Community-Based Natural Resource Management: Case Studies from Community Forest Management Projects in Ghana, Mexico, and United States of America

By

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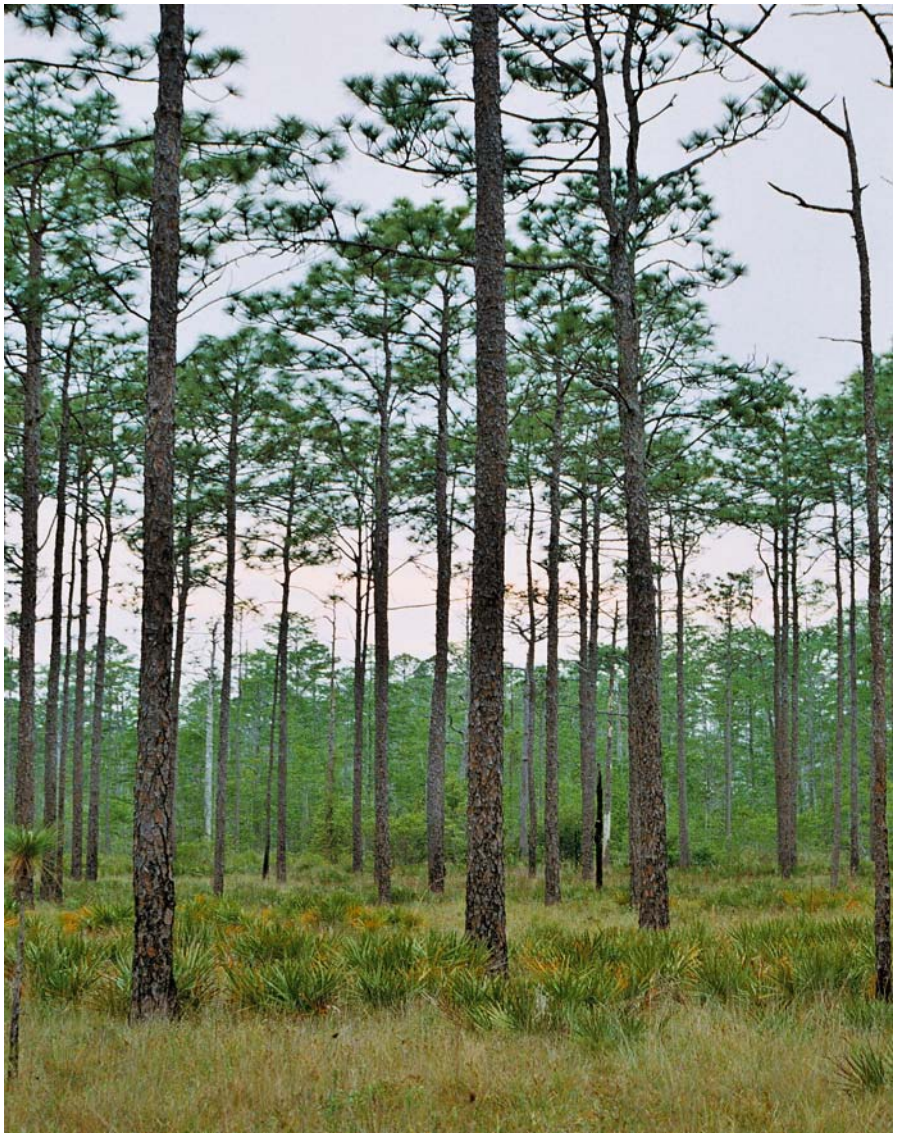

Executive Summary

Community forest management (CFM) is an approach to natural resource management that takes into account the human communities living around or within a resource. CFM has become more common in both developed and developing countries since the 1980s. Generally, CFM focuses on interdependent ecological, economic, and social elements, and has therefore been categorized as one form of sustainable development.

Although CFM projects have grown in number, the success of such initiatives varies widely. This is due to a number of factors that are influenced by the local, national, and global context within which a project is situated. For example, Ghana is a country that has experienced severe deforestation and, as a result, has implemented CFM strategies to address the ecological health of its forests in addition to achieving social and economic development goals. However, the lack of clear land tenure and strong local institutions, as well as residual post-colonial and international paradigms related to resource management, impede the feasibility of CFM projects in the country. The United States, another country with various examples of CFM, has been more effective when NGOs work with private landowners, but less effective when community groups attempt to incorporate local goals into management of national forests. In Mexico, on the other hand, CFM has been more successful because communities have the legal support from the Mexican Constitution to autonomously manage their forests. Mexican communities have been able to implement CFM within the context of their locales and also compete in global markets.

There are some common themes that emerge through investigation of CFM projects in Ghana, United States, and Mexico that are important to the development of CFM as a form of sustainable development. Clear land tenure, which includes ownership, access, and use rights, designates who may use a forest resource and to what degree, which can improve more sustainable management. The development of strong local institutions that regulate behavior is another important theme in CFM. The integration of various disciplines and traditional knowledge as well as cross-scale linkages between local, regional, national and international actors are also important factors that help communities build capacity for sustainable management.

Clear land tenure, strong local institutions, and interdisciplinary cross-scale linkages are not, however, the ultimate determinants of success. Other factors are also important, such as the effects of the global market economy on local communities. However, in spite of the variability of factors that inform and dictate CFM projects, there is evidence that it holds promise as a sustainable development strategy as long communities and national governments are committed to making these strategies work.

Literature Review

Introduction: Concepts and History of Community Natural Resource Management

Natural resource management theory and practice has shifted significantly in recent decades. In many countries environmental management has been the realm of national or state governments, with little recognition of the people living closest to the resource. However, the idea that local people may have a role to play in the planning and management of their surrounding environments is gaining ground. One form in which this concept has been applied is community-based natural resource management (CBNRM). By decentralizing natural resource management, CBNRM is an effort to incorporate local communities into guardianship of their immediate environment in an attempt to meet ecological and social goals on both local and global scales (Agrawal & Gibson, 1999).

The practice of CBNRM has been supported by a number of movements and paradigm shifts in theory regarding humans and the environment. The "flux of nature" paradigm shift in ecology, for example, promoted new thinking in how species, especially humans, relate to their environments. The flux of nature concept has various elements, namely that a systems approach is most appropriate for ecosystem management, humans are a part of the landscape, and participation by humans in natural resource management is a viable and necessary endeavor (Berkes, 2004; and Callicott, 2003). This conceptual change allows for more incorporation of local groups in management of natural resources rather than trying to exclude them completely as has been done historically (Agrawal & Gibson, 1999; Berkes, 2004; and Leach, Mearns & Scoones, 1999).

Interdisciplinary approaches to natural resource management, informed by fields such as political ecology and ecological economics, have also developed with the flux of nature paradigm shift and have implications for CBNRM (Berkes, 2004). These approaches to environmental issues are largely related to the fact that economic and social disparities are often the root causes of natural resource degradation (Thrupp, 1993). The more contemporary emergence of sustainability science, a multi-disciplinary approach to sustainable development, illustrates a convergence of traditional, indigenous, and scientific knowledge from both the social and physical sciences (Burns, Ardoin, & Weaver, 2006; and Kates et al., 2001). In fact, CBNRM has been acknowledged by the United Nations as a form of sustainable development, which has ecological, economic, and social goals (WCED, 1987). Meeting the multi-faceted goals of CBNRM requires interdisciplinary approaches and it is evident that there is momentum in political and academic discourse to address such issues.

CBNRM has grown in practice in both developed and developing countries, but its reasons for implementation vary widely depending on both the local and national context. In developing nations, CBNRM has been used as a dual conservation and poverty alleviation strategy, especially for indigenous groups (Kellert, Mehta, Ebbin, & Lichtenfeld, 2000; and Western & Wright, 1994). It is largely related to the realization that biodiversity conservation initiatives that impede local peoples' access to natural resources utilized for their subsistence and livelihood have been unsuccessful (Agrawal & Gibson, 1999; and Chan et al., 2007). The creation of national parks and reserves, for example, has been a major source of conflict between urban and rural citizens because of their exclusionary nature (Kijtewachakul, Shivakoti, & Webb, 2004; and Redclift, 1993).

This is complicated by unclear land tenure because native groups often have no documentation of ownership (FAO, 2007). CBNRM in developing countries has been initiated by international non-governmental organizations, international institutions (e.g. United Nations), and national governments (Kellert et al., 2000; and Western & Wright, 1994). Local communities have also implemented CBNRM without the guidance of external agencies and primarily in response to exclusionary management of public lands (e.g. Kijtewachakul et al., 2004) or recognition by community members of resource degradation (e.g. Murali, Murthy, & Ravindranath, 2006).

The inception of CBNRM in developed countries is less associated with poverty alleviation and direct subsistence for local peoples. However, it is often related to indigenous groups, but generally these groups have more clear land tenure and ownership than those in developing countries (e.g. Native American tribes in the United States, Maori groups in New Zealand, and Aboriginal tribes in Australia). Land tenure and biodiversity conservation play an important role in why cooperation between local communities and conservation groups has emerged in developed countries. In the United States, for example, most land not held by state or the federal governments is privately owned and managed, so promoting landscape level habitat conservation requires the cooperation of these private land owners (e.g. Benson, 2001).

Although some authors argue that the differences in implementation between developing and developed countries is significant (e.g. Redclift, 1993), in reality it is less useful to highlight the differences because the discrepancy is largely a question of scale. Economic issues are a large component in both developing and developed countries. Projects in developing countries are related more to poverty alleviation, whereas poverty

in developed countries is less drastic and therefore addressed differently. Most projects are attempts to merge two often dichotomous interests: conservation and economics. Land tenure is an issue in both cases, though for different reasons because land tenure is often more clear in developed countries. CBNRM is an attempt to allow local people access to manage their surrounding natural resources, whether for direct subsistence or economic livelihood, and to preserve the species and ecological function that comprise native ecosystems. These projects are often initiated in biologically diverse areas where human activity has been a cause of ecosystem degradation and population declines of native flora and fauna. In totality, the differences between developed and developing countries is largely inconsequential, because regardless of scale, CBNRM focuses on the interdependence of ecological, economic, and social factors.

Applications of Community-Based Natural Resource Management Projects

Applications of CBNRM are as diverse as the reasons for its inception. This is due to differing goals, resources, and socioeconomic, political or environmental circumstances that form the context in which a project is situated (Berkes & Seixas, 2004; and Kellert, et al. 2000). CBNRM has been implemented in the form of community wildlife management, community forest management, community watershed management, extractive reserves, integrated poverty alleviation and conservation initiatives, ecotourism, and others (Agrawal & Redford, 2006).

Community forest management (CFM) is one of the more prolific CBNRM strategies throughout the world. This is due to the recognition that forests are one of the most important yet threatened natural resources. Forests provide numerous ecosystem services, products for human consumption, and habitat for myriad species.

Unfortunately, deforestation has occurred at alarming scales and its effects are both local and global. Deforestation rates of tropical rainforests, for example, continue to rise and, rather than being afforested, former forests are converted for other land uses such as agriculture (FAO, 2008). Although forests provide economic and daily resources for humans, it is often more lucrative for people to grow cash crops instead of collecting non-timber forest products (NTFPs) or producing timber that may take years to grow after the first harvest (Olschewski, Tsharntke, Benìtez, Schwarze, & Klein, 2006). CFM is one attempt to reverse deforestation, and, by doing so, preserve ecological services and products that provide local communities with ways to secure livelihoods.

CFM has also grown in practice because centralized management of natural resources has often negated the rights of indigenous and local communities that once inhabited rural areas. For the most part, forests have been managed under the auspices of national agencies, often with the exclusion or outright removal of local people. Historically, local or indigenous peoples were viewed as threats to native biodiversity (Western & Wright, 1994), so the removal of local communities, especially in areas slated to become national parks, was often accepted by the urban public (Kijtewachakul et al., 2004; and Pandey & Yadama, 1990).

Consequently, the prohibition of local peoples from forests has resulted in many conflicts (Duaglamyai, 2001, cited in Kijtewachakul et al., 2004; and Redclift, 1993) and has often left conservation goals unsatisfied. Illegal extraction of both timber and NTFPs is common in many state-run conservation areas because locals rely on those resources for livelihood and subsistence but have been denied access to them. Local groups that may have historically managed natural resources have also been left with no incentive to

preserve them because management is viewed as the role of the government (Leach et al., 1999). Additionally, the removal of local peoples has also been committed in the economic interests of large corporations, especially those in the resource extraction industry (Alcorn, 1993), which do not necessarily have incentive to preserve biodiversity (e.g. Oteng-Kufuor, 2004).

The creation of national parks that excluded local groups was, as stated previously, an effort to protect native biodiversity that often conflicted with local needs or financial interests. However, there is evidence that local groups can play an important role in forest management for conservation. CFM has been initiated in many countries in order to give communities back property or access rights to land that were taken from them and to preserve biodiversity. Historically, indigenous peoples have regulated use in sections of forest for spiritual reasons. These areas are often restricted from all human activities except in religious or spiritual ceremonies. A study in India, for example, found that sacred groves maintained by communities had high biodiversity of native species (Murali et al., 2006). Forest areas managed by local communities for utilization also have been effective in maintaining native biodiversity. One study from Thailand argued that community-managed forests which provided resources for local needs were as biologically diverse, or even more so in some cases, than similar areas managed for conservation by state-run agencies (Kijtewachakul et al., 2004). The aforementioned study in India argues that biodiversity in community forest reserves was higher than in reserves managed by the state forest department (Murali et al., 2006).

Meeting the needs of rural people is an important aspect of CFM. It is in the interest of local communities, especially in developing countries, to managed forests

wisely because they often rely directly upon forests for subsistence and livelihood security. One way in which communities do this is by developing internal systems of rules to regulate extraction of timber, fuelwood, fodder, and NTFPs (Pandey & Yadama, 1990; Junkin, 2007; Murali, et al., 2006; and Pagdee, Kim, & Daugherty, 2006). These rules, regulations or other institutions are often determined by the communities via consensus and are enforced by the entire community, rather than by a few paid guards as is done in many state-managed forests (e.g. Murali et al., 2006). Established norms, once integrated into the local culture, may reduce vagrancy and alienate individuals who misuse resources from the rest of the community (Coleman, 1990, cited in Agrawal & Gibson, 1999). As a result, community enforced institutions[1] that govern forest management may be significant factors in helping meet the needs of locals while also preserving native species.

Conclusion

Community forest management, like other forms of CBRNM, is an approach aimed at preserving biodiversity and promoting social and economic development for local people. The success of such projects, however, is highly variable and is dependent upon multiple factors (Berkes & Seixas, 2004; Kellert et al., 2000; and Pagdee et al., 2006). Equitable distribution of benefits, for example, is a major issue in CBRNM because corruption is often involved (Kellert et al., 2000). In some cases, those with higher economic or social status monopolize projects and thus feel entitled to a larger share of benefits (Smith, Chhetri, & Regmi, 2003).

CBNRM is also based on some assumptions that do not necessarily apply to all situations. First, the assumption that communities are homogenous entities has been

[1] Institutions are established laws, practices, and customs.

criticized by various authors (e.g. Agrawal & Gibson, 1999; and Leach et al., 1999). Communities are quite variable and are arranged based upon not only physiogeographical structures, but the relationships between both internal and external actors, as well as across multiple scales, which involves regional, national, and global levels. Secondly, interactions between local groups and the environment are often fueled by external forces, especially as the world becomes more globalized (Berkes, 2004). Others argue that CBNRM has incongruous goals and that attempts to merge ecological and development interests should be eliminated (Redford & Sanderson, 2000).

In spite of its critics, CBNRM is growing in application. Any form of natural resource management will have its skeptics, but the debate and further investigations will serve to identify more effective strategies. Some authors argue that decentralization of natural resource management does not have to give full responsibility to local people. For example, projects with collaborative approaches between local communities, scientists, and state agencies have been successful in some cases (Berkes & Seixas, 2004; and Kijtewachakul et al., 2004). It is important to emphasize that CBNRM allows people to have a stake in their surrounding environments, which may give them more incentive to keep ecosystem health in mind when new development is proposed or when existing infrastructures are refurbished (e.g. Hibbard, 2006).

Although CBNRM has a long way to go, there are examples of successful projects that support its application. Community-based forest projects in Mexico, for example, have been praised for their efforts in meeting ecological and development goals (Bray, Merino-Perez, Negreros-Castillo, Segura-Warnholtz, Torres-Rojo, & Vester, 2003). The continued research regarding this management strategy in Mexico and other countries

will shed light upon its achievements and challenges and will further indicate the feasibility of this approach in the future. CBNRM is an initiative that tries to address some of the most pressing ecological, economic, social and scientific issues in contemporary global society. As the world becomes more globalized, natural resources will be subject to more human-caused strain. CBNRM is a way to promote a more harmonious relationship between humans and the environment, and in doing so, protect the Earth's capacity to support both human and non-human life.

Case Studies of Community-based Forest Management: Ghana, Mexico, and United States of America

Ghana

Introduction

Ghana is located in West Africa and gained its independence in 1957. Like many countries in Africa, Ghana faces serious environmental and social issues, namely poverty and deforestation (Wagner, 1993). Also synonymous with other developing countries, CFM in Ghana is an attempt to abate poverty and reduce forest degradation from human-caused events. CFM projects are more prevalent in Ghana as compared to many other African countries (Romano, 2007).

Historical Forest Management-Practices and Policies

Interest in CFM projects in Ghana has emerged because the country has experienced massive deforestation and continues to have a significant amount of people living below the poverty rate (i.e. less than US$1.00 per day). Deforestation, and poverty to some degree, has largely been blamed on the centralization of forest management by the national government in the post-colonial era (Kidane-Mariam, 2003; Leach et al., 1999; and Wagner & Cobbinah, 1993).

Centralized natural resource management, especially of forests, has been detrimental for the ecological health of state-owned, private and communal lands in Ghana. After independence, the Ghanaian government continued an approach to natural resource management that was similar to that of its colonial era, which was often exclusionary of local peoples and focused on commercial interests (Kidane-Mariam, 2003). For example, the national government codified policies to allow state management of timber extraction on all lands, which did not include local input and often

gave contracts to international logging firms (Wiggins, Markfo, & Anchirinah, 2004). The State Forest Department was also limited in staff, reducing its ability to enforce laws against illegal timber extraction (Kidane-Mariam, 2003 and Oteng-Kufuor, 2004). Even legal timber extraction by international firms was often quite unsustainable in Ghana. Prior to the Timber Resources Management Act of 1997, firms only received a one-time extraction permit and thus had no incentive to use sustainable harvesting techniques and the state often did little to encourage sustainable methods (Oteng-Kufuor, 2004). The creation of agroforestry operations, such as those for cocoa and palm oil, has also resulted in deforestation (Wiggins et al., 2004). As a result of mismanagement throughout the country, forest cover in Ghana fell from over 8.2 million hectares in 1900 to around 1.6 million hectares in 2003 (Frimpong, 2003, cited in Oteng-Kufuor, 2004), which is one of the highest rates of deforestation in the world (Wagner & Cobbinah, 1993; and WRI, 2003).

The mismanagement of forest resources has also impacted social and economic structures for local Ghanaians. At the time of its independence, Ghana was one of the most developed countries in Africa (Agyemang, 2000, cited in Kidane-Mariam, 2003), but it currently continues to have significant poverty rates (33.4 per cent of total population in 2005), especially in rural areas (World Bank, 2007). Many people in rural areas depend upon surrounding forest resources for their livelihood or as a supplement to income generating agricultural activities and subsistence farming (Dorm-Adzobu, Ampadu-Agyei, & Veit, 1991; and Oteng-Kufuor, 2004). The exclusionary approach to resource management, especially in forest reserves, prohibited local peoples the ability to access resources they rely upon for livelihood, such as fuelwood for cooking or NTFPs

(Oteng-Kufuor, 2004). Prior to 1997, it was also a common occurrence for timber extraction companies to gain permits to fell trees on private or communally owned properties without owner consent because the government legally owned all forest resources (Wiggins et al., 2004). When trees were felled on private or communal lands, the owner was not compensated for the loss (Wiggins, et al., 2004). Forest management policies that favored international logging firms also failed to generate income for local communities or even significant economic gain for the entire country because the raw timber was exported without having created many value-added products that generate more income (Oteng-Kufuor, 2004). Finally, the post-colonial history of centralized natural resource management degraded social institutions between local communities, increased local interest in commercialism, and changed their relationship to the surrounding environments (Leach et al., 1999).

Efforts Towards Community-based Forest Management

In the latter half of the 20th century, Ghana began to restructure its policies and practices in order to address the aforementioned social and environmental issues. In 1985, for example, the country began a process of political decentralization in various areas of its operation, including natural resource management (Kidane-Mariam, 2003). After the 1992 United Nations Earth Summit in Rio De Janeiro, Ghana, like many other countries, began to adopt integrated local-level sustainable development policies with social, economic, and ecological goals (Vordzorbge, 2006). An example of this is the 1994 Forest & Wildlife Policy Act, which was created to devolve more power to local communities for resource management and resulted in the creation of Community Forest Councils (CFCs) (Wiggins et al., 2004). In an effort to reduce deforestation and initiate

afforestation projects, the government passed the Timber Resources Management Act (TMRA) in 1997, which essentially aimed to reduce the number of logging firms with access to forests, dispel illegal chainsawing, and require logging firms to pay taxes and restore logged areas (Oteng-Kufuor, 2004).

In spite of these efforts, there is little evidence that, overall, devolution of forest management in Ghana has been effective in actually giving more autonomy to local groups. Many of the efforts to decentralize forest management have been nominal, and in large part the government retains control (Wiggins et al., 2004). The CFCs, for example, have lacked political clout and have no legal backing (Wiggins et al., 2004). Ghana's environmental policies have not been institutionalized at the local or regional levels, and are widely influenced by international development paradigms and residual colonial-era thinking that does not always coincide with local circumstances (Kidane-Mariam, 2003; and Leach et al., 1999). Additionally, some authors argue that community-level institutions in Ghana are highly degraded as a result of colonization and post-colonial policies that favor commercial and individual interests (Kidane-Mariam, 2003; Leach et al., 1999; and Wiggins et al., 2004).

Many of Ghana's decentralization efforts are also less associated with environmental issues than social or economics ones. The national sustainable development plans are an example of this discrepancy (Vordzorbge, 2006). Environmental policies, including those related to deforestation, in Ghana are prolific, but essentially exist only on paper because they lack enforcement (Wiggins et al., 2004). An

example of this is the TMRA's lack of efficacy in reducing illegal chainsawing[2]. It is noteworthy that a large majority of chainsaw operators are "locals" who were given little or no access to forest resources, which includes timber and NTFPs, and are seeking means to secure their livelihoods (Oteng-Kufuor, 2004; and Wiggins et al., 2004). According to one author, the TMRA was created to preserve private interests rather than public ones, essentially those of private milling firms who were loosing business due to excessive chainsaw operations that sold directly to domestic and foreign consumers instead of going through the milling stations (Oteng-Kufuor, 2004). In spite of arguments that Ghana has a high rate of CFM (e.g. Romano, 2007), few forests have been certified for sustainable practices. As of 2003, no forest in Ghana was certified by the Forest Stewardship Council[3] (WRI, 2003).

Unclear land tenure is another aspect that may limit CFM in Ghana. Land tenure rights are often muddled in protected reserves, private land, and even communal lands in Ghana. The former national law that allowed felling of trees on private and communal lands by external actors without owner consent is an example of this. Clear land tenure is an important aspect of CFM because the amount of users is often limited and users must abide by rules that govern resource extraction (Romano, 2007). Areas that have clear land tenure and solid institutions have been more successful, but these examples are few. One good example is the village of Goviefe-Agodom in the Volta Region. This village has created a successful and diversified agroforestry project and has done so with the

[2] Many of the chainsaw operations in Ghana split felled trees on site with their chainsaws, which reduces the amount of board feet per tree, resulting in more trees felled for the same amount of timber that a harvesting operation would cut (Oteng-Kufuor, 2004).

[3] Forest Stewardship Council is a private, non-profit organization based in Germany that "sets forth principles, criteria, and standards that span economic, social, and environmental concerns" and creates "standards (that) represent the world's strongest system for guiding forest management toward sustainable outcomes" (Forest Stewardship Council, 2008).

development of strong local institutions, equitable distribution of benefits, and clear land tenure rights on their communally managed and owned property (Dorm-Adzobu et al., 1991). Unfortunately, many villages in Ghana are less organized and lack the local institutions or regional/national backing to succeed with CFM projects.

Mexico

Introduction

Community-based forest management efforts in Mexico are some of the most widely known, revered, and researched natural resource management applications in the world. Mexico has been dubbed a model for CFM (Bray et al., 2003) with over 290 such projects throughout the entire country in both tropical and temperate forests (Alatorre, 2000, cited in Bray et al., 2003). In fact, the Forest Stewardship Council has certified 40 forests in Mexico, which ranks it 7th out of 79 countries for total number of sustainable forestry certifications (Forest Stewardship Council, 2008).

Historical forest management-practices and policies

The high rate of CFM projects in Mexico is a product of multiple factors and has been evolving since the Mexican Revolution of the early 1900s. The Mexican Revolution was largely an agrarian movement in which indigenous groups fought to regain land that was taken by the Spanish after colonization and split into large, privately owned ranches. The Constitution of 1917, a product of the Revolution, transferred land back to indigenous groups and communities, forming *ejidos* (community-managed tracts) and indigenous lands (managed by indigenous groups) (Bray, 2003; and Castillo, & Toledo, 2000). The result of this legal land redistribution is that approximately 80% of

forests and half of the total Mexican national territory are now under community management as either *ejidos* or indigenous lands (Bray, et al., 2003).

In spite of the development of *ejidos* and indigenous forests, community management of these areas was largely nominal for the first half of the 20th century. This is in part related to the Mexican government's issuance of private timber contracts on communal lands with relatively low input from the forest owners (Bray, 2003). In the 1970s, however, new reforms were instated to allow communities the ability to manage timber extraction, which gave them greater autonomy to administer forests for their own economic benefit and bring money into the community for social development projects (Castillo & Toledo, 2000; and Tucker, 2000).

Efforts Towards Community-based Forest Management

In relation to the social and economic goals which comprise CFM, Mexico's community managed forests hold great promise, and, in some cases, have been effective in meeting both. Many communities have been able to do this because of legal institutions that give clear tenure rights, collaboration with external actors for technical and logistical assistance, and strong local institutions.

However, ecological considerations for CFM projects in the country are highly variable because management goals differ significantly from community to community. Most of the management on these forests is related to timber extraction, with emphasis on volume and production rather than biodiversity or sustainability (Bray, 2003). On the other hand, satellite images of some community managed forests have shown an increase in forest cover (Bray, 2003). Another issue is the extraction of NTFPs, which is less easy to monitor than forest cover because it cannot be done using aerial images. The decline

of some species used for NTFPs have gained more recognition than others, such as those in the genus *Chamaedorea*, which have been harvested immensely as palm frond exports. Many communities, with the help of ecologists, are beginning to monitor extraction and change harvesting methods to sustain this NTFP resource (Ramirez 1997, cited in Castillo & Toledo, 2000). However, the attention to palm fronds, which are an economically important export, may not be synonymous with extraction of other NTFPs. Overall, the percentage of forests that are "well-managed may still be relatively small, but one indicator is that by March 2002, 502,656 hectares in 25 communities had been certified under criteria of the Forest Stewardship Council (Bray, 2003 page 675)".

Another indicator of CFM projects that have strong ecological elements is the designation of multiple-use sites. Many areas within community managed forests have been selected as biodiversity protection sites and some communities are doing more selective timber harvesting to reduce environmental impacts of logging (Bray, 2003). For example, one community in Oaxaca, Capulàlpam de Mendez, has designated 12,467 hectares for silviculture and the remaining 13,481 hectares for domestic use, recreation, and reserves (Tucker, 2000). On the other hand, smaller forests managed strictly for timber production are less likely to have areas designated for more sustainable use or non-extraction (Bray, 2003).

Collaboration between NGOs, research institutions, and communities has also benefited ecological health of many CFM project areas in Mexico. One study found that ecologists were more apt to meet their ecological goals if they conducted research in conjunction with the communities responsible for natural resource management (Castillo & Toledo, 2000). In Michoacán, the indigenous community of Nuevo San Juan

Parangaricutiro worked with researchers from the National Autonomous University of Mexico (UNAM) to form a management plan and currently has one of the best examples of sustainable forestry in the world (Castillo and Toledo, 2000). A national NGO, The National Union of Forest Community Organizers (NUFCO), has also been instrumental in helping communities meet ecological goals. NUFCO has over 500 *ejido* and community members and has goals related to economic incentives, technical assistance, and scientific information (Castillo & Toledo, 2000).

CFM projects in Mexico have also had economic and social benefits for members of rural communities. CFM has created jobs for people who may have otherwise left the area to look for work (Bray, 2003; and Tucker, 2000). Communities' ability to manage timber sales has also been instrumental in creating local sources of funds for community members and for social development projects (Bray, 2003). Unlike many CFM projects in other developing countries, Mexico has emphasized timber production rather than NTFPs, which is often more competitive in international markets (Bray, 2003). Capulàlpam de Mendez, Oaxaca, for example, prioritized production and was certified by Smartwood[4], so it has been able to compete in niche markets for green building supplies in the United States (Tucker, 2000). Capulàlpam also has used money gained from timber sales to develop infrastructure and engage in other community development projects (Tucker, 2000). Another example of CFM that has benefited the community in relation to economics and social welfare is El Balcòn in northern Mexico. This community has partnered with an American firm, Westwood Forest Products, which is urging the community to certify their forest as "green" in order to tap into the same niche

[4] Smartwood, like Forest Stewardship Council, certifies wood products that come from forests managed sustainably.

market for green building in the U.S. that Capulàlpam is targeting. El Balcòn has also helped secure jobs for the community and surrounding areas, with over 250 positions related to the CFM project (Bray, 2003).

United States of America

Introduction

CFM projects in the United States were not common until the 1990s, and instances of these approaches occur primarily in the Western states rather than in the East (Gray, 2007; McCarthy, 2005; and Steelman, 2002). Though inception of such management has roots in CFM of developing countries, projects in the U.S. are much less related to poverty alleviation (McCarthy, 2005). Interest in CFM in the U.S. is a product of several factors: biodiversity protection, land rights for indigenous groups, policy on publicly-managed tracts, and economics (Gray, 2007; Kellert et al., 2000; Little, 1996; McCarthy, 2005; and Steelman, 2002).

Historical forest management-practices and policies

Land tenure in the U.S. is largely of two camps: privately owned tracts and publicly managed tracts. Private lands are generally unregulated by state or national governing bodies, unless the site has federally listed species[5], or if practices on the site affect human or ecosystem health in negative ways. Public lands, on the other hand fall under the auspices of federal agencies (e.g. United States Forest Service, United States Fish and Wildlife Service, National Park Service, Bureau of Land Management, etc), state agencies (e.g. Wisconsin Department of Natural Resources, Florida Fish and Wildlife Conservation Commission), city, or county lands. Federally managed lands are funded largely by taxes and owned by all American citizens. However, land management

[5] Species listed under the federal Endangered Species Act (ESA).

decisions are often less related to public input of local communities and more a function of the managing agency's mission and site goals and federal policy.

The reasons for these two types of land tenure (i.e. privately owned and managed lands and publicly managed lands) in the U.S. is largely related to the way in which land was divided after colonization and then again after independence. After colonization public lands were sold or given to private landowners in what is now the eastern continental U.S. However, after acquiring the western continental states, large tracts of land remained in public ownership and management. Some authors argue that this shift in ownership policy, specifically related to natural resource management, was related to ideas that humans would degrade the environment and should be "removed" from some sites (Callicott, 2003; and McCarthy, 2005), though it may be attributed to other factors, such as economics. In any case, a large part of the western U.S. is owned and managed by public federal agencies, while the majority of the Eastern portions of the country are privately owned and managed.

Efforts Towards Community-based Forest Management

Many of the CFM projects in the U.S. have occurred on United States Forest Service (FS) lands. Timber production on national forests is an important part of local economies and funds generated from sales are used for education in rural areas. Logging of timber on all FS lands has curtailed significantly since the 1960s, largely in part of protests and lawsuits from private environmental firms (Little, 1996). The national drop in logging has impacted local economies that depend often solely upon timber harvesting and processing and for public education funds (Gray, 2007). Communities have also felt that a standardization of management practices across the country is insufficient for local

contexts (Scott, 1998, cited in McCarthy, 2005). As a result, local communities have urged the FS to allow more integration of local knowledge and concerns.

Legislation has been passed at the federal level to allow for more local collaboration into management of FS lands. The 1990 National Forest Dependent Rural Communities Economic Diversification Act, which continued with the Rural Community Assistance program, is an example of this (Voth, Jardon, McCauley, Moon, & Frenz, 1999, cited in McCarthy, 2005). The FS also created Resource Advisory Committees which allowed locals to advise management, and initiated several community forest groups in the West (e.g. Collaborative Stewardship Teams) (McCarthy, 2005). With such acts, the FS has arguably moved into a more inclusive approach to local communities, but the nature of their impact is questionable. These additions have increased local input, but not necessarily related to management, and also have forced agencies to increase their budgets because they have had to add positions to interact with the local groups (McCarthy, 2005).

One example of a community group that has received a lot of attention, but has not been able to change FS policy to a large degree is the Quincy Library Group (QLG) of Northern California. The QLG was established because the community was unhappy the management of three national forests in the region. The primary issues the group is concerned with include recovery efforts for the California spotted owl[6] (*Strix occidentalis occidentalis*), catastrophic wildfires, and an economic downturn from reduced logging practices (Steelman, 2002). Group members include loggers, environmentalists, and other local community members who decided that the FS was not managing land in the

[6] The California spotted owl a subspecies of the northern spotted owl (*Strix occidentalis caurina*), a federally endangered species which has been the subject of debate in the Pacific Northwest

interests of the surrounding communities. The QLG developed a management plan to preserve the needed old-growth pines for the owl, initiate sustainable8u timber harvesting, and conduct prescribed fires and reduce high fuel loads to lessen fire intensity for over one million acres in three national forests (Steelman, 2002). However, some national environmental groups opposed the group and movement towards a resolution has been caught up in red tape of the federal bureaucracy (Steelman, 2002). Other groups have faced similar challenges, which has been discouraging for communities who cannot compete with national level environmental groups or the federal legal processes (Little, 1996; and Steelman, 2002).

However, some CFM projects initiated for issues primarily related to biodiversity seem to have been more successful. Several university researchers and NGOs have emphasized CFM for increased biodiversity protection. This comes with the acknowledgement that species do not adhere to political boundaries, so management must extend beyond public lands and private conservation lands to private tracts (McCarthy, 2005). This approach also attempts to gain more involvement from local communities in protecting the country's natural heritage. The practice of creating federal or state wildlife reserves and wilderness areas that exclude humans has often led to a "culture of expectation", which relies upon government to care for non-human species rather than accepting responsibility as individuals and groups (Steelman, 2002). NGOs such as The Nature Conservancy and the Wildlife Conservation Society have collaborated with communities on such projects, and funding organizations like the Ford Foundation have provided money specifically for CFM projects (McCarthy, 2005).

CFM in the U.S. has also been implemented with indigenous groups and on indigenous lands. For example, the Menominee reservation, located in Wisconsin, has been hailed for its use of sustainable forestry methods and community collaboration (McCarthy, 2005). The Menominee have a long history of CFM on this site, whereas other projects have been initiated to give back land rights to indigenous tribes (Bray & Irvine, 1993). Many of the CFM projects on indigenous lands have been highly collaborative between the tribes and external agencies. The Nez Perce in Idaho, for example, have used geographic information systems technology and other tools commonly used by scientists on federal and state tracts to utilize sustainable management practices (Bray & Irvine, 1993).

Case Study Critique

What can be learned from the cases of Ghana, Mexico, and United States of America in relation to community-based natural resource management, and more specifically, community-based forest management? Although each case is unique, there are some similarities that can be gleaned from them to provide insight into the reasons why some efforts have been more successful than others in meeting ecological, economic, and social goals.

Land tenure is a common theme throughout each of the case studies and in examples from other countries. In Ghana, there is not a clearly defined and practiced set of rules that define how communities may access forest resources, especially in publicly managed tracts, which have been managed in a manner exclusive of local communities. This is confounded by the fact that, historically, the national government owned all trees and would sell rights to them even if they were located on private or communal property (Wiggins et al., 2004). Unclear tenure has led to illegal harvesting of timber and NTFPs because local peoples depend on these resources for subsistence and livelihood (Kidane-Mariam, 2003; Oteng-Kufuor, 2004; and Wiggins et al., 2004). Land tenure on some CFM lands in Mexico, on the other hand, is better established. The community of Capulàlpam, for example, has clearly defined access rights to forest resources for community members (Tucker, 2000). Land tenure in Mexico is also codified by federal laws that clearly give ownership, timber extraction and land management rights to communities with indigenous communal lands or *ejidos* (Bray, 2003; and Castillo, & Toledo, 2000). In the United States, land tenure is clearly divided by whether a tract is private or public. Private landowners decide who has access to their land; publicly

managed tracts are regulated by the mission of the managing agency[7] and other federal policies. Although enforcement of regulations related to land tenure in Mexico and the U.S. may be variable, unlike Ghana, they are codified in law. In this respect, some authors argue that clear land tenure is an important aspect of CFM because users are often limited and abide by rules that govern sustainable resource extraction (Romano, 2007).

Another important aspect of CFM illustrated by the three case studies and others throughout the world is the development of strong local institutions that govern management of community tracts. Mexico, in spite of a long history of colonial rule, has retained local institutions and utilizes them to enforce and manage community tracts for the benefit of the community (Bray, et al., 2003; Castillo & Toledo, 2000; and Tucker, 2000). The U.S. has more eroded local community institutions related to their ability to manage natural resources. This is in part because of long-standing laws that demarcate political boundaries (i.e. between public and private) and dictate who is responsible for management within those boundaries, as well as the inability of many local communities to access Congress in order to change federal laws (Steelman, 2002). Local institutions in Ghana are highly eroded as a result of colonial and post-colonial practices towards resource management (Dorm-Adzobu et al., 1991; and Leach et al., 1999). Although decentralization of natural resource management has been a focus in Ghana, it has not been in conjunction with the development of local institutions (Kidane-Mariam, 2003). Another aspect of local institutions that is important to mention is equitable distribution of benefits from the CFM project. If some local actors benefit more than others,

[7] On public lands indigenous groups often have legal rights to extract NTFPs if they are used for ceremonial events or other cultural practices.

communities may become disenchanted with the project and the established rules (Kellert et al., 2000; Murali et al., 2006; Pagdee et al., 2007; and Pandey et al., 1990). Many authors have emphasized that the absence of local institutions is one of the most limiting factors in CBNRM (e.g. Agrawal & Gibson, 1999; Berkes, 2004; Leach et al., 1999, Pagdee et al., 2007; and Pandey, 1990).

Another important aspect of CFM manifested by the three case studies, as well as other supporting literature is the important of cross-scale linkages between local communities, state and national governments, NGOs, and research institutions (e.g. Agrawal & Gibson, 1999; Berkes, 2004; Berkes & Seixas, 2004; Kellert et al., 2000). Local communities or indigenous groups may have the will or values to manage their surrounding environments, but this does not transfer automatically into sustainable management (Bray & Irvine, 1993). Communities in Mexico and U.S. have sought external assistance from scientists in order to conduct monitoring and establish best management practices (Castillo & Toledo, 2000; and McCarthy, 2005). Conversely, the Quincy Library Group in the U.S. was not able to make appropriate cross-scale linkages between themselves, national NGOs and the federal government in order to devolve more power to the community for management of surrounding national forests (McCarthy, 2005). In Ghana, it seems that CFM as a whole is mired by confusion between local, national, and international actors, especially in relation to recently created laws aimed at devolution of natural resource management and conflict between private and public interests (Vordzorbge, 2006; and Wiggins et al., 2004).

The relatively new field of sustainability science can inform multiple scale partnerships of CFM projects even more deeply because it focuses on interdisciplinary

collaboration (Kates et al., 2001; and Manual-Navarrete, Slocombe, & Mitchell, 2006). One community in Guatemala, for example, enlisted the assistance of economists to help them manage their fiscal resources in addition to assistance from scientists and land managers (Junkin, 2007). The collaboration between researchers and communities in Mexico and among NGOs and communities in the U.S. are good examples of multi-disciplinary approaches. Using information and knowledge from various sources is also an important component of building local capacity for sustainable management (Fagan, 1996). The ability of multiple actors working at various scales is yet another vital part of CFM because groups can work together to pool resources and knowledge as well as to build local capacity.

Clear land tenure, strong local institutions, and interdisciplinary, cross-scale linkages are all important components of CFM. Strong support at the national level is another important factor in communities' ability to manage their surrounding environments, as is the case in Mexico but not in the U.S. and Ghana. However, the literature related to CFM and CBNRM as a whole reveals that the effectiveness of these projects in highly variable and dependent upon many factors. For example, projects in Mexico, a country hailed as a model for sustainable forest management (Bray et al., 2003), are not ubiquitously successful. Some Mexican communities have nearly abandoned management of communal lands because of large-scale emigration to the U.S. and northern Mexico (e.g. Tucker, 2000). The struggle to compete in the global economy is also a significant factor for CFM because communities may suspend sustainable management in order to benefit from short-term economic gains created by timber or NTFP harvesting. Additionally, there are no guarantees that clear land tenure, strong

local institutions, federal support, or interdisciplinary multiple scale linkages will support CFM for the long term because paradigms related to resource management as well as local, national, and international contexts are all subject to change.

However, this does not mean that CFM and CBNRM do not exhibit strong promise as parts of more sustainable management of global natural resources. Community-based management certainly has its critics (e.g. Kellert et al., 2000), among them environmental groups who fear that local communities will favor economic interests over ecological health (Little, 1996; and Steelman, 2002). Like many ideological strategies, community based natural resource management is a fine balance between ecological, economic, and social elements that must act within a greater geopolitical context. A challenge is for communities to assess what will actually work for their local circumstances, but cases in Mexico manifest that this is possible if the national government supports community autonomy. In spite of criticisms, community based natural resource management projects are relatively nascent in the context of global political discourse, which means that each project has the ability to inform and guide the next. Therefore it is important that mistakes are taken as whole-heartedly as are successes.

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