to improve their agriculture. Third, if women are restricted to the more marginal lands, as they sometimes are when land becomes scarce, their productivity will necessarily be lower.

Lack of secure title to land can also prevent rural women from changing current practices that harm the environment and adopting beneficial ones. Persuading women to grow trees and participate in social forestry projects can be difficult if they do not have land on which to grow trees or if they are not guaranteed ownership of the fruits and timber. Tree and land tenure rights are interrelated in some parts of Africa. Historically, women have not had the right to plant trees because this could give them rights over the land on which the trees are planted. In northern Cameroon, some men let their wives plant only short-lived trees such as papayas that do not confer land rights (Williams 1991).

Recent reforms may have worsened the situation for women by undermining their rights to land under customary laws and practices and creating ambiguities, dependencies, and insecurities that did not exist earlier (FAO/SIDA n.d.). For example, the act of replacing customary rights to land with exclusive male ownership may require women to seek men's permission for farming or gathering activities formerly recognized and provided for through traditional means. As a result, women's responsibilities are out of balance with their legal status, their formal rights to land, and their rights to plant and use trees and their products.

Lack of Access to Credit

Like most small and microentrepreneurs, women experience great difficulties obtaining access to institutional credit because lenders erroneously perceive them to be risky borrowers, and because the administrative costs of making small loans is high. Women are at a particular disadvantage because, as mentioned above, they do not generally have title to land, an asset commonly used as collateral. In some developing countries, moreover, women do not have the right to act in their own legal capacity. They depend on their husbands or other male relatives for approval to acquire or transfer property and apply for credit.

Given these circumstances, women rely heavily on informal sources of credit such as relatives, friends and moneylenders. The advantages to women of these sources of credit are that they do not require collateral and provide flexible terms and conditions. The disadvantages, however, include the high rates of interest informal moneylenders charge (Lycette 1984).

Lack of access to institutional credit is a key constraint to enhancing women's economic productivity and returns in agricultural production and off-farm enterprises. It prevents women from purchasing inputs such as fertilizer, improved seeds and farm machinery. It also prevents them from making larger and longer-term investments in more productive crops. In retail or small manufacturing and craft enterprises, it may prevent women from buying stock and raw materials in bulk and at lower cost which hinders long-term planning and reduces efficiency.

Lack of Access to Education

Although the developing world has made considerable progress in improving women's literacy and education in recent years, significant deficiencies persist. In 1985, just half of adult women in developing countries were literate. In Africa, only 36 percent of women were literate. In Pakistan, just five percent of rural women were literate in the early 1980s. Significant gaps also remain between girls' and boys' education, even at the primary levels where the largest gains have been made (Table 1). In 1990, just 20 percent of girls of the appropriate age were enrolled in primary school in Niger, for example, compared with 38 percent of boys. In Senegal, primary school enrollment among girls was 49 percent, compared with 71 percent for boys (World Bank 1990b).

Table 1. Female Education as a Percentage of Male Education, 1980

	Numbers Enrolled		
	First and Second Level		Third Level
Latin America	96		77
Middle East	69		41
South Asia		56	34
Far East	84		57
Oceania	76		25
Africa		75	36

Source: Sivard 1985

High rates of illiteracy and low levels of education among women have been shown to constrain women's productivity and may affect their receptivity to new techniques and skills in conservation. In agriculture, an important sector for women's employment, studies show that improvements are strongly linked to education, and that educated farmers tend to be more likely to adopt modern practices. Binswanger (1989) cites evidence that literacy raises the demand for fertilizers, increases investments in draft power and results in increased output. Although no direct evidence is available on the links between education and the adoption of new conservation techniques and practices, it is not unreasonable to hypothesize that education may contribute to improvements in conservation practices. This issue deserves further investigation.

Lack of Access to Organizational Membership

Women are often unable to participate in development and conservation projects because they lack access to membership in community decision-making and producer organizations. In three Tamilnadu fishing villages in India, Drewes (1982) found that, because of their economic role as fish traders and income earners, women had a voice in household decisionmaking about investments in nets and other fishing gear and in household purchases. They were not permitted, however, to participate in community affairs. They were not eligible for election as village leaders or as members of the village council. Nor were they allowed to participate in the election of the village headman or to take part in village meetings where, among other things, village financial and economic matters were discussed.

In most developing countries, even if formal membership cannot legally be denied, women are rarely represented in community decisionmaking bodies such as local governments. In producer groups such as cooperatives, women are not usually barred from membership but may be excluded because membership is based on land ownership or reserved for the household head, generally assumed to be a man. In Senegal, although there is no legal obstacle to women's membership, very few of more than 2,000 agricultural cooperatives have women members. Of the 249 members of one cooperative, only four were women. Women constitute just one-third of the membership of producer groups or "para-cooperatives" that practice both communal and individual farming (Creevey 1986; Lamming 1983).

The case of the Integrated Social Forestry Program in Cebu, the Philippines, illustrates how the exclusion of women from local organizations can limit the success of a program designed to combat poverty and environmental degradation. The program was designed to improve forest management by guaranteeing land tenure to participants who were organized into community associations; new technologies were introduced through the associations. Although subsistence farming, the main occupation, was a collective household responsibility involving men, women, and children, the project initially focused only on men. When a farmer's association was created, the core members were all male, except for one woman. Membership was based on possession of land stewardship certificates that were given only to men. Although women attended meetings, they seldom participated in the discussion. Information on soil conservation, tree planting, planting materials, and other inputs were also given only to men. Project staff met with women only when men were absent. A few years after the project started, women--who had observed the new methods--themselves started to practice some of the conservation techniques. Eventually, the women urged project staff to create a separate organization for them. By this time, the staff was ready to do so because they realized that the exclusion of women from project resources was a serious limitation on its success (Borlagdan et al 1989).

Time Constraints

Time limitations resulting from women's economic and home production roles significantly affect their ability to respond to production incentives and perhaps also to participate in conservation projects. This is particularly true if the innovations or conservation practices require additional labor inputs.

In contrast to men, women are responsible for economic production and have primary responsibility for household production such as childcare and cooking. These are time-consuming and burdensome tasks that permit little flexibility or rescheduling. An extensive literature documents that poor women generally have little or no surplus time to devote to additional activities unless substitutions can be made for other responsibilities. In parts of East Africa, women work 16 hours a day doing housework, caring for children, preparing food, and raising between 60 percent and 80 percent of the food for the family (Fagley 1976). Nigerian women work from 15 to 19 hours per day, 8 to 10 of which are spent on farming activities. In contrast, men spend only 6 to 8 hours per day in farming during the busiest times and about one-half hour per day on household chores (Elabor-Idemudia 1991). The impact of resource depletion on women's workloads has already been noted.

An additional, dilemma posed by the time constraint is that even if women want to participate in conservation projects, if this involves additional labor and time, they may not be able to do so without reducing time spent in other economic and household activities that are critical for survival.

4. Policy and Program Constraints

Very often women are not helped by policies and projects intended to promote conservation and development. This is because women's roles are often overlooked, and policies and projects are inappropriately designed and executed with respect to women. Even though women are key actors in the use of resources and in production, policymakers and project staff often assume that women and men do not have distinct roles and responsibilities and therefore that project interventions, information, and technology made available to men will automatically reach women. As a result, women's roles are frequently ignored, often at the risk of jeopardizing the success of projects. Information and technology are targeted to men and not women, and staff are not generally made available or properly trained to work with women and meet their specialized needs.

Ignoring Women's Roles

The development literature has documented at length how the failure to integrate women into development projects can contribute to their lack of success. In an evaluation of 102 A.I.D. projects, Carloni (1987) demonstrated that those with women's participation were more successful than those without. Over the past decade, parallel literature began to emerge on the negative consequences of ignoring women's roles in environmental conservation activities. Box 3 provides an example of how an otherwise well-conceived conservation project failed to include women in community discussions about local involvement in conservation of wildlife and natural resources and thereby undermined the project's efforts to enable the community to use and manage palm trees more sustainably. It was not until women--the real users and managers of the palm trees--were both drawn into the dialogue and assumed responsibility for monitoring the trees, did the conservation strategy succeed.

Box 3

Finding the Right "Community" for Conservation Projects

Wildlife and rugged scenery are the major natural resources and the main attractions for a thriving tourist industry in Western Kaokoland, Namibia. In order to reconcile the interests of the local community of semi-nomadic Himba herders, conservationists, and tourists--and to preserve the region's natural resources--a conservation project attempted to give the community a stake in their own resources by making them the beneficiaries of levies imposed on tourists and establishing a craft market in which they could sell their products. For a while it seemed that the project was successful both in providing an alternative source of income for the community through craft sales and in imputing value to the wildlife.

It soon became clear, however, that the strategy agreed upon with the community for the sustainable use of the omurunga palm (*Hyphaene ventricosa*), used in the manufacture of baskets for sale and local use, was not working. The palm trees were dying at an accelerated rate.

Discussions with the "community" that led to the evolution of the palm conservation strategy had meant talking to village elders and others, mostly men. It had, notably, excluded women who were the real users of the palms from which they made baskets to hold milk--a resource that traditionally belonged to women. When project staff negotiated with men to monitor the use of palm trees, women felt that their right to use and control milk had been undermined. The solution was simple and once women were included in the discussion and assumed responsibility for monitoring the trees themselves, tree conservation became more successful.

Source: Jacobson (1991).

In another example, from Nepal, a government-sponsored community forestry project made no special effort to involve women in conservation. Because Nepalese women are not traditionally active in public affairs, project designers overlooked the fact that women could have distinctive roles in the utilization and management of forest resources. In fact, women did have roles that impinged upon the project, and their exclusion nearly jeopardized the project's success. Fortunately, project staff quickly recognized this, investigated women's roles, and discovered that they needed to secure women's cooperation to ensure the success of forest replanting. As women are generally responsible for grazing livestock, their cooperation was necessary to alter stock feeding practices by moving herds away from newly planted areas. This also required persuading women to change from grazing to stall feeding--a practice that they were reluctant to adopt because it required several hours of labor daily to cut grass. Later, project staff discovered to their surprise, that the men were actually quite ill-informed as to household fuel and fodder needs and uses, compared to women (Molnar 1989).

In another example from Cajamarca, Peru, a misunderstanding about women's roles led government officials to inadvertently encourage women to abandon the lands they had traditionally cultivated. Women were encouraged to form *Clubs de Madres* (Mothers' Clubs) where they were offered literacy and craft classes and free food. As a result, women no longer farmed and maintained the land, soils were eroded, seed stocks were lost and malnutrition increased. Fortunately, the Pilot Project of Andean Ecosystems (PPEA), a United Nations Environment Programme project, stepped in to attempt to reverse the damage. The project successfully re-introduced vegetable cultivation among the women of the *Clubs de Madres* and succeeded both in maintaining and increasing the seed stock and in preventing further soil erosion (UNEP 1991).

Differential Delivery of Information and Technology

The development literature is filled with examples of the ways in which women have been displaced by the introduction of new technologies (see, for example, Carr 1985 and Ahmed 1987). Not only are new technologies not introduced to women but they are very often utilized without regard to the potential impacts on women, sometimes with very negative consequences on women's employment and income earning abilities. Some of the same errors are being repeated in projects which introduce new conservation methods and techniques. Conservation programs for large mammals could have a negative impact on women if, for example, their crops are endangered. Tyua women in northern Botswana sometimes spend nights cracking bullwhips to make noise to keep elephants away from their fields. Large populations of mammals can also limit women's access to other wild products if the danger from the mammals threatens them enough to prevent them from travelling to collect such products (Hunter, Hitchcock, and Wyckoff-Baird 1990).

Technical information such as that provided through agricultural extension programs seldom reaches women. The methods used to disseminate information, such as the contact farmer approach and the use of training centers, also tend to channel information to wealthier farmers, who are generally men (Berger, DeLancey, and Mellencamp 1984). Extension agents often do not consider women to be their clients. Women's participation in extension programs is also limited because of their lack of education, lack of control over land, time constraints imposed by their multiple household and economic activities, and the structure of extension programs, which tend to use mostly male agents or schedule training sessions at times when women cannot attend. Two community-based wildlife projects undertaken in Botswana provided training only for men. Some women who were interviewed felt they had been overlooked by extension personnel and pointed out that large mammals were just as much their concern as men's (Hunter, Hitchcock, and Wyckoff-Baird 1990).

Extension agents and project designers often assume that newly-introduced methods and techniques to increase productivity or improve conservation will have similar impacts on women and men. In fact, this is often not true, because women and men have distinct roles and responsibilities; project interventions that benefit men can have negative impacts on women's incomes and work. Dankelman and Davidson (1988) report that the introduction of tractors and modern ploughs for rice cultivation in Sierra Leone reduced the length of men's work day. But the associated increase in weeding and maintaining the larger fields meant that women had to put in 50 percent more labor than before the machines were introduced. In Niger, a wind break project that was regarded as a "success" because participants were able to raise crops between newly planted trees caused women's incomes to fall. It was later discovered that women used to keep small ruminants in the cropped areas but had to give up this practice when they were fined for letting their animals stray into the areas where the crops were planted (FAO/SIDA n.d.).

Another common misconception is that information provided to male heads of households will automatically reach women in the household. In fact, there is growing evidence to show that women and men have quite different channels of communication and receive information from very different sources and in quite different ways (Collier 1990). Providing information only to male household heads also excludes those households headed by women. This error is even more serious when, as is the case in some developing regions, female-headed households comprise a large percentage of total households. In parts of Africa, for instance, up to 50 percent of households may be headed by women.

Staffing Patterns and Training

Conservation and development projects in many developing countries lack adequate staff, especially female staff, to provide information and training to women. Understaffing can be a particular impediment to women's involvements, as studies show that extension and training staff tend to favor men. A survey in Nigeria's Ogun State Agricultural Development Project revealed that extension agents visited just 10 percent of women farmers every week, whereas 70 percent of the men received weekly visits (Elabor-Idemudia 1991). Moreover, extension staff often tend to be overloaded with work, having responsibility for management, training and extension visits over large areas. Under such conditions, they are unlikely to be responsive to any directives to expand outreach to women.

Lack of female staff in development and conservation projects and agencies also poses a problem in reaching and training women; it exists at all levels--extension workers, forest rangers, and policymakers. The shortage of women foresters, in particular, is quite severe (Williams 1991) and some countries have no trained women foresters at all. The Indian Forest Service, a very large government agency, appointed its first three female professional staff members as recently as 1979 (Skutsch 1989). In cultures where women are secluded and interactions between women and men are customarily disapproved, such as in Muslim societies, lack of adequate numbers of female staff may be a limiting constraint that effectively precludes women's participation. In other cases, the problem may not be so severe, although female extension agents and foresters are sometimes more effective in working with women. This was found to be the case in forestry projects in both Cameroon and Mali (Williams 1991).

Lack of training in working with women is yet another constraint that affects both male and female staff of development and conservation agencies. Staff generally lack understanding and appreciation of the roles women play in environment and development, of the importance of including women in projects and of appropriate techniques to reach and to involve women. Fortunately, there is a growing body of literature on what works in drawing women into conservation and development projects. A few examples are provided below, along with the project and policy lessons that can be learned from them.

5. What Works? Success Stories in Resource Management

Available case studies of women's involvement in conservation and development, though few in number and quite disparate in approach and implementation, offer fairly consistent and simple lessons that can be readily replicated. Five such case studies and the lessons to be learned from them are summarized below.

From Wastelands to Silk Farms (Bankura, India)

A small village in the Bankura District of West Bengal, India, is the site of a unique experiment in land reclamation that has had a widespread impact in regenerating wastelands, creating employment and income for women, and building women's organizational and leadership skills. The process started in 1980 at a meeting--convened by the West Bengal Minister for Land Reforms with the assistance of the Centre for Women's Development Studies (CWDS), an independent research organization based in New Delhi--to explore the potential to assist local women. The women, who belonged to the Santhal tribal group, were mostly poor, illiterate, and landless. Deforestation of the local area had deprived them of their livelihood, primarily shifting agriculture and collection and processing of forest products. As a result, they were compelled to migrate several times a year in search of employment. Their most urgent needs, as they suggested at the meeting, were to secure locally-based employment and income.

Following the meeting, and with the support of the CWDS and state government officials, some women decided to form self-help groups (*samities*) and start small income-generating enterprises. Shortly thereafter, the first three *samities* received donations of wastelands which they decided to reclaim and plant with silk trees. The project was successful, and within three years the group had a fertile plot of land with flourishing silk trees.

The success of these groups prompted other women in the area to organize and undertake similar reclamation projects. By 1988, there were twelve *samities* with a membership of more than 1,500 women engaged in land reclamation and income-generating projects. As a result of their efforts, 100 hectares of former wasteland were reclaimed and revegetated. Sheet erosion was reversed and ground water recharged. Over time, the *samities* diversified their income-generating activities from silk production alone. Using local raw materials, they began to produce items such as leaf tableware and ropes from local grasses (ILO 1988).

A substantial amount of credit for the success of the *samities* and enterprises belonged to the women themselves. A critical factor in the success of both conservation and income-generating efforts was that the women worked initially with locally available resources and with skills and knowledge they had already. They diversified into new products only after they established a strong base and had the opportunity to learn new skills and techniques. They were greatly helped by the CWDS, which organized workshops and training sessions, arranged for consultants to provide technical assistance, and intermediated with government officials and agencies. Other contributing factors included the tradition of group action among the Santhal women that helped them organize and act collectively, the assurance of government purchase of the silk and other goods produced that provided a guaranteed market, and access to and control over land which enabled them to generate employment for themselves.

While some of these factors cannot be easily replicated, the concept of linking conservation with economic development is workable and often necessary. As is well known, a major difficulty implementing conservation projects is that they conflict with the short-term survival needs of poor rural people. By linking conservation with employment and income-generation, as was done in Bankura, participants' ensured that short-term survival needs were met along with long-term conservation goals.

Self-Help and Soil Conservation (Katheka, Kenya)

Establishing the link between conservation and development was the key factor in the success of a community-based soil conservation project in Katheka, Kenya. Katheka is a marginally productive semi-arid region that by the 1970s was facing a severe environmental crisis due to massive soil erosion, water shortages, and deforestation. Food production per capita was declining--a serious problem in a community where farming is the main subsistence activity and very few options exist for additional employment and income. Although little was being done to change the situation in the 1970s the community, fortunately, had the institutional structures, skills, and resources required to do so. An impetus was needed, however, to start the process (Thomas-Slayter, Kabutha, and Ford 1991).

This motivation was provided in 1973 when a newly-appointed assistant chief mobilized the local voluntary self-help groups known as "*nwethya*" to engage in conservation activities. *Mwethya* groups, made up mostly of women, started by working on community water projects such as bench terracing, dam construction and installation of hand pumps. By the 1980s, 91 percent of households surveyed built bench terraces, 66 percent planted grass on the terrace edges, 81 percent used contour plowing, and nearly all intercropped and used practices such as composting, cover crops, or animal manuring to maintain soil fertility. In addition to environmental protection, the groups also worked together to find ways to generate income by identifying markets for traditional crafts and initiating new enterprises.

The strategies followed in Katheka had much in common with those successfully implemented in Bankura--both were closely linked to the community's survival. As women were the main food producers, they understood well the importance of maintaining the natural resource base and water supplies. They were highly motivated to undertake the arduous work involved in environmental protection and were willing to do so on a voluntary basis. In order to avoid conflicts with farm work, they scheduled conservation activities for the off-season.

The groups relied initially on local labor and resources and the skills they already possessed such as bench terracing. The group self-help tradition was already established among the women, it needed strengthening and development. The support and encouragement from government officials and the focus provided by the need for environmental protection was just the encouragement needed.

At first, the groups relied on sharing local knowledge and building incrementally on the visible successes of their early efforts. Later, four group leaders attended a conservation workshop to improve their skills and learn new techniques. Additional training and technical assistance were made available at critical points, mainly through an agricultural extension officer stationed nearby who introduced improved methods that reduced the amount of work involved to build and maintain the terraces. Finally, the support provided by local, governmental and non-governmental personnel was a critical factor in the success.

Tree "Huggers": The Chipko Movement (India)

Group strength and cohesion were the critical factors contributing to the success of another well-known grassroots conservation effort--the Chipko movement in India. Chipko began as a protest to save trees from commercial exploitation. Members of local communities, primarily women, joined hands and encircled trees to prevent them from being felled by contractors. The movement spread rapidly and soon involved more than 5,000 villages. Afforestation and community development are now the main focus of the movement.

Today women work together to build protective walls around their fields, grow grass, and plant trees. Tree planting efforts are led by *Dasohli Gram Swaraj Mandal* (DGSM), the organization at the forefront of the Chipko movement, which organizes ecodevelopment camps for this purpose. Survival rates for Chipko plantations range as high as 80 to 90 percent. The women's efforts led to rapid and substantial increases of biomass and brought economic benefits to the communities (Dankelman and Davidson 1988; and FAO/SIDA n.d.).

An important factor in the women's success is the sense of strength derived from organizational unity. Collective action may have been particularly important to the success of the women involved in Chipko because, being poor, they were especially powerless and group action enhanced their bargaining power. Group cohesion, however, is not easy to promote. In the Chipko movement, several factors combined to facilitate the process--namely the relative absence of class and social divisions in the participating communities and the immediacy of the threat to community survival due to deforestation.

Reforestation Reoriented (Nepal)

For the hill women of Nepal the forest is a vital source of household products, fuelwood, animal fodder, and fertilizer. Because women and children are the primary collectors of fuelwood and forest products, as well as the herders of family cattle, sheep, or goats, their practices most directly affect, and are affected by, the status of available biological resources. Before the introduction of a government-sponsored forestry project in 1980, environmental damage and deforestation threatened the very existence of these women and their families (Molnar 1989). The objectives of the project were to limit deforestation and to improve the availability of forest products for subsistence needs.

When the project started, however, no specific effort was made to incorporate women into its activities. No women workers were recruited and trained as forest extension workers. Women's needs were not considered, and they were rarely approached by extension workers. This omission almost undermined the entire project. A key component of the project was to reforest areas that women were accustomed to using as grazing grounds for their herds. As women were not included in the decisions involving reforestation they continued--as usual--to graze their herds in the newly planted areas, thereby endangering the survival of the seedlings. Fortunately, project staff soon realized the problem and started consulting the women. This change required a significant restructuring of the project.

Changes include, training project staff at all levels--extension workers, nursery foremen, and forest watchers--about the roles and responsibilities of women and about the importance of involving them. Extension materials were adapted to reflect both women's roles and the information acquired from women about the value and use of forest resources--details quite different from the information obtained from men. Differences in male/female education levels and channels of communication required adopting different techniques for reaching women. Finally, female extension staff had to be hired and trained to address women's specific needs and interests.

An additional problem in attempting to involve women in decisionmaking and positions of authority as forest watchers and supervisors was that women in this particular community in Nepal were not accustomed to being in these roles. Special efforts had to be made to recruit them--which were not particularly successful except in a few cases where women themselves took the initiative and came forward.

Protecting the Mangroves (the Philippines)

A case study of the Cogtong Bay Mangrove Management Project in the island of Bohol, the Philippines, demonstrates that significant opportunities for furthering conservation and development can be lost if women's roles are overlooked (Mehra, Allcott, and Baling 1992). Though endangered, mangroves represent an economically and ecologically valuable resource in the Philippines. The project in Cogtong Bay was an attempt to save mangroves and bay resources and, indirectly, to enhance the productivity and income of small fishermen and farmers who relied heavily on these resources for their livelihoods. A key objective was to give individuals secure tenure over coastal areas as an incentive for better management. The project worked through community associations set up to undertake activities such as mangrove afforestation and rehabilitation, mariculture, and the prevention of illegal fishing.

Women were as involved as men in using coastal and other natural resources to meet household income and subsistence needs through activities such as fish marketing, oyster collection, processing and sale, farming, home gardening, and livestock raising. Realizing their economic value, women were also deeply concerned about depleting resources. The project, however, made no particular effort to involve women. Fortunately, the women took the initiative to become involved, sometimes more actively than men. They attended association meetings (often as proxies for their husbands), participated in planting mangroves, attended training in mariculture, and reported illegal fishing to authorities.

Regardless, women's roles were limited because they were not directly targeted by the project nor did they have access to project benefits which the potential to enhance productivity, incomes, and contributions to conservation. Most women were not official members of the associations nor could they obtain the Mangrove Stewardship Certificates that guaranteed tenure over mangrove plots. Both privileges were reserved for male heads of households. The only exceptions were for widows or single women. Thus, the incentive effect of secure tenure was lost on women. Also, by not being "official" association members women were effectively excluded from access to the credit offered through some associations. Lack of land tenure, as with tenure over mangrove plots, meant that women did not have collateral to offer to obtain credit from other institutional sources. This was an important constraint for most women--who engaged in a variety of enterprises and were seeking to supplement their incomes by improving their current enterprises or launching new ones.

6. Lessons Learned

The five case studies summarized above represent a variety of rural communities, a range of conservation problems, and different approaches to solving these problems. Although community participation and the mobilization or integration of women are central to the success of four of them, the approaches vary considerably. The project in Nepal is a "traditional" government-sponsored structured extension project whereas Chipko is a much more spontaneous grassroots "movement" that gradually obtained some structure. In Bankura, the women acted collectively through self-initiated and self-monitored groups although other elements in their success were land donations and the assistance of an intermediary agency, the CWDS. The women of Katheka had a tradition of collective self-help that they revived and applied to new goals--soil and water conservation. Despite the differences between these conservation efforts, they have some features in common that accounted for their success and suggest some important lessons:

- Recognizing the roles women in the economy and the environment and incorporating this information into the initiation and design of conservation and development projects can enhance project success.
- Projects that link women's economic survival needs with conservation efforts have a greater likelihood of success.
- Demonstrating to women producers that the future of their livelihoods depends on the present use of renewable resources is more likely to result in the adoption of sustainable practices and of protective actions.
- Conservation and development projects designed to start out with and build upon women's traditional activities and skills are more likely to succeed. The corollary is that traditional skills need to be buttressed with training and technical assistance when it becomes clear that the current stock of information and skills is no longer appropriate or adequate to address the problems at hand.
- Recognizing, seeking, and incorporating the information and knowledge women have about the environment and the conservation of resources and biological diversity can result in better-designed projects.

- Often, small changes in techniques made at low cost may be sufficient to bring about substantial improvements in conservation and productivity.
- Women's participation in conservation and development projects can be enhanced only if conflicts between their multiple responsibilities (economic, household, community, and conservation) are minimized.
- Intermediary institutions with information, technology, and economic and political access can enable women to overcome their chronic lack of access to resources which can be a binding constraint on their productivity and hamper conservation efforts.
- Collective or group action of the grassroots can be very effective in mobilizing poor women and enhancing their bargaining power with agencies that have access to resources and political clout. Successful group action may, however, require special conditions to make it workable--conditions such as a tradition of collective action or an exogenous factor such as an impending threat to survival that provides the impetus for group cohesion.
- Integrating women into extension-sponsored conservation and development projects may require substantial changes in traditional extension programs, such as training extension staff in awareness of women's roles and responsibilities, both in conservation and the local economy; hiring of female extension staff; rescheduling visits and training programs to coincide with women's schedules; and adopting new communications techniques such as adaptation of materials, both to reflect women's knowledge and to reach them better.

The lessons derived above provide an excellent starting point for planners and policymakers to begin to respond to gender differences in the use, management, and conservation of resources and the integration of women into the design and implementation of conservation and development projects. These lessons are, however, based on just a handful of case studies. Multiplying the number of case studies involving women in conservation and development would go a long way both towards verifying lessons learned and extending them.

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