

Comparative Analysis and Policy Recommendations on Developing Bamboo Resource Tenure Systems in Asia and Africa

Joint Project in Cooperation with INBAR and WFI



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Chapter 1: Introduction

With increasing public awareness of the need for forest protection, harvesting in natural forests has been restricted in many Asian and African countries. Facing demand for forest products from huge populations and income-generation requirements from forest dependant people, many countries are turning to non-timber forest products as a potential source of income to support rural livelihoods. In particular, bamboo has become a popular non-timber forest product. Bamboo is a critically important forest product used by rural communities in the developing world for food, building materials, cash income, furniture, and crafts. Bamboo has many advantageous properties. Bamboo grows much faster than timber, and requires less intensive management and expertise. It also naturally regenerates easily. Thus bamboo offers significant advantages to low-income rural communities with little access to investment capital or technology. Its potential to raise living standards is being recognized, with several countries working to find ways to utilize bamboo resources for sustainable development. The International Network for Bamboo and Rattan (INBAR) has taken a lead role in many of these global projects.

Despite economic promise, it remains a challenge for governments to create the necessary incentives for rural households and local private entities to participate in bamboo management. In many developing countries, bamboo is not considered a high priority produce, taking a secondary place after timber, long considered a high value commodity. Many governments have yet to recognise the potential of bamboo and there is a shortage of management expertise, processing know-how, financing and marketing information on bamboo. This perception of bamboo means that there is far less data on bamboo volume, production, sales, and tenure in most countries.

There is, however, growing recognition that tenure security with regards to the land base is a prerequisite for sustainable forest management. Without long-term security in their land, people will tend not to invest in managing their resources but will instead take what they can as soon as they can. This fact has been borne out time and again under various regimes, but most ostensibly in state-controlled systems where individuals and communities often lack even basic user rights to the forest and bamboo resources.

This report explores bamboo sector challenges and forest tenure issues in seven developing countries. Forest tenure is explored because in most countries there are no specific tenure systems for bamboo, which despite its importance to local livelihoods, has long been seen as a less important species than timber, which generates more revenue. Clearly there are important differences between timber and bamboo, but since bamboo is often found interspersed within timberlands, forest tenure policies are most relevant. The report finds that laying a foundation of adequate tenure user rights is critical to creating an environment in which public policy, the free market, and individuals can function most efficiently and effectively.

Information for this analysis was gathered from published reports, workshop proceedings, legal documents, interviews, and government regulations. Data limitation makes it

difficult to draw specific lessons from the experience of forestland and bamboo tenure reforms. The challenge facing policy makers is to build a better understanding of the key characteristics of successful tenure arrangements.

Chapter 2: China

China's forested area ranks fifth in the world, with forest resources covering 175 million ha, including 4.84 million ha of bamboo (2.86% of the total forestland). The state owns 42% of China's forestlands, with the remaining 58% owned by rural collectives (either owned by the township, village or sub village¹). Collective ownership dominates bamboo forests with 93.4% of the total bamboo forestland area or 4.52 million ha (SFA 2005). Thus studying bamboo tenure issues in China necessitates understanding how the collective land tenure system has evolved and the issues affecting collective tenure.

China's Bamboo Sector

China has the largest bamboo resources in the world, with between 300 to 500 species (Zhu et al. 1994). Bamboo occurs naturally in most of the country except in the very high mountains and the driest areas. Bamboo has two clearly differentiated uses in China: bamboo culms and bamboo shoots. Bamboo culms have special properties and are used in construction scaffolding, mats, handicrafts, furniture, and other forest products such as bamboo particle board, plybamboo, bamboo flooring, and pulp and paper. Bamboo shoots are a traditional edible vegetable considered a superior commodity by Asian consumers (Ruiz-Perez et al. 1999).

With a total of 4.84 million ha, China's bamboo forests are mainly distributed in southern China's ten provinces, including Fujian, Jiangxi, Zhejiang, Hunan, Sichuan, Guangxi, Anhui, Hubei, and Chongqing, where the climate and geographic conditions are favorable for timber plantations and bamboo forests. Half of the total bamboo forest is located in the first three provinces mentioned above. Over 70% of bamboo forests are naturally generated. The total area of natural bamboo forest is 3.19 million ha, while bamboo plantations cover an area of 1.65 million ha. Individually owned bamboo forests account for 2.03 million ha (42% of the total) and collectively owned bamboo forest is 2.49 million ha (51% of the total) (SFA 2005).

Bamboo has a long tradition in China as both a commercial and a subsistence-level product. It is making an increasingly large contribution to farmers' incomes and the prosperity of county level economies and therefore plays an important role in rural development. However, the importance of bamboo has long been ignored. It has been viewed as a minor forest product, receiving limited financial input, and no specific planning for bamboo development at national levels in China. Facing a shortage of timber supply after the adoption of logging bans in natural forests in 1998, bamboo development was finally recognized by the government as an ideal substitute for timber and potentially a tool for poverty alleviation. A senior officer at the State Forestry Administration said that by the year 2000, China would transform and establish its bamboo base up to 4

¹ Township, village and sub village are the local administrative authorities at present, with a different name respectively called as commune, production brigade, and production team before the rural economy reform took place.

million hectares, of which 3 million hectares would be transformed from the inferior bamboo forest and 1 million would be established as plantations (Liu 2001). Furthermore, the Ninth Five-Year Plan and 2010 Long-Term Plan for the Development of Forest Science and Technology included a key research project to improve technology for processing bamboo culms (Ruiz-Perez et al. 2001).

With rural economic reforms and market liberation, the bamboo sector has undergone great changes and become increasingly important. Although bamboo represents only about 3% of China's total forest area, it now contributes 25 percent of total forest exports. In 1999, the value of bamboo production amounted to \$1.47 billion and the value of the bamboo industry sector reached \$1.32 billion, with total exports of \$272 million in 1999 (SFA 2000). Anji, a mountainous county with abundant bamboo resources in Zhejiang Province, achieved great gains in bamboo development following rural economic reforms and land tenure reallocation. The county stands as an example (see box 1) of how political will and the introduction of market mechanisms can combine to elevate bamboo resources into a major tool for socio-economic development in terms of income generation and rural employment creation (Zhong et al. 1998).

Forestland Ownership Structure

Land tenure reform has always been a priority issue to the Chinese government for the sake of the stability of rural society and the well being of the farmers. Since collectivization under Communist rule in the 1950s, the government has enacted a series of land reforms intended to increase productivity while ensuring fairness. The results have not been particularly successful.

Forestland in China is either owned by the state (national government) or collectives. Private land ownership has not existed since the collectivization policy that began in the 1950s. However, land tenure reforms in the late 1970s shifted rural households, and thus individuals gained much greater control over management of forestlands, although legally the village collectives still owned the land.

The state forests own 68% of the total standing volume, but collectives own 58% of the forestland. Collectives dominate the area and volume of plantation forests, while state forests are primarily composed of natural forests (SFA 2005).

Table 1: Forest resources and ownership in 2005 (in million ha and million m³) (Lu et al. 2002)

Tenure	Area of forested land	Volume of total forests	Area and volume of forest stand				Area of economic forests	Area of bamboo forests
			Natural forest		Plantation			
			Area	Volume	Area	Volume		
State	63.89	7 641	62.01	7 124	7.70	378	1.59	0.29
Share (%)	42	68	48	71	26	37	8	7
Collective	89.75	3 665	67.19	2 961	21.44	635	18.63	3.93
Share (%)	58	32	52	29	74	63	92	93
Total	153.63	11 306	129.20	10 085	29.14	1 013	20.22	4.21

Forest Tenure Evolution

Land reform in China is a trade-off between social equality or equity and economic efficiency. Efforts to resolve these tenure issues have been explored by government, rural collectives, and farmers over the past two decades. Rebuilding public trust in the forest tenure security has been a priority as the country advances towards a freer open market system.

Forest tenure policy can be divided into two phases in terms of China's social-economic development. Following China's Communist Revolution in 1949, all individual land holdings were redistributed to farmers. In 1953, private lands were confiscated and merged into small-scale cooperatives that were managed under collective management. This collectivization of China's lands effectively ended all private production. The Cultural Revolution from 1966-1976 saw even further reductions in agricultural and forestry productivity, as collectivization resulted in tree theft, indiscriminate felling and widespread deforestation. Without any direct benefit for their labor, farmers had no incentive to increase productivity. In agriculture, this would eventually lead to famine. In forestry, farmers preferred to harvest and use the trees they had, rather than leave their fate to the vagaries of uncertain politics. As stated by Hanna et al. (1996): "Political uncertainty, not problems inherent in common property systems, created incentive to focus on current consumption at the expense of the future productivity."

The turning point in China's land tenure system came in 1978, when the government introduced the household responsibility system, essentially a family-based contract system. Since then, the household responsibility system has been the nationwide statutory pattern of agricultural land tenure. Under this system, collectives maintained land ownership, but contracted land management responsibilities to individual households. The households were required to sell a certain amount of produce back to the state at fixed prices. The system linked "remuneration with output" by allowing households to

keep any extra produce and to sell it at market price. The system generated incentives for production by giving farmers freedom of land use rights and decision-making, linking rewards closely with their performance. The early success of experiments with the household responsibility system in the agricultural sector led to its extension to the forestry sector. Under the household responsibility system, the forestry sector also saw big improvements in management and area planted. According to Xu et al. (2004) “by 1986, about 70 percent of the collective forests were contracted to farmers for management. The market was opened and timber production rose in tandem with prices. Plantation development appeared to multiply during the decollectivization of forests.”

Decollectivization and the introduction of the household responsibility system transformed what had been a uniform collective forest sector into a forest sector with diverse players: forest farms still under village collective management; forests managed jointly by collectives, farmers and/or state forest entities; forest parcels managed by farmers; and forest parcels managed by private companies (in contrast, state-owned forests continue to be under the jurisdiction of the state forest enterprises and forest farms).

In 1981, the state council issued a document with respect to forest tenure reconstruction called “Resolutions on the issues of forest protection and development” (also known as the “Three Fix” policy). The collectives were required to reallocate forestland to the individual households after three decades of unified management. The Three Fix Policy marked the beginning of a series of reforms intended to encourage private sector participation in forest lands by providing more secure resource user rights.

The Three Fix policy implemented a forestry household responsibility system. In order to meet the subsistence need for fuel wood supply, all the households in the village were entitled to the rights of barren land (called “private hills”), sized between 5 to 15 *mu* (1 ha is 15 *mu*) to plant trees, grasses, or bamboo. The household’s rights to the private hills were awarded permanently and could be inherited and transferred. Under the forest household responsibility system, villages or production teams contracted with households for undertaking forestry activities: raising saplings, planting trees, and managing existing forest on most collective degraded mountains and forested mountains. When the forest matured, the individual household, as the manager, and the production team, as the collective owner of the land, were to split the net proceeds from the sale of trees. The collective was to receive the smaller portion of the proceeds and the individual household (the labor) was to receive the larger portion (Grinspoon 2002).

There were three basic principles for contracting land management to individual households: even distribution of lands among farm households according to family size, transfer of use rights from the production team down to households, and maintenance of collective land ownership (Posterman and Hanstad 1993). The length of the contract leasing land out varied from 5 to 15 years.

Bamboo Tenure

Bamboo tenure is not treated separately from forest tenure, as bamboo may be grown in either forestlands or farmlands, and land tenure reforms have been the same for all land including croplands, forestlands and bamboo lands. Still, there are some slight differences in tenure arrangements among these lands, given the different role that each plays in safeguarding food security, environmental security and income security. For instance, according to the new law on land tenure (the Law on Leasing Rural Land 2002) the lease term of croplands is up to 30 years, while lease terms for forestland ranges from 30 to 70 years and could be longer with the approval from the State Forestry Administration.

Empirical evidence suggests that farmers have more confidence in managing bamboo forests than timber forests, as bamboo forests need less input, grow much faster (shorter rotations), are less risky and offer a more constant flow of cash (Liu 2001, Ruiz-Perez et al. 1999, Zhong et al. 1998). From the government's perspective, encouraging greater bamboo investment is important, especially to rural economies, since environmental restrictions have limited timber harvest in many forested areas.

The Chinese government's priority is to hasten the pace of ecosystem restoration, and thus while it would like to advance bamboo development, there has been no special emphasis on bamboo tenure reforms per se, but rather reform in overall forest tenure. Thus from the government's standpoint, reforming forestland tenure would also reform bamboo tenure, and thus examining the forest tenure regime is equally applicable to the bamboo tenure system.

Box 1: Anji's Success in Bamboo Development

Anji is home to a population of 443,800, of which 385,700 live in rural areas. Nearly 65% of Anji's total area of 118,692 ha is forested and about half of this, 57,315 ha, contains bamboo.

The adoption of the household responsibility system in the early 1980s ended 30 years of inefficient bamboo management under the collective system. With this land tenure reform, farmers were encouraged to lease collectively owned bamboo forests under contract. According to the contract, farmers were entitled to 15-year user rights to bamboo forests (later modified to 30 years) and were allowed to keep or sell the bamboo products after paying 5-10% of the lease fee. By 1994, 91% of the bamboo forests were allocated to farmer households on the basis of family size. With technical assistance from the local government, intensive bamboo management technology was introduced to farmers in order to improve the productivity of bamboo production. In 1994, 20% of bamboo was under intensive management. This resulted in an increase of net income about 8000 Yuan per hectare over the traditional management patterns.

Along with tenure reform, market reforms have been carried out in the bamboo marketing system. The state's monopoly of bamboo products purchasing and sales was abolished and there is now no restriction on bamboo sales. The introduction of the free market for bamboo created hundreds of trade units consisting of individual intermediaries, enterprises, and trade companies in Anji, which opened Anji's bamboo sector to larger domestic and international markets. In marketing, most raw bamboo traders are individual intermediaries whose trade volumes account for more than 80% of the total. Township and village enterprises lead in manufacturing. The main products are bamboo mats, handicrafts, plybamboo and board, bamboo shoots and bamboo brooms. Finished products are sold through two types of outlets: foreign trade companies whose trade volumes account for nearly half of the county's bamboo trade; and other traders (such as wholesalers, trading companies, retailers and enterprises) who deal in smaller quantities and deliver products directly to final consumers in domestic markets. In 1994, the export value of bamboo culms and shoots accounted for 44% and 62% of their total values respectively. Products are now shipped to Japan, Korea, and Southeast Asia.

The free market reform has also contributed to rapid growth in the number of bamboo-based enterprises. Anji's bamboo-based enterprises grew from 19 with 490 employees in 1975 to 527 enterprises with 10,700 employees in 1995, of which 61% percents are private enterprise. However, collectively owned enterprises and joint ventures dominate the bamboo processing industry in terms of output value and staff strength. Also, the data suggest that joint ventures achieve the highest marginal returns to labor while local private enterprises achieve the lowest.

Facing competition in the bamboo products market, the bamboo processing industry has shifted its product composition from the traditional products like farm tools, brooms and simple furniture to high value added products including new bamboo

mats, bamboo flooring, fresh bamboo shoots, bamboo plywood and bamboo board.

With the liberation of land holding and increased demand, farmers were given great incentive to manage their bamboo for high productivity. Changes in bamboo resources can be found both in terms of coverage and standing culms. Data provided by the Anji Forest Department showed that the total bamboo area grew from 45,466 ha in 1975 to 57,315 ha in 1994 with a 26% increase, and standing culms of Moso bamboo increased by more than 80% to reach 114 million, compared to only 62 million in 1957. At the same time, the density of standing culms has also grown dramatically with a 50% increase due to the adoption of intensified bamboo cultivation. Rural incomes increased dramatically, with rural per capita net income in Anji reaching 2,896 Yuan, an amount significantly higher than the state's average of 1,221 Yuan in 1994. Growth in bamboo income has significantly changed the economic well being of the people in Anji county. For example, rural homes have changed from simple dwellings to buildings with increased living space per person. Around 55% of households have a television or radio, and some have begun to use refrigerators and washing machines. Every village in Anji County has been equipped with a telephone. In 1994, even urban people hardly reached such a standard of living. Most farmers expressed their satisfaction with the household responsibility land tenure arrangement system, and their enthusiasm in managing bamboo forest resources. For instance, many farmers were willing to manage the bamboo forest instead of engaging in other businesses because techniques have improved, and higher returns are safeguarded. Data shows 92% of the rural households were willing to continue the contract for bamboo forest management after the current contract expires (Zhong et al. 1998).

Problems with Tenure Reforms

Despite the success of these tenure reforms, there remain some significant problems:

1. Farmers lack confidence in tenure security

Policies for forest tenure changed frequently in China from 1950-1980, causing a lack of confidence in farmers. The fear of uncertainty in tenure policy led to rampant deforestation when reform was first implemented in the collective forest areas between 1984 and 1988. For instance, household responsibility forestland fell by more than 20 percent after the readjustment of the forest tenure arrangement (Zhejiang Department of Forestry 1988). As Grinspoon illustrated (2002):

“Even if the government issues the certificate for the private hills to the farmers with the intent of increasing forest tenure security, farmers still fear another shift in policy. An older farmer still remembered the impressive property right title that was issued in the 1950 land reform and then nullified with the collectivization campaign in the late 1950s. Out of the fear of policy change, many farmers soon cut their trees and built wooden houses or made coffins as quickly as possible

after they obtained tenure to the private hills.”

Where tenure security has been greatest, in private plots of croplands and around homesteads, tree planting has been more successful.

During the 1980s, forest tenure reforms gave farmers a mere 5-15 years under management contracts for forests on hills. This relatively short contract length was too brief to provide tenure security, and instead encouraged extraction of timber and bamboo in order to guarantee maximum profit. Consequently, the quality of the forestland became very poor. Forestry is by nature a long-term endeavor and therefore long-term tenure is needed.

2. Inefficient management of collective owned or leased forestland

Farmers face a common problem of a lack of technology capacity and financing for forest management. Unlike agriculture, forestry is unlikely to generate income within a short time. Long periods of waiting time between harvest, continuous input, small land size, remote location and poor quality of the allocated land limit the farmers’ enthusiasm to take care of the forest (Lu et al. 2002, Liu 2001, Grinspoon 2002).

Tenure arrangement on a per capita basis not only brought income opportunities to farmers, but also led to fragmentation of forestland. In China, this situation is widely known as “one mountainous forest site with numerous owners” or “one owner with many mountainous plots.” The government, collectives, and farmer households tried several forms of management approaches to achieve a goal of management efficiency, including wasteland auctions and cooperative forest management.

3. Lack of transparency and effective oversight in the process of tenure arrangement

The power to allocate land use rights in rural China is largely concentrated in the hands of village leaders, creating opportunity for corruption and inequality. Many village leaders use their political advantage to allocate larger and higher quality plots of forestland to their families or friends.

With a lack of clear rules and supervision of political power, forest tenure reform actually increases opportunities for misappropriation. When transferability of forestland was introduced, it created new opportunities for rent seeking. Many secret deals are made between the local cadres and the local elites without the agreement of the village members. When these deals are revealed, strong protests from farmers emerge and shake the stability of the social order in forest dependent communities.

The Chinese legislature clearly recognizes that farmers’ land rights are being abused by local cadres—there are no less than 10 legal provisions stipulating the procedure relating to rural affairs and rural land contracting. But laws are only as good as their enforcement, and enforcement in China is admittedly weak due to insufficient financial support and trained labor. Once people with power or authority are aware that there is no effective

law enforcement, abuse of power becomes rampant. The central government must find ways to enforce the due process rights of farmers.

4. Lack of market information

With the increase of forestland transactions, collectives and farmers are often vulnerable to making poor land deals with forest industry corporations seeking a timber supply base. As the forest resource asset evaluation system is not yet established, the transaction prices offered by corporations are often far below their real value. Desperate for money to improve village roads, schools, and basic infrastructure, and needing to pay urgent bills, the collectives or the farmers are compelled to accept these bad deals. Not only are the rural communities left short-changed, but also management of these lands is more likely to be unsustainable.

Dealing with Inefficient Forest Management

Facing problems with forestland tenure regimes, the government worked out several solutions to address the major problems of inefficient forest management.

1. **Create short length contract to promote responsible management.** In 2002, China passed a new law on leasing rural land, which laid out several provisions on granting user rights to forestlands to farmer households for up to 70 years, protecting the legal rights to forestland held by farmers from being violated by any individuals and organization.
2. **Build an inter-oversight system to regulate the land allocation process.** The recently passed Villager's Committee Organization Law as well as the Law on Leasing Out Rural Land required village leaders to hold a meeting attended by all the households and to gain at least two-thirds agreement from the attendees to make any decisions regarding land allocation. Without such two-thirds agreement, any land allocations or transferability contracts can be revoked.
3. **Fasten the pace of the establishment of forest resources asset evaluation system.**
4. **Create new management approaches to achieve efficiency.** These include the wasteland auction model and the cooperative forest management model.

A) The Wasteland Auction Model

In 1993, a new forestland contract model emerged when, for the first time, the auctioning of barren forestlands was permitted (referred to as the "Four Wastelands" policy). This meant that wastelands could be sold through a public bidding process, thereby introducing a free market mechanism. The auctioning of wastelands was intended to promote afforestation and productivity of wastelands. As Lu et al. (2002) states:

“The growth in implementation of auctions, however, is less a result of the new legislation, than of a growing recognition of their advantages. Auctions are thought to counter problems of inefficient administrative land allocation and associated forest fragmentation by allocating use rights to the highest, and thus most efficient, bidder.”

The auction system introduced a new stakeholder into the collective forest tenure regime, namely non-collective members by allocating user rights to the highest bidder. By 1996, 3.8 million ha of “wasteland” had been auctioned (Ministry of Water Resources 1997). Since the passing of the Forest Law Amendment in 1998, the auction practice has been extended to lands with immature, middle-aged and mature forests.

The Four Wastelands policy, as well as several amendments following, also established the right to transfer forestland use rights. Transferability of forestland user rights has brought dramatic flexibility in forest resources allocation, effectively creating a market for user rights. Although not a direct sale of ownership, transferability of user rights enabled less capable and labor constrained farmers to shift their user rights to others who have the necessary skills and resources. In some cases, rights are being shifted back to collectives and state forest farms. This reform allows labor and capital to move where it is needed, thus improving allocation of resources. Forestland productivity increased significantly following this reform.

B) The Cooperative Forest Management Model

Deals between private corporations and collectives or farmers, as well as cooperative arrangements, became popular in the southern collective forest region. Each of these features is briefly explained below.

Deals between private corporations and collectives or farmers: Companies looking to secure raw material are interested in building long-term relationships with households or collectives to grow trees on their lands and then to sell the trees to the company. The company promises to provide technical assistance and capital input, and the household commits to selling their trees to the company in return for a secure market (Lu et al. 2002).

Cooperative arrangement: This kind of tenure arrangement does not involve outside capital and was first set up by a group of farmers in the early 1980s to cover the high costs resulting from managing fragmented forest plots. Since plots are usually too small to achieve economies of scale, this arrangement allows farmers to continue to manage their own land, but to also receive support services from their joint cooperative, such as fire prevention, technology assistance, road building, marketing and transportation. In return, farmers agree to pay a commission of 10% of their gross revenue to the cooperative (Lu et al. 2002).

These new tenure arrangements have had considerable success. Villagers see contracting out as an opportunity to raise income, and local authorities associate contracting out with higher levels of productivity, increased government revenues, and poverty alleviation. There has been a considerable increase in labor and capital input into forestry, new

employment opportunities created for poor farmers through afforestation and management activities, and environmental and agricultural conditions improved with the reduction of water and soil erosion (Liu 2001, Lu et al. 2002, Zhong et al. 1998).

Challenges Specific to China's Bamboo Development

China's land tenure reforms granting forest user rights to farmers has been very successful in generating greater productivity both on agricultural land and on bamboo stocks. Anji County's success in bamboo sector development shows the potential for other bamboo rich provinces. But with the exception of Zhejiang and Fujian provinces, the remaining 8 bamboo-rich southern provinces were not able to achieve the kind of success found in Anji.

Anji County succeeded in large part because it had strong bamboo demand in nearby markets and well-developed bamboo-based industry in town, which gave growers incentive to manage their bamboo better so they could sell the bamboo for a profit. Anji was well situated to take advantage of two of China's economic trade centers and two of China's most important bamboo export ports—Shanghai and Hangzhou—which meant that bamboo growers and processing industries had ready access to enormous market opportunities and lower costs in transportation. In turn, rapid development of bamboo processing enterprises and larger demand for bamboo raw material provided a necessary market to the farmers. When farmers saw stable income increases from bamboo management, they welcomed the tenure reforms, actively improving management techniques and treating the bamboo resources allocated to them as if it were their own. Market competition became active and contributed greatly to the innovation of bamboo products and its development into value-added products, which in turn created more revenue.

In other counties rich in bamboo resources, the development of bamboo has been hindered by the lack of industry demand for bamboo raw material, so that even when the government enacted reforms similar to Anji—for example, the lifting of bamboo price controls—the reforms did not result in increased bamboo development. Existing studies argue that the weakness of bamboo manufacturing in those areas was caused by the lack of marketing information, inferior product quality and low value added products (Hu 1997, Fu 1999, Chen 2002, Cao 1994). Because most bamboo-rich counties do not have easy access to marketing high cost value added products, the bamboo processing industry remains largely at the lower cost value added production cycle. For example, the bamboo produce value of Yunnan Province, located in the southwest, accounts for a mere 3% of that of Zhejiang Province, even though the bamboo area in the two provinces are nearly the same (Li and Lin 2004). Without the demand to drive bamboo growers, farmers see little incentive to put more labor, technology or money into improved bamboo management. This in turn results in poorer quality bamboo, which also has a negative effect on demand from manufacturers, who need a particular quality of raw bamboo material. In fact, most of China's bamboo resources are still under traditional management characterized more by extraction and less by input.

It is obvious that economic return from bamboo management has been viewed as a key factor by farmers before they start making any decisions in bamboo management and investment. If there are no markets that can bring economic benefit from selling their products, farmers will not invest in bamboo forests. That is, the level of management undertaken is determined by how much the growers can benefit from the sale of bamboo. How much farmers can benefit from bamboo growing depends in part on the kinds of products that are being produced by the bamboo industry.

In this sense, economic returns have overtaken tenure reform as the leading factor in encouraging bamboo development. Still, it was forestland tenure reform which in the first place gave farmers the rights to use and manage their lands independently from collectives. That is, tenure security formed the foundation on which an open free market was built, thus providing economic benefits to growers, manufacturers and consumers. Thus tenure security and economic incentives are of equal importance in the development of rural bamboo resources. It would be fair to say that market mechanisms need secure land tenure, and that land tenure reforms work best with the interaction of market mechanisms.

To address the lack of industry demand for bamboo raw material, there is a need to develop a stronger manufacturing base and an efficient system linking growers to processors and buyers. A stronger manufacturing base would increase technical know-how, production capacity and therefore demand. Better networking would strengthen the market signals to growers so that they know what kind of bamboo to grow and how much of it the industry needs.

The following recommendations may benefit bamboo marketing, growing, and processing:

- Create grower associations (or grower cooperatives): growers pool their resources to pay for more technical expertise, knowledge exchange, hiring loggers, forestry technicians, and also marketing representatives to negotiate bamboo prices with buyers. By pooling resources associations can offer greater output volume to buyers, and this gives them more negotiating power.
- Creating producer associations: allow producers to jointly pool funds and share marketing costs, reach more out of state and overseas markets, increase technical skills and manufacturing quality through industry standards and education programs.
- Put on government sponsored fairs to showcase the region's bamboo products to out-of-state buyers.
- Provide government sponsored, low interest loans to bamboo growers and manufacturers.

Summary

China lacks tenure legislation specific to bamboo, which falls under a more general land tenure system that includes agriculture and forestry. Land tenure reform has long been a priority for the Chinese government, which has sought to stabilize rural livelihoods. Looking at China's history of land tenure changes since the founding of the People's Republic of China, there have been a lot of ups and downs. The 1978 rural economic reform was widely accepted as a great success. It raised the incentive of the farmers to improve forest productivity by transferring forest management responsibility to farmers from what had been a state and collective-run farming system. There has been a considerable increase in labor and capital input into forestry and environmental and agricultural conditions improved with the reduction of water and soil erosion. Through each progressive land reform, it is clear that strong free market mechanisms are essential to provide incentives to farmers to invest in forests. At the same time, the rapid changes in land tenure have led to uncertainty amongst farmers, and they are vulnerable to being taken advantage of by corporate interests. While the central government has enacted tenure reform policies at a macro-level intended to improve rural livelihoods and productivity, at the micro-level farmers find these reforms are not benefiting parties equally. More attention must be paid to enforcing due process and the rule of law, and developing a more transparent system so that all constituents are aware of their rights and responsibilities.

Chapter 3: India

India is primarily a rural country with about three-quarters of its population residing in its 600,000 villages. Out of these, an estimated 170,000 villages with a total population of 147 million are located in the vicinity of forests (FSI 1999). A vast majority of the Indian population depends on forests for meeting basic needs of fuelwood, fodder, small timber for agricultural implements and house construction, food, and medicines. The dependence is greatest among the poor. In 1991, the poor officially totaled 253 million, or 30% of the population, and nearly four out of five poor live in rural areas. There is intense pressure on forests from large human and livestock populations directly dependent on this resource (Saigal et al. 2002).

The Bamboo Sector in India

India is second only to China in terms of the importance of bamboo, where natural bamboo forests are estimated to be 10.03 million ha. About two-thirds of the total bamboo area of the country is located in northeast India (Vaiphei 2005). Thirty-five percent of the total bamboo removed is used for making pulp, while housing and rural uses account for 20% each (Saigal et al. 2002).

Table 2: Growing stock of pure bamboo stands in India in 1980 and 1985 (in millions of air dry tonnes) (UNDP 2004)

	1980	1985
Undisturbed productive stands	5.3	5.2
Intensively managed productive stands	6.1	5.9
Logged-over productive stands	0.6	0.6
Total productive stands	12.0	11.7

The importance of bamboo in India can be gauged from the fact that it is often referred to as the “poor man’s timber,” “green gold,” or “the cradle-to-coffin timber.” Because of its many uses—including agricultural implements, handicrafts, construction material, as food, fodder and medicine—bamboo is in great demand throughout the country (ICFRE 1998).

The United Nations Development Programme (UNDP 2004) in a study on India’s cane and bamboo sector, states that:

“[India has] a very large standing resource of bamboo but most of this is in the forest areas where there is competition between the large-scale users such as paper and rayon mills and the local crafts persons. While there is a tradition in many parts of the country for small-scale homestead cultivation of bamboo for self-consumption, the commercial cultivation of bamboo is not normally found.”

Thus, currently the bamboo economy is largely unorganized, but it is an essential component of the subsistence economy of bamboo-dependent populations, and it is potentially a sector that can be industrially developed to provide expanded economic benefits.

It is estimated that India has utilized only a tenth of its bamboo-producing potential. The commercial consumption of bamboo globally is worth around \$10 billion, which is expected to reach \$20 billion by 2015. India's share of this global market is estimated at \$1 billion while China's share is currently the highest at \$5 billion.

Table 3: Consumption Pattern of Bamboo in India (Saigal et al. 2002)

Uses	Percentage consumption
Pulp	35.0
Housing	20.0
Non-residential	5.0
Rural Uses	20.0
Fuel	8.5
Packing including basket	5.0
Transportation	1.5
Furniture	1.0
Other wood working industries	1.0
Other including ladders, staff, mats etc.	3.0
Total	100.0

The Indian government believes that bamboo has great potential for generating employment. The government has created a \$115-million project to promote bamboo cultivation and trade through a “National Mission on Bamboo Trade and Technology Development.” The Mission aims to create 8.6 million jobs and to transition five million families across the poverty line. This is a national effort to make bamboo a key economic sector that hopes to generate employment, mitigate environmental degradation and expand India’s bamboo market to U.S. \$5.5 billion by 2015 (Vaiphei 2005).

In India, bamboo falls within forest tenure arrangements, since most bamboo is interspersed amongst forestlands. The national laws and policies regulating forest tenure apply to bamboo tenure (Kant 2001). However, the sale and trade of non-timber

forest products (NTFP) including bamboo are restricted in what amounts to a monopoly-like state-run system. The system is a major impediment to more equitable and effective bamboo management.

Most bamboo is located on government owned lands, although most success stories—in terms of bamboo quantity and quality—are on privately owned small-scale bamboo lands owned by communities, villages and individuals. The private sector has been successful because they have the incentive to grow bamboo for their own internal consumption, and after years of experience with bamboo growing naturally on their lands, they also have the technical expertise to manage the resource properly (J. S. Walia, personal communication, December 2005).

In contrast, on government lands, the government pays unskilled day laborers to manage 4-year rotations of bamboo. The village communities are not involved in the management of these bamboo stands, as they have little incentive to do so. As bamboo requires intensive management, the stands in government lands perform poorly compared to stands on privately managed lands (J. S. Walia, personal communication, December 2005).

Recognizing the need to make bamboo cultivation more attractive for farmers, especially on poorly managed state-owned lands, the government is trying to create a viable economic market for bamboo in communities that currently only harvest bamboo for local consumption. It is hoped that by developing external markets, secondary value processing of bamboo will follow and higher incomes can be attained. By making bamboo attractive for farmers to grow, it becomes a cash crop, thereby setting the foundation for a market infrastructure that will encourage commercial value processing. In addition, the agriculture ministry has been pressing the government to declare bamboo a horticulture crop (J. S. Walia, personal communication, December 2005).

Forestland Tenure and Management in India

Since bamboo tenure comes under general forest tenure, an examination of India's forest tenure and forest management problems is necessary to understand the impediments to sound bamboo management.

Government ownership of forests has been well established in both forest laws and policies since the period of colonial rule. More recently, governmental control has been further strengthened by the Forest Conservation Act (1980), which restricts changes in land use and transfer of ownership. With the amendment² of the 1988 Forest Act, the government restricted the role of the private sector on government forestlands, abolishing

² Sub-clause 2 (iii) of the Forest Conservation Act stipulates: any forest land or any portion thereof cannot be assigned by way of lease or similar arrangement, for any purpose whatsoever, including afforestation, to any private person or to any authority/ agency/ organization not wholly owned, managed and controlled by the government, without the prior approval of the central government; Sub-clause 2 (iv) of the Forest Conservation Act prohibits clearing of naturally grown trees in forest land for the purpose of using it for reforestation. The National Forest Policy also stresses that natural forest will not be made available to industries, whether for plantation or for other activities.

the system of leasing forests to industry for the harvest of timber and bamboo and effectively ending private corporate participation in either managing or using government-owned forestland (Saigal et al. 2002). Today, government forestlands are almost exclusively managed for ecological services and meeting community needs.

According to official estimates, 93% of India's forest area is controlled by the Forest Department and 4% by the Revenue Department. In contrast, 3% of India's forests are owned by private landowners—corporations, communities, and individuals. Corporate bodies and communities own 1.5% of the forests (ICFRE 1996). Most productive forestry is on private forestlands or non-forestlands (which may be either private or public).

Logging operations are carried out either by the State Forestry Departments (FDs) or Forest Development Corporations (FDCs) and the private sector has no role to play even in the development of scientific logging operations. These provisions virtually preclude transfer of ownership to or lease of government forestland by the private sector, and it is unlikely that these rights would be transferred to individuals, local communities or industry. However, while the private sector cannot expect to own government forests, local communities may qualify as managers and users. National policies affirm that forests should meet the biomass needs of tribal and other poor communities dependent on forests and also accept their involvement in management (Saigal et al. 2002). Hence, within the private sector, local communities alone are currently treated as stakeholders in managing government forests.

Private forests account for about 3% of India's forestlands. The use and management of these forestlands is governed, in most of the states where they exist, either by separate Private Forest Acts or by provisions in the State Forest Acts. Although different states have different provisions in their Acts, the restrictions placed on the owner regarding the transfer of private forest land and the use of private forests are relatively restrictive: in some states there are restrictions on transfer of land, whether by sale or lease; in other states, the owners must obtain permission to fell trees; and in some cases the state may even assume management if the owners are deemed not to be taking sufficient care of their forests. These restrictions tend to discourage private investment, since they undermine the tenure security of private forests. Transferable property rights are an important prerequisite for the economic use of land. The existing restrictions limit the effort and input provided by the owners to increase the productivity of these lands (Saigal et al. 2002).

India has undergone significant forest policy reforms in recent years, as part of its attempt to liberalize its economy, including a shift towards encouraging private sector participation in forestry. 1993 marked the passage of a new forest policy encouraging a more active role from the private sector in sourcing their own raw material, whilst the government focused on community development and poverty alleviation.

Left to find their own raw material, India's private industry now produces more than 90% of India's wood-based products. In 1998, the raw material shortage became more pronounced, when timber harvesting restrictions were passed. Farmers emerged as

important producers of wood, as companies contracted with farmers to grow wood on their lands. More than 50% of the wood supply is currently acquired from non-forest sources, mainly farmlands. Typically, farmers grow commercial tree crops on a part of their land. The rotation is generally less than ten years, and the produce—mainly timber and pulpwood—is usually sold to local traders, who supply it to various wood-processing industries (Saigal et al. 2002).

The policy shift to encourage the private sector to source its own raw material was a direct result of a new emphasis on using state forestlands for community development. In an attempt to get communities to play a greater role in the protection and management of government forests, the government introduced the Joint Forest Management (JFM) program. Around 63,000 community groups are protecting over 18% of forestlands under the JFM program (Saigal et al. 2002).

While the government still controls state forests, JFM was an attempt to engage local communities in forest protection and regeneration in return for receiving usufruct rights, a share in harvest income, and a role in the management of state forests. As 15% of the country's population resides in the close vicinity of forests and derives subsistence from them, local communities are greatly dependent on forests. The JFM program has spread throughout the country, and there are currently around 63,000 Forest Protection Committees (FPCs) in 27 states managing around 14 million ha of forest (Saigal et al. 2002).

While the local communities benefit from the initiatives of Joint Forest Management by sharing in the revenue or produce from the forest, **bamboo forestlands have not been brought under JFM.** In addition, the user right system in India tends to promote widespread overuse of forest resources. Individual households have no management rights on state-owned forestlands (Kant 2001). However, many households, in some villages, have user rights to the forest, such as rights to bamboo, timber, fuelwood, nuts, water and game. For example, someone who needs wood to build a home or a funeral pyre may own a right to a certain amount of timber from the forest for a set fee. These fees are ridiculously low because they have not changed since the rights were assigned during the colonial era. Thus the user rights system tends to encourage over harvesting since the market will pay much higher prices for the timber and other products than it actually costs the individual to obtain. Lack of regulatory manpower, and even corruption amongst forest guards, further exacerbates the problem. It is widely known that much of the state-owned forest is depleted but there are few accurate detailed inventories, since right holders rarely report how much produce they are really taking from the forest (J. S. Walia, personal communication, December 2005).

Problems with India's Current Forest Tenure System

1. Lack of tenure security

Nationalization of natural resources often raises the likelihood that the customary rights or participatory rights of local communities will be sidelined by the interests of the state. From the first Forest Act passed in 1865 to the new Forest Act of 1998, no rights have been granted to the forest dependent local communities. The 1988 forest policy emphasized meeting the needs of forest dependent communities, and was regarded as a turning point in favor of local communities. But there is no explicit provision on how to implement this change in policy, and it remains a non-statutory advisory statement issued by the government of India. This means that property rights remain vested with the state or the forest department, and the new granted rights based on an administrative order might be easily contested in court (Hazra 2002). The various schemes aimed at encouraging people to participate in forest management—even if they succeed in enlisting the support of the local inhabitants—cannot be a substitute for legal rights. Tenure security can be addressed only if the rights of the people are backed by the authority of law; otherwise, the government's new policies are simply talk.

2. Lack of full and equal rights

Proper forest management and improved productivity is only possible when the food, medicinal, fuel and fodder requirements of the local communities are met and this necessarily requires that they are involved in decision-making processes concerning the management of their local forests (Hazra 2002). Top-down managerial systems rarely achieve the full participation and cooperation of local inhabitants. Excluding the participation of local communities is a proven way to fail in forest management. The quality of the forest is drastically degraded and the conflicts between the local communities and the government are severe. Joint Forest Management only goes halfway in participatory forest management, as it limits community involvement and restricts it to areas of degraded lands.

Although JFM was touted as a major shift by the forest department to permit local involvement in management and sharing of forest produce, in fact it remains an unequal partnership between the government and local communities. Only degraded forests are being offered under JFM, and the rights can be taken away by the government at anytime. The Forestry Department can unilaterally cancel the JFM agreement if the local communities are perceived as violating any given condition. Furthermore, non-timber forest products, which are the most important produce for forest dependent people, do not fall with the provisions of JFM agreements (Hazra 2002).

3. Lack of free market mechanisms

In many states, the state government has what amounts to monopoly rights over the collection and sale of non-timber forest products (NTFPs), through either forest

departments, state-run forest development corporations, or designated agencies called LAMPS (Large Scale Adivasi Multi-Purpose Cooperative Societies) (Hazra 2002, Saigal et. al 2002). Additionally, under JFM, local communities are typically required to sell the produce collected from the state forest at a very low price back to the forestry department or licensed buyers (Hazra 2002). Because there is no free market for the sale of their forest produce, the products are sold far below their actual value. In a competitive and efficient market system, there should be a large number of buyers and sellers, whereas in India local communities can only sell their produce to a limited number of buyers permitted and approved by the Forestry Department (Hazra 2002). The purchase price is usually fixed by the state, which is advantageous to the Forestry Department but disadvantageous to the local community. In addition, forest communities consuming bamboo and other produce who have no access to the forest must buy the forest produce from the Forest Department at exorbitantly high rates. At times the bamboo prices offered by the state to the local consumers are higher than the prices sold to industrial units, which hurts indigenous artisans and handicraftsman (Kant 2001). This also means that since communities cannot use the harvested produce for themselves and are forced to sell the forest produce back to the state, the JFM system ignores the worth of these products to the subsistence livelihoods of these forest dependent communities.

The state's market monopoly over bamboo products tends to undervalue the produce and exploit the poor, regardless of whether the mechanism is through JFM controls or nationalization of NTFPs. As Khare et al. (2000) concludes, "instead of improving the access to and control over forest resources of the primary forest users—namely the poorest women and men dependent on forests for survival . . . JFM often reduces these further." There have been some recent national government exhortations to state forest departments to transfer these NTFP rights to forest communities, but naturally they have met resistance at the state level. Thus far only a handful of states have taken steps to relinquish some of its rights to revenue generated by NTFP sales (J. S. Walia, personal communication, December 2005).

India's Current Problems with Bamboo Development

India has the largest bamboo forest area in the world, but its share of the global market in terms of commercial sales is only one-fifth of China's, whose bamboo area is less than half of India's. This relatively small share of the global bamboo market is due to the scarcity of bamboo raw material supply, which limits the development of large scale bamboo based industries as well as small scale bamboo crafts. The lack of bamboo supply is the result of unreasonable bamboo tenure arrangement, a reflection of India's centrally controlled bamboo forestland ownership and management.

As mentioned earlier, the JFM program gives forest management rights to rural communities, but bamboo areas are usually excluded from this power sharing as JFM only covers degraded forestlands. Bamboo forestland does not fall under the degraded forestland categorization since most of the species of bamboo are clump forming, and only a few culms are harvested from a bamboo clump at one time. Forests containing

bamboo do not fall under the category of degraded forests even when the condition of bamboo clumps are poor due to past mismanagement (Kant 2001). That is, bamboo forestland still remains under the ownership of the government and is managed by the forestry department or state-owned forest companies. These state owned properties—including the bamboo—are managed inefficiently and unproductively. For example, in the central part of India, about 60% of bamboo on the state forestland is classified into lower productivity categories, which means there are less than 50 clumps of bamboo per hectare on the forestland (ICFRE 1998).

Although the 1988 Forest Policy emphasized meeting the subsistence needs of rural people, to whom bamboo is critical in their daily lives, the Indian government did not take real action in giving management rights to bamboo forest. Instead the government established a number of depots throughout the state to allocate a certain amount of bamboo at a fixed rate to meet the needs of rural communities. These depots, each having its designated jurisdiction covering several villages nearby, fail to meet the needs of the bamboo dependant rural people and craft workers, and in fact fuel the illegal harvesting of bamboo resources.

As seen in Kant's (2001) report, the open season for the depot is from October to June each year, and the supply of bamboo is only available from February to June. However the bamboo craft workers' peak market season is from October to November. Thus, the craftsmen have to purchase the fresh bamboo at a relatively high price from the contractor who provides money to the illicit cutter and buys bamboo from them. This lowers the profits that the craftsmen can make and puts them in an unstable raw material supply situation. Even during open season, the bamboo in the depot is often dry and not available in the needed quantities (Kant 2001). Thus depots are ineffective in both supplying the right bamboo and quantity. The rigid system of bamboo allocation through depots also brings a lot of inconveniences to the village people, who need the bamboo for subsistence use. According to a village level survey conducted by ICFRE (1998), between 27-70% of the villagers in four villages surveyed obtained the bamboo from the forest nearby through illegal cutting, with the rest buying bamboo from depots or markets. In addition, as stated by Kant (2001), prices for industrial units have always been lower than the prices for transitional consumers and sales from forest depots.

The lack of incentives for bamboo plantations largely restricts the development of the commercial bamboo sector in India. The 1988 Forest Policy ended the history of giving bamboo forest concession rights to pulp and paper industries in order to encourage them to grow bamboo plantations through collaboration with farmers. Since then, very little attention has been paid to improving the supply of raw material by encouraging growers to cultivate bamboo and rattan on private lands. This is in spite of the increased demand for better quality raw material to supply the bamboo and rattan based industry (Rawat 2001). The fact is, farmers are reluctant to develop bamboo plantations on their farmland and the village common land. As seen in a study carried out by ICFRE (1998), 80% farmers in the villages surveyed would rather plant bamboo at the homestead, in the bunds of farm land, and in wasteland than plant them in the common land. Although bamboo grows naturally in the wild and villagers use bamboo in their daily life, many of

them have no knowledge about its planting and propagation. Some farmers are worried that the shade of bamboo and the rapid spread of bamboo roots will have negative impacts on agricultural crop growth and reduce their crop productivity. Some farmers want to keep the common land as a rest space and for grazing cattle. In addition, in some state, harvested bamboo must be sold to the state depots at a fixed price. All these above impede the enthusiasms of farmers in the development of bamboo plantation. However, in an agroforestry system where each plant receives individual care, bamboo shows promising results. (Rawat 2001).

New National and State Level Strategies

In response to these impediments and a growing recognition that bamboo can play an important role in socio-economic development (Rawat 2001), the Indian government has taken some positive steps to enhance the development of bamboo.

The National Mission on Bamboo Technology and Trade Development was launched at the national level. As stated in its charter, the principal objectives of the Mission are to (DOAC 2005):

1. use bamboo development as an instrument of poverty alleviation and employment generation, particularly in the rural sector;
2. diversify, modernize and expand bamboo based industries through the application of modern technology and financial support; and
3. use bamboo as a means to achieve ecological security through plantation of quality species needed by the industry and the handicrafts sector.

The Mission is divided into 4 priority areas to cover the entire life cycle of bamboo: (a) Bamboo Research; (b) Plantation Development; (c) Post Felling Management and Bamboo Trade; and (d) Product Development, Processing and Value-addition of finished products.

At the provincial level, a number of states such as Mizoram (a state with abundant bamboo resources), have established their own Bamboo Development Agencies to develop and promote activities that encourage bamboo development. In Mizoram state, these activities include mapping bamboo resources, giving power to the village council to manage bamboo resources, regulating bamboo harvests, developing bamboo plantations, organizing bamboo trade organizations with linkages to bamboo growers and the bamboo processing industry, encouraging and promoting the establishment of bamboo enterprises, and disseminating market information and transferring management technology (GOM 2002). This new national bamboo policy is markedly changed from years past, when bamboo was considered a minor forest product compared to wood and therefore did not receive the kind of support from government as other forest resources. This led to neglect of bamboo resources. However, these new initiatives might end as the previously unsuccessful ones, if the current bamboo forestland tenure regime remains.

Recommendations

It is time for the government to review the current bamboo (i.e. forestland) tenure arrangement and make some changes to eliminate policies hindering the incentives for bamboo management and development. It is clear that state controlled bamboo management fails to achieve its intended goals. If the management rights to bamboo were allocated to farmers for a guaranteed period, they would be more motivated to invest in the bamboo resource and improve management in return for increased revenue. With sufficient raw material supply, bamboo processing industries and small craft workers will be more confident in making their business plans and spend more time in reducing production costs, improving product quality and making innovations. Hence, the monopoly of bamboo resources and markets is a major impediment to further developing India's bamboo sector in the international market.

The following recommendations may benefit bamboo marketing, growing, and processing:

- India's bamboo marketing system should be decentralised so that the government does not have a monopoly over collection, storage and sales of raw bamboo. Since state control tends to undervalue the produce, farmers should be able to receive better prices for their harvest, and bamboo processors should also benefit through better quality output.
- Further research is needed into the structure and functioning of bamboo markets, especially in Northeast India where much of the bamboo grows and many bamboo artisans are dependent on the resource for their livelihoods. The bamboo supply chain from the farmer to the craftman's workshop must be better clarified to understand the varying prices received by farmers and craftsmen. Studies on Manipur and Meghalaya indicate a complex picture of intermediation between the farmer/supplier and the craftsmen (Damodaran 2002). In some cases there are multiple middlemen between the farmer/supplier and the craftsmen, thus prices received by farmers and craftsmen can vary by 20-30 percent. Further complicating the market is the often wide fluctuations in raw bamboo prices experienced by craftsmen. The price changes are usually seasonal but since craftsmen are poor, they are usually only able to hold on to small stocks of raw material at any given time. Thus if prices swing up sharply, or the quality of the bamboo changes suddenly, they suffer the consequences disproportionately. Consequently, the ability of these craftsmen to turn out a consistent quality of bamboo products is constrained. These economic distortions are largely attributed to the supply chain and understanding these marketing channels thoroughly should yield important policy suggestions.
- Develop a reliable bamboo resource inventory, particularly on farmlands. While inventory surveys conducted by the Forest Survey of India are fairly reliable regarding bamboo stocks in forest areas, the data is less clear on bamboo in farmlands (Damodaran 2002).

Summary:

India has undergone significant forest policy reforms in recent years with its attempt to liberalize its economy and change inefficient state control of forest management. In 1988, the government of India shifted its key focus of promoting forest industry and extraction of natural resources towards a policy that was intended to give local communities greater participation in decision-making. Considering the large rural population dependent on forest and non-timber forest products, the policy shift was significant.

However, the reality of implementing this shift has been less impressive. The Joint Forest Management (JFM) program introduced by the government and touted as a major change to permit local involvement in the management and sharing of forest produce has yielded mixed results. Although JFM was intended to give more management control over forests to communities dependent on the forest, the reality is that the forest department continues to exercise sole legal authority and control over timber, bamboo and other non-timber forest products. Village groups organized under the JFM system lack legal authority and can be dissolved at any time by the forest department. JFM, without the active cooperation of local communities, is unlikely to achieve real reform. Since granting greater authority to communities necessarily entails a reduction in power by the state, it is not surprising that there has been bureaucratic resistance. Further, the JFM program is largely funded through foreign NGOs, a situation which does not lend itself well to long-term sustainability.

On a more positive note, the government has announced its intention to promote bamboo as a key forest product which can significantly raise the standard of living for many rural populations. It has set an ambitious goal to expand bamboo exports to the U.S. to \$5.5 billion by 2015. If India is to achieve this and other rural reforms, it will need to find the bureaucratic and political will to tackle community user rights seriously.

Chapter 4: The Philippines

The forest area of the Philippines is estimated to have declined from 12 million ha in 1960 to a current level of 5.8 million hectares. The Philippines has a large amount of forest dependent populations. Today, the number of upland dwellers is estimated to be as much as one third of the 75 million Filipinos or 25 million people. Of this, 6.3 million are indigenous people living in the forest (De La Paz 2000). The timber industry used to rank at the top of all other industries in terms of foreign exchange earnings. But as a result of unsustainable management, over harvesting, and extensive clearing of forests for agriculture, the Philippines went from being the world's biggest exporter of tropical hardwoods in the 1970s to being a net importer of forest products by the 1990s (FAO 2006).

The Bamboo Sector in the Philippines

Bamboo in the country is estimated to range from about 39,200 to 52,700 ha. It is physically distributed as follows: 58% (20,500 - 34,000 ha) in forest lands; 5% (2,236 ha) on government plantations; 7% (3,037 ha) in private plantations; and 30% (13,434 ha) from natural stands in private lands (i.e., natural bamboo stands growing sporadically or in patches in backyards and riverbanks within private lands) (BambooNet 2003). This means that nearly 90% of bamboo is natural stands and have not been managed intensively. There are now 62 bamboo species growing in the Philippines, of which only 21 species are endemic, and only ten are considered commercially important (PCARRD 2002).

Bamboo has been widely used by the local people. It is used by most rural households for fencing, simple furniture, agriculture implements, and simple household tools (Kessler 2003). Bamboo products are sold in both domestic and export markets. High quality products are sold in high-end market (e.g. hotels, restaurants, condominiums and residential houses) while those of lower quality are sold to lower and medium- income consumers. The local furniture and handicraft industries use around 40% of the total raw production, while the fishing, housing, and construction sectors use around 25% of total raw production. The vegetable and fruit industries that need crates and props use around 10% (PCARRD 2002).

Table 4: Consumption pattern of bamboo in the Philippines (PCARRD 2002)

Uses	Percentage consumption
Furniture and handicraft	40
Fishpen, housing, and construction	25
Props and crates for fruit industries	10
Other	25
Total	100

Although bamboo furniture and handicrafts are mainly produced for the domestic market, they have made a great contribution to foreign exchange earnings in the past ten years. Statistics from the Bamboo Information Network (BambooNet 2003) shows that the total export of bamboo furniture alone was valued at USD \$3.18 million in 2000, accounting for 1% of the total furniture exports (USD \$381 million). These exports went to more than 50 countries (BambooNet 2003). Baskets made from bamboo and rattan accounted for 30% of the total housewares exports (PCARRD 2002).

Table 5: The Philippines Bamboo Furniture Export (1991-2000) (PCARRD 2002)

Year	Value (FOB Value in millions of \$USD)
1991	1.83
1992	1.84
1993	1.40
1994	1.22
1995	1.51
1996	1.67
1997	1.78
1998	1.90
1999	2.67
2000	3.18
AVERAGE	1.90

Table 6: The Philippines Handicraft Exports (1991-2000) (PCARRD 2002)

Year	Value (FOB Value in millions of \$USD)
1991	336.96
1992	391.70
1993	402.04
1994	435.30
1995	461.14
1996	486.33
1997	473.88
1998	448.88
1999	464.31
2000	448.82
Average	436.94

The Philippine government gave institutional support in the development of the bamboo industry since 1956, but it is commonly acknowledged that the bamboo processing industry remains the small cottage scale industries and that not many value added products are generated (Estremera 2004, Singh et al. 2000).

Evolution of the Philippines' Forest Tenure Regime

The evolution of forest tenure in the Philippines can be divided into two periods: 1) the colonial period in the early 1980s with high central control and 2) the post-Fernando Marcos Administration with decentralization of forest control and community involvement of forest management.

State control of forestlands and forest resources was established by the Spanish colonial administration in the 1500s. Prior to that, land ownership was generally communal. Forests were free for public access and "ownership" was vested in whoever cleared and cultivated the land first (Pulhin and Dizon 2003). When the United States took over occupation of the Philippine islands, they continued the idea of maintaining state-controlled management of forest resources. Under colonial rule, long-term investment in the Philippine forests took a back seat to short-term profit-seeking from extraction of natural resources.

After the Philippines gained independence, state control of forest resources was stipulated in the Constitution, and forest policy did not change much except for the fact that even greater emphasis was placed on the production of timber to fuel economic development. Concessions became a traditional forest management approach whereby the state assigned large-scale forestlands to timber corporations. After Marcos took over in 1965,

the logging business grew as timber licenses proliferated. The licensed area doubled from 4.48 million hectares in 1959 to 10.59 million hectares in 1971, reaching one-third of the country's total land area. This situation continued from 1971 to 1977 (Gould 2002). Logging occurred without much concern for any future harvest from the forest. During this period, deforestation was estimated at a rate of 200,000 to 250,000 ha per year (De La Paz 2000).

In the post-Marco era, with environmental degradation and poverty posing severe problems, the government recognized the importance of shifting its forest management direction from an industry-oriented system controlled by a select few, to a community-based forest management system. Furthermore, the government reached the pragmatic realization that the ultimate survival of the Philippine forests lay in the hands of millions of small holders (Pulhin and Dizon 2003). To implement policy reform, a number of social and community forestry programs and projects were established by the government, including the: Forest Occupancy Management (1975), Family Approach to Reforestation (1976), Communal Tree Farming (1978), Integrated Social Forestry Program (1980), National Forestry Program (1987), and Community Based Forest Management Program (1995). As a result, several types of tenure arrangements emerged after 1975. For example, the Community Based Forest Management Agreement (CBFMA) entitles forest communities to use and develop forest lands for a duration of 25 years, renewable to 50 years. In upland areas, occupancy is legitimized through the issuance of Certificates of Stewardship Contracts (CSC), which grant a 25-year long tenure, renewable to 50 years. The grantees can receive assistance in agroforestry development and are encouraged to plant trees on at least 20% of the land they occupy. Licenses to exploit natural forests are covered by 25-year Timber Lease Agreements which include the requirement to reforest some areas following harvest for a subsequent crop from the land. Certificates of Ancestral Land confer significant administrative and management rights to the indigenous community (Pulhin and Dizon 2003).

In 1995 the government adopted Community-Based Forest Management (CBFM) as the national strategy to achieve sustainable forestry and social justice in the Philippines' forestlands. With this development, all the existing people-oriented forestry programs and projects were unified under an umbrella program termed the CBFM Program (Pulhin and Dizon 2003). At the heart of this program is tenure reform that provides 25-year security to participating upland communities renewable for an additional 25 years. Through the issuance of land tenure instruments called Community-Based Forest Management Agreements (CBFMA), communities may also be allowed to commercially utilize timber from second growth forests, a privilege previously given only to a select few - the holders of the timber license agreements that belong to the elite sector of the society.

As the policy shifted to CBFMA, the area under corporate logging gradually declined to the present 1.4 million hectares, as the government cancelled licenses and did not renew expired licenses (Gould 2002). The Department of Environment and Natural Resources Strategic Action Plan for CBFMA envisions that 9 million hectares of the country's total

forestland of 15.8 million hectares will be placed under community management by the year 2008 (Pulhin and Dizon 2003, De La Paz 2000, Gould 2002).

Problems with the Philippines' Forest Tenure Regime

Despite these reforms towards community forest management, there are still problems with the forest tenure system in the Philippines:

1. Lack of stability of forest policies

Frequent changes in forest management programs and policies are destabilizing to the Philippine's forest tenure arrangement. When there is a new government power, some new forest policies will be created. Since the late 1970s, numerous forest programs, such as the Forest Occupancy Management (1975), the Family Approach to Reforestation (1976), and the Communal Tree Farming (1978) programs emerged, emphasizing the involvement of individual and upland communities in forest management. Unfortunately, these frequent changes create uncertainty and confusion among participants. As De La Paz (2000) points out, "Many project sites and communities were not adequately informed about the terms and conditions of the National Forestry Program for their participation. This resulted in overlaps with the Integrated Social Forestry Program³ (ISFP) projects, and confusion over who would own the trees after reforestation." This lack of stability and clarity can itself contribute to the continuing forest degradation situation, even though these programs were attempts to increase community involvement.

2. Lack of credibility of the government

The Department of Environment and Natural Resources (DENR) is the main agent in making forest policy but has earned a reputation for renegeing on promises during the implementation of reforestation contracts. Delayed payments, incomplete payments, poor quality of planting materials, and lack of instruction on how to do tree planting have resulted in farmers distrusting the DENR. As farmers became dissatisfied with their payments, they felt cheated and felt that they were "unpaid laborers of government." In many instances, "reforested" areas were set on fire as a form of protest. Other areas were burned to cover up the fact that the specified number of seedlings per hectare were not planted (De La Paz 2000). Thus, effective policy reform must necessarily include reform of DENR itself.

3. Lack of incentives for forestland users

Local communities lost interest in proper forest management when they realized that the costs and responsibilities for forest restoration would be largely borne by them and that these costs exceeded the benefits they could get from the degraded forests assigned to them. A famous motto of the Community Forestry Program is "Giving the forest back to

³ ISFP was initially implemented in 1982, granted rights to manage a portion of forestlands to individuals and communities who were actually residing inside forestlands De La Paz (2000).

the people.” However, the main question that needs addressed is “Do the people really benefit from the forests?” As Pulhin and Dizon (2003) stated:

Most of the forests assigned to the people through various tenure arrangements are poorly stocked if not marginal, and some CBFMA areas contain old growth forests which have been declared as protected forests and hence are not available for commercial utilization. Similarly, in cases where well-stocked secondary forests are available, these cannot be readily harvested considering the tedious requirements for the approval of a Resource Use Plan. In essence, what are actually given back to the people are the tasks of forest rehabilitation and protection without the benefits that should accrue from responsible management.

4. Lack of longevity of the forest management programs

Almost all the initiatives involved in community forestry programs were largely supported with funding from international donors. In the immediate post-Marco period, international aid flooded the country, as international donors were eager to support the new Philippine democracy. Today foreign aid for community-based programs has been declining. At the same time, the DENR significantly reduced funding to the programs as more funds were shifted to mining, which has emerged as a new industry and is being encouraged by the government to attract more foreign corporations to invest in mining exploration in forests (De La Paz 2000). Although there were no pronouncements nullifying CBFMA as the national strategy for forest management, it is difficult for the program to achieve its expected objective with the decline in fiscal support. This heavy reliance on international aid is a common failure of many forestry programs in other developing countries as it leaves the countries vulnerable to shifting aid flows. This is another reason why it is important to develop market mechanisms which will provide real incentives for people to manage forest and bamboo lands in a more sustainable manner, rather than relying on continued government support.

Problems with Bamboo Sector Development in the Philippines

Despite recently acknowledging the potential of bamboo to alleviate poverty and wood shortages, little developmental activity has focused on bamboo in the Philippines. One of the few successes had been the bamboo panel processing initiated by the Inhand Abra Foundation⁴, which demonstrated great potential in bamboo development at the

⁴ InHand Abra Foundation was formed by a group of local individuals in the late 1980s. Together, they began a project intended to augment the bamboo industry and increase the livelihoods of those involved in bamboo craft production. A plybamboo factory was established from which boards were sold for use in architectural design, and from which high quality furniture pieces for export were produced. The factory had a solid start, achieving sales of P503,424 pesos in 1991 and P1.95 million in 1993, and directly and indirectly employed over 200 people. Unfortunately, Abra was then hit by a major earthquake causing destruction to the roads which enabled easy access to raw materials, and also caused the bamboo to flower and die. Abra was next hit with a typhoon which severely damaged the factory structure. Despite

community level with assistance from special groups (Singh et al. 2000). Unfortunately, a major earthquake later caused serious damage to the surrounding infrastructure and the project was not restarted. On the research front, the Philippines has conducted a substantial amount of bamboo research, including developing seed technologies and propagation techniques; determining species-site compatibility; improving growth, yield, harvesting, and management, and studying production economics (PCARRD 2002). However, there are still several constraints impeding bamboo development in the Philippines.

Scarcity of bamboo raw material in and around bamboo processing areas is the main constraint facing bamboo processing producers. The government's control of bamboo resources exacerbates the shortage. As 88% of bamboo forest is under government control, there is no free access to this bamboo resource for producers. In addition, most of the craftsmen are tenants who do not own their own land, and must therefore purchase the bamboo from government forests. In contrast to craftsmen in China who own a certain amount of bamboo forest and have stable raw material supply, the craftsmen in the Philippines have to pay more to obtain raw bamboo material, including the cost of purchase, transportation and government charges. It has been reported that some producers have to walk 20 km to acquire their bamboo material and have to pay the transportation cost (Kessler 2003). These costs have considerable consequences for householders producing bamboo products, as their profit from bamboo products was already very low.

Farmers lack incentives to establish bamboo. On the supply side, bamboo craftsmen face high bamboo costs, making their final product less price competitive; on the demand side the market prices at which they can sell their bamboo products—which are typically of low quality—are very low at the farm gate. The result is that bamboo often does not present a good option for income generation (Kessler 2003).

Gaps between bamboo research output and applied technology hinder the growth of the bamboo industry. Although there is extensive research on bamboo production, processing, and utilization conducted by agencies, universities, and training institutions, very little has actually been applied in the field. Growers and producers lack technical skills, as there is a low rate of adoption of developed farm-level and post-harvest technologies, particularly harvesting regimes, treatment, and storage because they are not widely promoted (PCARRD 2002). The lower quality of raw material in turn results in inferior bamboo products. As stated by Palisoc et al. (1996):

...technical information and technology transfer services often reach only the more accessible and progressive entrepreneurs. Such information and services are seldom disseminated to the smaller furniture firms. While a few, bigger and progressive firms continue to advance; the majority is left behind with their

this devastation, the support direly needed to save what had been started was not forthcoming, nor has there been any initiative to spearhead other economic development in the area. Today in Abra there are still no major industries and therefore, little by way of economic opportunity for those living in the province (Singh et al. 2000).

traditional, if not antiquated, techniques and processes. The gap is so wide that 90% of the 4000 to 5000 furniture producers belong to the backyard type characterized by inadequate capital, limited facilities and poor managerial and technical skills.

The bamboo processing industry is still in its infancy. Although bamboo products exports are increasing, most of the exported products are low cost value added products. The quality of bamboo products is not of the level that buyers desire, and the bamboo industries are unorganized. Most are small-scale backyard cottage industries due to a lack of capital. The industry lacks creativity and variety in product designs. Although bamboo products are more diversified now, most bamboo manufacturers still limit themselves to the traditional uses and designs of bamboo products especially for the products intended for low-end markets (PCARRD 2002). As Estremera (2004) states:

The bamboo processing industry has been in existence for quite sometime. However, this sector's influence in the country's economic development has been, at best marginal. The BambooNet noted that the bamboo industry in the country generally caters to agricultural requirements like fish pens, banana props, and other low-value applications like scaffoldings and fences. The bamboo processing industry, on the other hand, is at best very small and thinly spread across the archipelago.

The current forestland tenure reforms in the Philippines remain largely on paper. Although a lot of research has been done on bamboo development, there is a lack of updated and comprehensive data on the extent and geographic distribution of existing bamboo stands in the country. This implies that the government did not prioritize development of the bamboo sector despite having written a "Master Plan for Bamboo Development." Furthermore, although new forest management programs such as the Community-Based Forest Management and the Ancestral Domains emphasized "giving forests back to people," most of these programs are in their experimental stage and the results are not yet clear. Without reform of the state's control over bamboo resources there is no possibility for the rapid development of bamboo plantations or good management of remnant natural bamboo forest.

Recommendations:

It is reported that commitment to bamboo development can be found at the local government level (Kessler 2003). However, the willingness of development itself cannot function well without the interaction of other key factors.

The following recommendations may help address the problems facing bamboo development in the Philippines:

- Strengthen the existing Community Based Management Program and extend it to bamboo management. Given the inefficiency of protection and management of

bamboo resources by the government and the high costs incurred by craftsmen, the government should grant bamboo forests to local communities or local people to manage, so as to bridge the gap between supply and demand of bamboo raw material. As Singh et al. (2000) stated “ if people had a piece of land to cultivate, especially land adjacent to their homes, less time and efforts could be spent harvesting and transporting the materials and more time managing the production of their crafts.”

- Encourage the establishment of bamboo plantations. Plantations should be established in and around the processing villages with financial assistant from the government to meet demand and lower the costs of raw material access and transport. If there is no need to worry about the material supply, producers are more likely to focus on product innovation and quality improvement.
- Strengthen technology transfer services. Both growers and producers are far behind the existing advanced technology on bamboo management and bamboo processing. The government should establish bamboo demonstration plots in and near bamboo cultivation sites and provide technical extension agents to disseminate applied research on bamboo propagation, maintenance, and harvest techniques. At the same time, the state should work closely with NGOs such as INBAR to upgrade the quality of bamboo products through accessible workshops and training.
- Form regional and national associations/societies that can look after the interest of the bamboo industry. The societies can organize training and trade fairs, advance the diversity of bamboo products for export markets, establish bamboo products quality standards, unite household producers into a medium scale cooperatives, lobby for policy reforms, and provide marketing and production information.
- There should be a specific bamboo development authority at the central government level, which would be in charge of making a nation-wide bamboo development plan. The plan should include:
 - Government financial aid to provide investment capital to farmers and manufacturers
 - Ways to bridge the gap between abundant research outcome and lack of technical know how facing the lower ended participants
 - Support to manufacturers and associations to expand export markets and provide marketing information.

Summary

The Philippine government is taking steps to move forward on tenure reform by promoting the involvement of the community, and although the results are still unclear, at least the government has shown a willingness to address the issue. However, the process of reform has led to frequent changes in forest management policies, leading to distrust of

the government and a loss of incentive in active forest management by rural communities. It is critical for the government to inform farmers about plans for reforms and to invest in capacity building that can provide technical and financial assistance to farmers. Otherwise, forest reforms will have little effect if the government makes policy shifts without concurrent technical assistance to bring farmers up to speed. It is also imperative that the government relinquish its control over the bamboo sector so that farmers can manage their own bamboo resources and have easier access to raw material. This will also allow bamboo prices to more efficiently reflect demand and supply, and provide greater benefits to growers and manufacturers.

Chapter 5: Indonesia

Indonesia is a heavily forested country, with nearly 60% forest cover. The forests are very diverse and represent about 10% of the world's tropical forests (FAO 2006). The archipelago is well known not only for its extraordinary biodiversity and productivity of its forests, but also for high rates of deforestation and illegal logging, catastrophic fires, and social tensions over forest rights between the government and indigenous and local communities (Hermosilla and Fay 2005).

Indonesia's Bamboo Resources

Bamboo is found in natural forests, plantation forests, and in community forest areas in many villages of Indonesia. There is no national inventory data available on bamboo coverage, although some estimate that there are more than 5 million ha of natural bamboo forest areas in Indonesia. Bamboo is critical to rural livelihoods, and it is cultivated in the backyards of many peoples' homes. It is also used in the production of handicrafts and furniture (Kartodihardjo 1999).

Much of Indonesia's natural bamboo forests are in protected areas and national parks, but these are often exploited by businesses that pay local people to collect bamboo from the forests without a permit (Widjaja 1998).

Indonesia has a small bamboo industry producing chopsticks, toothpicks, paper, and furniture and aska board. There were two paper mills using bamboo as raw material in east Java and South Sulawesi in the late 1960s. However, in the 1970s, the paper mills were forced to use wood because bamboo production from forests decreased tremendously (Joedodibroto and Sugiharto 1995).

Traditionally, bamboo is the most widely used material for furniture making in Indonesia. There is potential for the bamboo industry to provide employment and income to local people, but currently it is still largely exported as raw material, or as low quality furniture (Widjaja 1998). Bamboo seems to be of little importance for the booming Indonesian export economy (Rolle 1995). Even to calculate the value of bamboo exports has been difficult, as different bamboo products are often not mentioned in the statistics. It is reported that bamboo furniture exports reached their peak in the 1990s, with exports destined for over 20 countries. However, the peak period did not last long as Indonesian furniture makers were unable to meet increasing standard requirements from international buyers. Now bamboo furniture manufactured by cottage industries is widely available across Indonesia, but the quality is typically poor.

The Indonesian government has a national program for bamboo management aimed at improving bamboo utilization to promote rural community prosperity. The national program aims to achieve the following objectives (Kartodihardjo 1999):

- Make rural communities familiar with bamboo management in order to improve their income opportunities

- Decrease illegal forest cutting
- Increase bamboo research in order to support sustainable bamboo utilization
- Increase investment in bamboo industry and business
- Conserve bamboo species in each province
- Develop private bamboo plantations and home industries
- Develop bamboo state forests and bamboo private forests to support industry needs on a larger scale

The Status of Forest Tenure in Indonesia

Indonesia's forest tenure is very complex in comparison to China and India. Social conflicts over forest rights between the government and local communities feature largely in the forest tenure situation in Indonesia. There is no private ownership of forestland (FAO 2005). The government owns all forestland and has the authority to issue harvesting permits or concessions to companies. The issue of who should control or own Indonesia's forests is widely seen as the underlying source of the many challenges facing Indonesia in managing its forests, and the origins of this controversy lie in large part on simplistic interpretations of what and where Indonesia's forests are (Hermosilla and Fay 2005).

The term "forestlands" is not a legal term in Indonesia and is not even an expression that is used in the general discourse on forestry and forest management. The legal term used is "Forest Zone" which does not correspond to actual forest cover and is defined as "a certain area which is designated and/or stipulated by government to be retained as forest" (Hermosilla and Fay 2005). The most recent data from the Indonesian Ministry of Forestry shows that the designated Forest Zone accounts for 120 million ha, corresponding to 62% of the total land surface of Indonesia. Of this, there are only approximately 87 million ha covered by forests and some 33 million ha have no forest cover (Hermosilla and Fay 2005).

The uncovered 33 million ha of land is populated and used by local communities, numbering between 40 to 60 million—it is this land which is under contention and is the root of the conflict between the government and local and indigenous communities. In many cases, generations of local inhabitants have been dependent on forests for their livelihoods and believe they have the customary right to the lands—in their minds, they own the forestland where they live. Consequently, they often react violently to uphold their rights when extensive timber concessions are granted by the government to corporations (Hermosilla and Fay 2005).

To understand the land tenure system in Indonesia, it is necessary to trace its evolution and examine what customary rights are, whether communities have legal rights to the land on which they depend, and to what extent they are allowed to exert these rights. Much of Indonesia's conflict over forest tenure can be attributed to the government's failure to recognize the legal standing of customary rights held by local communities.

Evolution of Land Tenure Regime

Indonesia's rich tropical forests were taken over by the Dutch colonial government, which laid the foundation for a state forest administration which continues to this day. With Indonesia's independence, the 1945 Constitution, as well as various other pieces of legislation, made it clear that all natural resources were to be controlled by the state (Hermosilla and Fay 2005). This likely explains why there is no private forestland ownership existing in the official documents released by the Indonesian government. However, Indonesia is a country with a huge rural population accounting for 75% of the total 200 million population, and some 40 to 60 million people live in or around the forest (Fourie and Soewardi 2000). Not surprisingly then, prior to Dutch colonial rule, there were legal provisions for local communities having customary rights to forests.

The diminishment of customary rights can be seen from the reviews conducted by Alcorn and Royo (2000) and Fay et al. (2000): the Dutch colonial Forest Department tolerated customary rights in those areas that were not yet under the effective control of the government. Thus, in many places, particularly in the outer islands, customary forms of forest management and tenure continued to operate with little change during the colonial period. When Indonesia became independent from the Dutch, the Constitution declared that all natural resources were to be controlled by the State, while Article 18 of the Constitution implicitly recognized customary rights but made these rights subsidiary to other national objectives. Similarly, the 1960 Basic Agrarian Law (BAL) stated, "Indigenous law shall be recognized, providing this does not contradict national and state interest." Again, the 1967 Forestry Law recognized customary rights but treated them as usufruct rights and subordinated them to national interest. The 1999 Forestry Law did not change the concept of customary community tenure rights but added conditions by stating that certain areas of the Forest Zone can be recognized as "Customary Forests" but these forests must be classified as "State Forest." Today, most of Indonesia's forestlands remain "customarily owned," but not recognized by the state (Alcorn and Royo 2000, Fay et al. 2000).

There has been some good news regarding the recognition of customary rights. For instance, Government Regulation 24, issued in 1997, provides a procedural framework for the recognition or awarding of the various classifications of land rights. Under this regulation, lands are divided into two categories: the first being Customary Lands, where rights can be recognized to have existed prior to the enactment of the BAL, and the second being State Lands, which are open for distribution to private entities. However, there is little de facto recognition of Customary Lands thus far, and even less political will to do so (Hermosilla and Fay 2005). Thus, while the government has considered the customary rights of the local communities to the forest and natural resources, these rights largely exist only on paper.

Forestry has been a major engine of growth for Indonesia, with forestry as the country's largest export earner within the agriculture sector (FAO 2006). Despite legal recognition of customary forest rights, Indonesia's land use system caters to granting large timber concessions to private corporations. According to statistics from Global Forest Watch

(GFW 2006) in 2005, “Logging concessions covering more than half the country’s total forest area were awarded by former President Suharto.” Once the valuable timber is extracted, the remaining land and forest resources are classified as degraded forests to be utilized for large plantations or other uses. This compounds the pressures for deforestation and forest degradation (Barber et al. 1994). In practice, millions of hectares of natural forest have been cleared to make way for plantations that, in 75% of cases, are never actually planted and lay idle (GFW 2006).

Problems with Indonesia’s Forest Tenure Regime

1. Lack of willingness to recognize community rights to forests

Reforming Indonesia’s forest tenure policy and the legislation that contributes to the insecurity of land tenure is widely accepted as critical to improving Indonesian forest management (Banerjee 1997, Blomkvist and Djuwadi 2000, Hermosilla and Fay 2005). Although the Ministry of Forestry itself recognized this need by admitting, “Systematic mistakes have occurred in the designation of Forest Zone status with the result that social conflict has arisen and is still ongoing,” the post-Suharto regime was not willing to take the necessary steps to solve the tenure problem (Hermosilla and Fay 2005).

Legal recognition of land rights would require a radical change in government attitudes, since the government has traditionally ignored and even excluded communities from participating in decisions related to the forest (Hermosilla and Fay 2005). Numerous laws and regulations have stipulated that the customary rights of communities shall be recognized providing they do not contradict national and state interests. The fact is that these rights have never been respected by the government. As Hermosilla and Fay (2005) stated, “in the past, extensive timber concessions were granted in areas occupied by rural communities that have no resources to law. Similarly, since the mid-1980s, the government’s promotion of estate crops, such as tree crops and oil palm, converted forests without consideration of community rights.” At present, facing lobbying from international organizations, research institutions and NGOs, the Ministry of Forestry continues to drag its heels on instituting tenure reforms. Opponents of community ownership of forests argues that local communities would likely sell their land and this would worsen the situation and that collusion among community leaders to appropriate benefits would take place when the government handed over lands to local communities (Hermosilla and Fay 2005). While it is not uncommon for a few leaders to dominate community debates and to steer decisions favorably in their direction (Thamrin 2002), mechanisms can be created to resolve this problem. Land is the foundation of wealth; if the state will not change the concept of “state control,” there is no reform that can be carried out successfully to pull the country out of the crisis of depleting forest resources.

2. Lack of positive approaches to managing the forests

Jeffrey Campbell, program officer for community-based natural resource management in the Ford Foundation's Jakarta office, in a paper he wrote with his colleague Diah Raharjo,

optimistically states “There are more opportunities than ever before for community forestry to take off in Indonesia” (Charle 2000). Despite the unwillingness of the government to grant ownership of lands to the local communities, there are now 29,000 ha of forest which have been placed in the hands of a Krui Adat⁵ community with the efforts of NGO and international organizations. The area is part of a new classification of State Forest Zone termed “Zone with Specific Purpose” (Hermosilla and Fay 2005). Under this classification, the government assigns the management rights to the community - this initial step is the first time that a community management scheme was officially recognized in a Forest Zone. This is regarded as the first step towards recognizing ownership by others of State land (Charlé 2000).

Establishing long-term leases of state forest zones has been proposed as an alternative to help local communities legally gain access to forests. Clearly, leases are not equal to full ownership, but at present they may offer the only short-term option that is politically feasible (Hermosilla and Fay 2005). As for the management rights granted to the Krui, there are some restrictions set by the government that might cause the cancellation of the contract. The award can be revoked if the Adat community is dissolved, their activities go against the Forest Law and other rules, or if the activities are against the public interest (Charlé 2000). Nevertheless, and on the basis of the positive Krui experience, work has been carried out by NGOs to expand this model, with improvements, to other communities of proven ability to manage forests, but no additional “Zones with Specific Purposes” have since been created (Hermosilla and Fay 2005).

3. Lack of sectoral collaboration and ill-preparation for decentralization

Currently, disputes between different sectors under the same government or different levels of government are common, as each sector acts to defend their respective interests in forest management. The conflicting administrative laws and regulations in forest policy are rooted in the competing agendas of different sectors. Ironically, decentralization in Indonesia—regarded as a positive initiative that would lead to greater government accountability to the people—actually created more complications. Indonesia transformed itself, almost overnight at the end of Suharto government, from one of the most centralized states in the world to one of the most decentralized. Because of political instability that dominated the period immediately after 1999, there was poor preparation for the implementation of the new decentralization framework (Hermosilla and Fay 2005). The lack of clear rules and the incapacity of the central government to monitor and enforce the law have translated into local government initiatives that go well beyond the responsibilities assigned by the laws and regulations issued by the central government, resulting in the loss of national coherence in the sector’s policies and public administration (Hermosilla and Fay 2005).

⁵ *Adat* community is “a traditional community still bound together in association, having *Adat* institutions, customary law that is still adhered to, a territory defined by customary law, and whose existence is affirmed by the community itself together with government.”

While laws were enacted, corresponding regulations were not. Various pieces of legislation, including the new decentralization laws, were contradictory or inconsistent with other legislation (Hermosilla and Fay 2005). For example, a presidential decision states that land tenure matters are under the authority of the central government while the 1999 regional governance law gives autonomy to districts to make decisions concerning land matters, including the settlement of conflicts (Sembiring 2002). As local governments have to seek revenue under their jurisdiction, granting forest concessions became a fast and easy way to achieve economic objectives. Hence, it is common that national, provincial and district offices issue overlapping and conflicting timber licenses which contribute to over harvesting.

4. Lack of law enforcement

In developing countries, while forest protection may be stated as a government priority, the requisite funding is rarely provided by the state. Given the open boundary of government controlled forests and conflicts over land rights between local communities and government, as well as lack of manpower to conduct inspections, there is weak enforcement of laws and regulations relating to forest management. In some cases in Indonesia, there are laws and regulations that do not include penalties in case of non-compliance (Hermosilla and Fay 2005). If conversion to other land uses takes place in an area where they are not permitted, there is no way for authorities to undertake enforcement action because they cannot impose any sanctions on violators (Hermosilla and Fay 2005). Furthermore, with decentralization, not only can the subjects who are regulated gain knowledge of the new laws, but in some cases they may even know the new regulations better than enforcement agencies. Therefore, there is little fear amongst violators once they know there are no penalties or enforcement.

Recommendations for Developing Bamboo Resources

Indonesia's bamboo sector is wrought with problems, including: illegal logging; lack of large, organized bamboo industries; prevalence of low-cost, low value added bamboo products; lack of bamboo research, and lack of inventory data for bamboo lands. The impediments to Indonesia's bamboo development are largely rooted in the country's overall problems with lack of secure forest tenure rights, poor government regulatory controls, and disorganization. To solve these basic problems, Indonesia needs to start with some important steps to initiate bamboo sector development. In other words, Indonesia must learn to walk before it can run.

The following are recommendations for improving the bamboo sector:

- Indonesia needs a bamboo inventory. It is necessary to determine how much bamboo currently exists, where it is located (e.g. on degraded or marginal land), and what species and quality the stocks are. Many studies cite the lack of reliable data on Indonesia's bamboo inventory. This information gap needs to be filled before the country can develop a plan for bamboo development.

- Further studies on cultivation methodology and utilization are urgently needed. So far, cultivation methodology is not related to utilization of the bamboo. This means that there is little practical information on which species are best for particular applications. It is important to know whether a bamboo species would best be used for conservation purposes, food, or manufacturing into commercial products.
- Establish an association of Indonesian bamboo producers, which could help set up quality standards and implement effective quality control, provide a forum for the exchange of information and ideas, coordinate with government agencies in formulating favorable bamboo manufacturing policies with regard to export and import regulations, and also organize business promotion activities and build a marketing network.
- The government needs to give the full authority of law behind recognizing community user rights to the forest, including bamboo. Until this tenure issue is resolved, there will be ongoing hostility between the government and forest dependent communities. Bamboo management can only thrive under a more stable system of tenure where bamboo growers can have management and user rights to the crops they grow and harvest.

Summary

Indonesia's forests are highly threatened by a complex mix of deforestation, illegal logging, catastrophic fires, rampant corruption, poor regulatory infrastructure and low public trust in the government's ability to properly manage its forests. A significant part of the problem is an ongoing dispute over forest rights between the government and indigenous and other local communities. Despite mounting international pressure and increasingly tense relationships between the government and forest dependent communities, the Indonesian government has failed to launch tenure reforms to recognize the customary forest user rights of the people. Without sincere political will to bring benefits to forest dependent people, no reforms can emerge. Once there is political will in place, legislative and regulatory changes, a strengthening of law enforcement, and capacity building (e.g. technical and financial assistance) are likely to improve bamboo management.

Chapter 6: Ethiopia

Ethiopia is a mountainous country with a land area of 1,127,127 square kilometers. It forms the major portion of the horn of Africa, which is the eastern-most part of the African landmass. Ethiopia remains one of Africa's poorest nations and many Ethiopians rely on food aid from abroad (Wikipedia 2006). Ethiopia's poverty-stricken economy is based on agriculture, accounting for half of GDP, 60% of exports, and 80% of total employment. The agricultural sector suffers from frequent drought and poor cultivation practices (CIA World Factbook 2005). The contribution of forestry to the national economy has not been surveyed systematically, although economic statistics indicate that forests contribute 2.8 percent of Ethiopia's GDP (FAO 2005). In this economic context, it is not surprising that Ethiopia's bamboo sector has not progressed very far.

Forest Status in Ethiopia

About 4.2% of Ethiopia's land area is forested with an area of 4.6 million hectares. The existing natural high forests are located in the less populated and less accessible southern and southwestern parts of the country. Most of the forests are inaccessible because of a lack of roads and the mountainous geography. These important highland forests are grouped into 58 National Forest Priority Areas for conservation purposes; however, protection of these areas has not been ensured because of deforestation. Deforestation is often a result of farmers searching for new agricultural land and fuel wood, and in the search process farmers establish camps and small land clearings. Indeed, the energy sector of Ethiopia remains heavily dependent on wood for fuel. Over 90 percent of the country's total energy for household cooking is derived from biomass fuels, of which wood provides 78 percent (FAO 2004).

Bamboo Sector in Ethiopia

Africa has about 43 species of bamboo covering about 1.5 million hectares (Kigomo 1999). Forty of these species are primarily distributed in Madagascar while the remaining three species are found in mainland Africa. Of the countries in Eastern Africa, Ethiopia possesses considerable bamboo resources, and there are two indigenous species of bamboo in Ethiopia. Ethiopia has over one million hectares of highland and lowland bamboo resources. The coverage of lowland bamboo is estimated to be 1,000,000 hectares, while highland bamboo coverage is estimated to be 300,000 hectares (Kelbessa et al. 2000). This means that 86% of the African bamboo resource is found in Ethiopia.

In Ethiopia, bamboo is a subsistence material for rural communities. Rural people are largely dependant on raw bamboo for construction, fencing, household furniture, household utensils like cups, local pipes, vessels for carrying and storing, and as a source of domestic energy (J. Fu, personal communication, April 2006).

Bamboo has been slowly cultivated in Ethiopia. Farmers in rural communities have some experience planting highland bamboo, but there is little published information about lowland bamboo plantings. However, according to a survey conducted by Kelbessa et al.(2000), an increasing number of households are realizing the economic potential of bamboo cultivation and these households have started to cultivate bamboo around their homesteads. Cultivation is primarily for domestic use by the operator and as a source of supplementary cash income.

Ethiopia does not have a modern bamboo based processing industry, and the handicraft sector is poorly developed and concentrated in the cities of Addis Ababa and Injibara. Family-based enterprises produce household utensils for a small urban market. As illustrated by Kelbessa (2000), the manufacturing units in Injibara are entirely family-operated while those in Addis Ababa use both family and hired labor. Bamboo-based handicrafts or manufacturing enterprises producing for the market are not as widespread in the rural communities. There only exists a very limited local market for bamboo handicrafts, which is not further developed or organized. Many of the products are processed manually and there are no modern tools or equipment involved with the exception of some family enterprises in Addis Ababa (J. Fu, personal communication, April 2006).

Realizing that production and consumption of bamboo and bamboo products in East Africa is very limited, and that many traditional uses of bamboo are of low value, UNIDO supported a program titled “Launching of market based development with bamboo in Ethiopia and Kenya.” The program aims to create employment and income opportunities through bamboo development. The long-term objective of the project is to promote the development of the sustainable production and use of bamboo products in Ethiopia and Kenya, with a focus on markets as the driving force behind such sectoral development (UNIC 2006).

Forest Tenure in Ethiopia

Prior to 1975, over 75% of the country's forests were owned by the private sector. In 1975 the Public Ownership of Rural Land Proclamation (No. 31 1975) resulted in nationalization of the land. This proclamation also abolished private ownership of forests, and the government became the sole administrator of all forests covering more than 80 ha (FAO 2004). Farmers’ associations became responsible for forests less than 80 ha in size. According to this proclamation, which served until 1991, no person was allowed to own or hold land in private. The use of forestland was based on a system of quotas issued by the forest administration. The law also prohibited the sale, lease, exchange, rent or mortgage of land (Mengistu 2002).

Under state forestland tenure system, 58 National Forest Priority Areas (NFPAs)—the most important highland forest areas with a size ranging from 10,000 to 300,000 ha—were established. The original objectives behind the establishment of NFPAs were to protect and develop the remaining natural forests, allocate available resources to these

areas, and introduce integrated forest management. However, the natural forest management program did not bring about the expected results. Forest areas outside the NFPAs were not managed, and most NFPAs were occupied by farmers claiming residual rights to those areas. Furthermore, the small number of forest guards had no appropriate legal power to stop illegal felling and illegal settlement.

After the foundation of the new Democratic Republic of Ethiopia, a new Rural Land Administration Proclamation was formulated in 1997 (No 89. 1997). In itself, the proclamation did not change land ownership very much. It reinforced the policy that all land belongs to the state, and farmers are entitled to lifelong, inheritable and transferable rights to the use of land and trees planted on land (FAO 2004). However, at the same time, Ethiopia's forestry legislation was critically revised, with major policy changes in regards to forest ownership, tree tenure rights and forest product pricing and marketing. According to the present Forestry Proclamation (No. 94 1994), there are three types of forest ownership categories: State forests, Regional forests and Private forests. The regional states administer land according to or based on the general provisions of this proclamation (FAO 2004). The new proclamation encourages the involvement of private sector and the local communities in the development and management of forests. It also recognizes the need to ensure that communities residing within state and regional forests benefit from the development of the forests (Mengistu 2002).

In reality, implementation of this proclamation has been delayed, with slow progress in establishing operational rules and clear guidelines on issues such as identification of state forests and regional forests as well as production and protection forests (Mengistu 2002). Legal access to the forests was not given to Ethiopia's forest dependant people, which further eroded their respect for the NFPAs. Thus the establishment of the NFPAs was unsuccessful in ending encroachment on forests and halting deforestation. Indeed, the Environmental Protection Authority disclosed that some two million hectares of forestland is now irreversibly barren, amounting to an annual loss of over 144,000 hectares of forestland (EPA 2002).

Bending to international criticism of its inadequate forest tenure policy, the Ethiopian government began a pilot initiative to reform forestland tenure by granting exclusive user rights to the recognized members of WAJIB (short for *Waldayaa Jiraatoota Bosonaa*, which means Forest Dwellers' Association in the local language). In addition, some of the NFPAs are trying participatory forest management (PFM) with the objective of achieving sustainable forest management through community empowerment.

Box 2: WAJIB – A New Approach to the Sustainable Management of Ethiopia’s Forests

The main principle of WAJIB

Granting exclusive user rights to the recognized members of WAJIB, in order to ensure improved forest conservation and to empower local people in forest management as well as to improve livelihoods of the forest dwellers through sustainable forest management.

The main strategies of WAJIB

- Regulating access: forest dwellers are granted exclusive user rights with clearly defined and agreed upon rights and duties. Patrolling forest blocks by members and their respective family members is the effective mechanism used by the WAJIB members to regulate access.
- Reducing pressure: non-forest dwellers are encouraged to plant trees for various purposes around their homesteads.
- Making trees profitable: possibilities for non-wood income from forests, such as bamboo, are assessed and implementation of options encouraged.

How WAJIB works:

The NFPA in a given village is subdivided into forest blocks. Each block is managed by an organized user group of not more than 30 members based on the calculation of a carrying capacity of 12 ha per homestead. In order to provide a legally binding agreement, a Forest Block Allocation Contract (FBAC) has been elaborated by the project, which contains the rights and duties of the forest administration and the forest dwellers. According to the FBAC, the rights of the WAJIB include settlement in the forest block and utilization of forest products for both home consumption and for sale. The duties of WAJIB include restricting settlements to the carrying capacity of the forest block, maintaining initial tree cover, paying forest rent, and regulating access. The annual forest rent is about \$1 USD per ha and is only payable for the area not covered by forest in order to encourage the WAJIB to increase forest cover. The duties of the forest administration include providing technical and organizational assistance, conducting annual tree cover assessment and settlement censuses, defending the interests of WAJIB against others, and providing assistance in cases of litigation. The forest dwellers have legal rights to decision-making with regard to forest management, protection and utilization; decisions are made by the general assembly of WAJIB members, WAJIB leaders and executive committees.

The initial outcome of WAJIB:

- A responsible utilization of forest resources has been accepted by the participants of WAJIB with the abandon of previous wasteful utilization. The members put the following measures in place towards wise forest utilization: only dead wood is used for fire wood; only branches of trees are removed for fence construction; a limited number of mature trees are harvested by members after obtaining permission from the assembly and selection of harvestable trees by executive committee of the WAJIB; pasture lands are closed temporarily to grow grass;

browsing animals are not allowed in forest regeneration areas; the expansion of farm plots and compound fences is strictly prohibited, etc.

- The forest dwellers are gaining access to saving and credit schemes from the income that is generated from sales of grass, bamboo, and other forest products.
- The WAJIB groups possess more healthy livestock and they have closer and recognized access to wood products, which they also sell at the local markets.

As of 2003, nearly 40 WAJIB groups were established in nearly 17,000 (Kubsa et.al. 2003).

Challenges Facing Bamboo Development in Ethiopia

Although Ethiopia has the greatest bamboo resources in Africa, unlike the Asian countries, it has a limited tradition of cultivating bamboo and manufacturing bamboo products. The use of this abundant resource is restricted to the household level, and the primary use of raw bamboo material is for housing, fencing and household utensils. There only exists a very limited local market for bamboo handicrafts, which is not further developed or organized. Lack of a regular raw bamboo supply in the operating centers such as Addis Ababa has become a serious bottleneck to manufacturers. Manufacturers reportedly spend several days searching for suppliers and supply points in rural areas. In addition, bamboo areas are characterized by the absence of bamboo-based value added processing for increased income and employment (Kelbessa et al. 2000).

There is lack of technical knowledge on bamboo management. It is reported that homestead bamboo cultivation is a traditional production system, which does not involve the use of purchased inputs such as commercial fertilizers and hired labor. And no harvesting regulations presently exist and cutting is seriously depleting the resource base in the areas where extraction is concentrated (Kelbessa et al. 2000).

So far, bamboo development is not listed as a priority issue in the government's agenda. The Ethiopian government does not realize the potential of bamboo in meeting rural people's subsistence needs and contributing to the rural economy. The federal government has little understanding of how rich the bamboo resources is and what could be achieved by developing these resources in Ethiopia. Coupled with the country's many other socio-economic challenges, it is no surprise that there has been little development in government strategies to improve bamboo management and utilization (J. Fu, personal communication, April 2006). It has been reported that the government had a plan to strengthen the management and use of native bamboo and reed species in 1994. The program focused mainly on assessing the market for bamboo as a raw material for export, manufacturing and marketing of artifacts, and use in the paper and pulp industry. But so far little improvement on bamboo development can be seen in Ethiopia (Kelbessa et al. 2000).

Embaye (2003) concluded that “the principal cause that has led to the neglect, under-utilization and destruction of the Ethiopian bamboo forests are two: insecurity of land tenure right and lack of economic incentive to value them as useful commodities.” In Ethiopia all natural forests including bamboo forests belong to the state, yet the government lacks economic incentive and the financial capacity to protect and manage them properly. The limited government attention is focused on natural forests from where timber can be profitably harvested for industrial use (Embaye 2003). When rural people face the shortage of food and raw material for subsistence needs, thousands of hectares of bamboo are either left to decay or degrade for lack of proper management (J. Fu, personal communication, April 2006).

Given the limited market demand and lack of technical know how on bamboo management, the percentage of bamboo plantations established by farmers is very small. When farmers realized that there is no large demand for bamboo culms in rural markets, and that transporting them to nearby urban areas was not financially viable (Embaye 2003), they chose to focus on other products that can guarantee a stable income.

Recommendations:

- Take active bamboo tenure reforms. Given inefficient bamboo management by the government, it is time to give rights to the farmers or groups who are committed to manage the bamboo resources properly. Examples of state control failing to achieve improved protection and management of natural resources is evident everywhere. People take better care of property under their direct control because they can see the benefit and feel secure if they have the right to the resource. Except for bamboo in some critical environmental sites, the rest should be distributed to the community or farms to raise their incentives in bamboo management.
- Organize bamboo cultivators and producers so that they have a stronger collective voice in advocating for tenure reforms, greater government technical and financial aid, and more say in developing new bamboo policies. It is important that those who are most affected or who have the most to gain are heard and their concerns represented in future policies.
- Partner with NGOs and donor agencies to provide more training and technical knowledge on bamboo growing, management, harvesting and production. Since the government alone cannot by itself provide sufficient capital, it is necessary to work with NGOs and donor agencies to transfer technology to local growers and producers. This includes obtaining foreign aid to establish seedling nurseries which can provide raw material.
- Create potential markets by promoting financial and technical investment in bamboo-based industries. Given the poor economic situation that Ethiopia is facing, the country will need to attract foreign capital either from private investors

or from donor agencies to invest in bamboo industries. This includes the promotion of related bamboo management and processing technology. For example, exploration of bamboo charcoal technology should be introduced as it has the potential to increase the efficiency of fuel energy utilization so that the timber forests could be set aside for a better environmental use.

Summary

As one of the countries facing critical deforestation, the Ethiopian government has been struggling to fight for the protection of its remnant forest resources. Fuel wood consumption greatly contributes the loss of forests in Ethiopia. Bamboo, as a good substitute of wood with versatile uses, should be should give special attention. In particular, technology on bamboo charcoal should be introduced to Ethiopia for the sake of saving the nature forests resources base. At this point in bamboo development, Ethiopia's first step should be to increase its awareness of and commitment to, the bamboo sector. Hence, increasing the awareness of the government is of great importance. It has been reported that senior government officials have shown some growing interest in bamboo utilization in Ethiopia. With financial support from the Ministry of Commerce of China, INBAR has held several workshops in Ethiopia to both raise awareness of bamboo's potential and to transfer technical knowledge on bamboo propagation, growth and utilization (INBAR 2005). Continuing efforts such as these are critical to laying a foundation for Ethiopia's bamboo development.

Chapter 7: Kenya

Kenya is a country in eastern Africa bordered by Ethiopia, Somalia, Tanzania, Uganda, Sudan and the Indian Ocean. Agriculture is the mainstay of Kenya's economy, contributing over one-third of the Gross Domestic Product. Agricultural crops include tea, coffee, and horticultural products (CIA 2006). Over 80% of the population in Kenya relies on agricultural land for food and income. The total population of Kenya is currently estimated to be 30 million people. This is expected to double by 2025 (Kameri-Mbole 2005).

Kenya is world famous for its safari wildlife, and 12.3 percent of its land area is currently under some form of protection. The country has 1,103 species of birds, 261 mammals, 407 reptiles, 76 amphibians, and 6,500 species of plants (FAO 2005).

Forest status in Kenya

Kenya has a wide range of forests, from coastal forests to central high montane forests to the thick wet rainforests of the west. In 1992, the vegetation cover assessment showed that the closed canopy indigenous forest covered 1,240,000 ha, while the plantation area was 230,000 ha. Most forests are state-owned, and forest resources are mainly used for fuelwood, which supplies 70 percent of the country's energy (FAO 2005).

6.2% —or about 3,522,000 hectares—of Kenya is forested. Of this, 20% —or roughly 704,000 hectares—is classified as primary forest, the most biodiverse. Between 1990 and 2000, Kenya lost an average of 12,600 hectares of forest per year. This amounts to an average annual deforestation rate of 0.34%. Between 2000 and 2005, the rate of forest change decreased by 1.4% to 0.34% per annum. In total, between 1990 and 2005, Kenya lost 5.0% of its forest cover, or around 186,000 hectares. Kenya lost 38,000 hectare of its primary forest cover during that time (FAO 2005).

From FAO's ownership and use statistics in 2000, 97.8% of Kenya's forestland with an area of 3,504,000 ha is publicly owned, while the remaining 2.2% with an area of 716,000 was privately owned (FAO 2005).

The Bamboo Sector in Kenya

In Kenya, the bamboo area is estimated to total 150,000 hectares, of which some stands are pure and others are a mixture with trees and shrubs (Kigomo 1999). Bamboo is mainly found in the central highland mountainous area where human population and agricultural settlement are also concentrated. Compared to the forest area with a total of 6.8 million hectares, bamboo only accounts for 2.2% of the country's forest (Kigomo 1999). However bamboo plays an important role in providing income for the peri-unban

and rural people who are engaged in various activities in bamboo harvesting, collection, transportation, processing, packaging and marketing (Ongugo et al. 2000).

Table 6: Consumption pattern of bamboo in Kenya (Ongugo et al. 2000)

Uses	Quantity (culms)	Percentage consumption
Fencing	2,400,000	74.5
Prop in the flower industry	634,000	19.6
Construction	142,000	4.5
Toothpicks and skewers	27,000	0.8
Incense sticks	7,000	0.2
Basket and Handicraft	13,000	0.4
Total	3,223,000	100.0

Utilization of bamboo in Kenya is largely confined to domestic usage. Most of the bamboo is used unprocessed or semi-processed. In the highland areas where bamboo resources are plentiful, fencing, homes, and food storage constructions are major uses of bamboo (Kigomo 1999). Bamboo is also commonly used in the flower industry. Toothpicks and skewers, incense sticks and baskets consume a small-scale bamboo resource with a total of 1.2% of total bamboo consumption. Despite this small percentage, these uses provide employment opportunities to rural and peri-urban people. The consumption of bamboo shoots is relatively small and the annual production of edible bamboo shoots is only 38000 (Ongugo et al. 2000).

There are currently no value added bamboo based industries in Kenya. Thus the bamboo sector has not been able to make a major contribution to the national economy. Cities such as Nairobi and Naivasha are the major bamboo processing and consumption centers (J. Fu, personal communication, April 2006). The existing studies on bamboo in Kenya blame the lack of processing industries on the government's unfavorable policies towards bamboo development, such as classifying bamboo as a minor forest product and the 1982 presidential ban on natural bamboo harvest (Kigomo 1999, Ongugo et al. 2000). There is no specific funding or technology input into the bamboo sector from the government.

Although bamboo harvesting was banned in public natural forests, controlled harvest was allowed under the authority of the forest department to provide bamboo to flower industries and agriculture (Kigomo 1999). Local farmers, small enterprises and the horticulture industry use bamboo under controlled licenses. It is estimated that 99.4% of the bamboo consumed comes from state bamboo forests, while the share of bamboo supply from farmlands is only 0.6% (Ongugo et al. 2000).

With harvest controls on bamboo, farmers are reluctant to establish bamboo plantations on their farmlands even though there might be great demand for bamboo production. Only 3.4% of total households surveyed by Ongugo et al. (2000) grew bamboo on their farm lands, and the area for bamboo plantations accounted for 1.6% of total land area held by the households (Ongugo et. al 2000). The current ban on natural bamboo harvest, lack of knowledge of bamboo management, the uncertainty of bamboo marketing, as well

as the competition for alternative land use such as tea or coffee plantations are the main constraints farmers face in growing bamboo. The survey also discovered that bamboo productivity on farmland is not as high as on natural bamboo stands. The stem length and diameter of bamboo plantations are smaller than that those found in natural forests, and stocking levels were found to be higher in natural forests than on the farmlands. That means there is no advanced technology in bamboo management delivered to the bamboo growers, so that they are not likely to improve management skills and bamboo productivity. If farmers cannot see certain benefits from bamboo growing, they are most likely to convert bamboo lands to other cash crops, such as tea or coffee which can guarantee a stable income. Proximity to markets where bamboo products are sold is another factor in the establishment of bamboo plantations. In the east coast area near the larger cities, a relevantly high demand exists for bamboo products. In these areas farmers have more incentive to establish bamboo plantations (Ongugo et al. 2000).

The harvest control on bamboo also created an illegal logging problem in state bamboo forests. It was estimated by Ongugo et al. (2000), who carried out a survey on bamboo production and consumption, that most of the actual bamboo cutting is illegal. A rough calculation of actual bamboo use versus official figures shows a stark difference of 88%, indicating that a large part of the bamboo used in Kenya is illegally harvested.

Through the available literature review (Kigomo 1999, Ongugo et al. 2000), both plantations and state bamboo forests are not managed properly. There is nearly no labor, capital or technology input into bamboo management. Harvested bamboo is mainly used in the fencing and flowering industries without any processing, and these two industries account for 95% of total bamboo consumption. The consumption of bamboo for home building is not popular in Kenya, with only 4.5% of harvested bamboo used in house construction. The remaining small portion of bamboo is processed by craftsman or small cottage industries, where there is not much value added to the products. In general, Kenya's bamboo sector is not well developed and its potential for the development of the economy and farmers income has not been realized either by government or bamboo users.

Forestland Tenure Status in Kenya

The land tenure system in Kenya can be characterized as private, communal (or customary), state-owned or open access. Privately owned lands comprised 6% of the total land area in 1990 while government (formerly crown land) owned about 20%. The most common type of land holding is trust land⁶. These are former native areas awaiting small hold registration that will effectively bring them under private ownership. They comprised 64% of total land area in 1990 (FAO 2005).

⁶ Trust land consists of areas that were either native land that has not been taken, or land occupied by the natives during the colonial period and which have not been consolidated, adjudicated and registered in either individual or group names and over by the government.

Land in Kenya is owned by four different kinds of entities: the government, country councils (or local authorities), individuals and groups. The Rural Land Act in Kenya was intended to be the overall land law applied to private owners. However, the objective of bringing all land in Kenya under this act has not yet been achieved. With regard to government ownership, the taking up of land by the colonial government and the assumption of title to all land in the Crown gave the government the power to assume rights over land and vest them in other holders as it deemed appropriate. Upon independence, the Crown Lands Ordinance became the Government Land Act under which the national parks were governed. The private lands are governed under the Rural Land Act which applies to the land formerly held under customary law, namely native reserves and trust lands, but at present owned by individuals with titles. The local authorities (designated as councils) manage all the resources within the trust lands under their jurisdiction and control the development of that land under the Trust Land Act.

It is notable that trust land is increasingly converting to individual, group and state ownership. Group land tenure is governed under the Group Representatives Act, which defines a group as “a tribe, clan, family or other group of persons whose land under recognized customary law belongs commonly to the persons who are for the time being the members of the group.” Each group gets a certificate of incorporation. They thus have ownership of the land in perpetuity and can only be cease to be a group by the vote of all numbers (Kameri-Mbole 2005).

A range of forest tenure ownerships exist in Kenya, although most is state-owned. Most of the natural forests in the high potential growing areas are under state ownership, designated to fulfill protective and productive functions. In addition to government owned plantations, there are also plantations under corporate ownership, largely established to cater to the fuel wood needs of tea production. In the semi-arid areas there is a mix of private farms and woodlands under the ownership of local authorities. In the dry areas the most prevalent mode of ownership is communal (FAO 2005).

Under the recent 2005 Forest Act, forestland ownership falls under three categories: state forests, local authority forests, and private forests. This new Forest Act stipulates that all forest in Kenya other than private and local authority forest are vested in the state. The local authority, with the consent from the central forestry department could take and declare any land under the jurisdiction of the local authority. Established and registered private forest owners are entitled to receive technical advice regarding appropriate forestry practices and conservation and to receive loans from forest development funds administered by the forest service.

Problems Arising from the Tenure Regime

The wide range of ownership has an impact on the management of the forest resources. While legally most of the natural forests and plantations are under government ownership, a variety of factors have undermined the capacity of the Forest Department to manage the resource sustainably. Encroachment and illegal logging have undermined the productive

and protective functions of the forests under government control. A similar situation exists in the communally owned area in the arid and semi-arid zones. Over the years the large-scale expansion of livestock population, increasing human population and increased production of charcoal have led to significant degradation of resources (FAO 2005, BBC 2006).

A current report from a UN agency confirms that over the last few years massive destruction of Kenya's natural resources, especially forests and the soil, have occurred. Forest cover is now estimated to stand at less than 2%. Information from Bird Life International (BLI 2002) shows:

Kenya's forest resources have been seriously depleted and modified by over-exploitation and are still declining. Extreme poverty results in heavy subsistence demands, especially for firewood and building materials, and illegal activities within the forest, such as poaching (of wood and animals). These activities endanger the forest resources that have up to now helped to support local communities, leading to a vicious circle of degradation all too often seen in tropical forests.

Both government and local communities are said to contribute to the current depletion of Kenya's forest resources. It is reported that on several occasions, parts of the reserved forest have been earmarked and allocated for clearance for agriculture or settlement by the government (BLI 2002). Field experts and NGOs advocating to save the forests in Kenya argue that failure to involve the public, who are the custodians of these resources, in the ownership and sharing of benefits arising from such assets is to blame for their increase depletion (OGIEK 2005).

Facing nation-wide forest degradation, shortage of resources for management by government agencies, and inadequate representation of stakeholders in forest management, NGOs and foreign donors have strived to enhance the establishment of a participatory forest management model. Arabuko-Sokoke Forest is the first state-owned forest in Kenya where the government had allowed community involvement in forest management. The pilot project has improved survival of forest and fauna in the region by establishing and supporting management and conservation practices with community involvement (BLI 2002).

The Kenyan government has been struggling for some time with forest depletion and has enacted logging bans and conservation of major water catchment areas. After constant pressure from NGOs and the international community, the government recognized the role that forest communities play in the conservation of the forest resources. It acknowledged this in its embrace of the participatory management strategy in its new Forest Act.

The 2005 Forests Act of Kenya was characterized by adopting the participatory forest management strategy. It recognizes customary rights to forest produce by the forest community and provides legal backing to the community forest management approach.

Under the new Act:

- Customary law is recognized, granting legal access to the forest by the forest community to take forest produce, even for the purpose of sale⁷.
- Community forest associations are formed. These associations may apply for participation in the conservation and management of state forest or local authority forest. Under the management agreement signed with the forest service, the association may be entitled to the following rights: collection of medicinal herbs, harvesting of honey, timber, fuel wood, and grass, grazing, collection of forest produce for community based industries, eco-tourism and recreational activities, plantation establishment, contracts to assist in carrying out specified silvicultural operations, and development of community wood and non-wood forest based industries⁸.

In addition, any interested individuals or groups are encouraged to manage the government plantation under a license, concession, contract, or joint management agreement⁹. Forest communities or their members are qualified to obtain user rights to nature reserves for natural, religious, educational or scientific reasons. These policy changes are a radical change in forest management strategy, which used to favor total state control over the forest. The government is starting to realize that when people have a personal stake in the forest, they will manage it better. As one senior forestry official states, “Once we educate people and ensure that they have a stake in the benefits arising from the natural resources in their neighborhood, then they can help in conserving such assets” (OGIEK 2005).

Problems Facing Bamboo Development in Kenya

Whilst general forest tenure reform has made some progress as indicated above, bamboo development in Kenya remains rudimentary. As stated by Kigomo (1999), the policy on management and utilization of forest resources does not adequately address specific needs of the bamboo sector, as the forest policy is restricted to development and utilization of major wood products.

As illustrated by Ongugo et al. (2000), Kenya faces fundamental constraints to the steady development of the bamboo sector:

- current ban on the exploitation of bamboo resource
- classification of bamboo as a minor forest product
- lack of organisation among the various user groups
- lack of recognition of the sector in the national economy
- production of semi-processed or unprocessed products

⁷ Part III article 21 of 2005 Kenya Forests Act in Kenya

⁸ Part IV article 45 of 2005 Kenya Forests Act in Kenya

⁹ Part IV article 37 of 2005 Kenya Forests Act in Kenya

- poorly developed marketing structures
- lack of information on availability of planting materials
- lack of information on propagation, establishment, crop management and harvesting methods
- poor infrastructure in bamboo growing areas
- Lack of appropriate technologies in processing.

Given the proven success of bamboo development in generating rural income and contribution to the country economy in China, the Kenyan government should rethink the harvest ban imposed on bamboo forest and build awareness of the great role bamboo can play in addressing problems such as food shortages and commodity scarcity. Some international organizations such as INBAR have realized the problems facing bamboo development and foresee the promising future of bamboo utilization in east African countries, including Kenya. A few projects have been implemented to help to understand the bamboo status and to kick off initiatives on bamboo development (Fu, Per.com).

Recommendations

There does appear to be some effective demand in Kenya for bamboo products. As Ongugo et al. (2000) stated, there is strong demand for fencing on cattle ranches and for poles in the flowering industry. And bamboo furniture sold in Kenya have a very good market price, sometimes fetching prices higher than similar items sold in China (Fu, Per.com). This implies that there is potentially a bigger market for bamboo products in Kenya. Some suggestions for encouraging bamboo development in Kenya:

- Create awareness on the potential of bamboo for all stakeholders, especially amongst government policymakers e.g, international organizations involved in enhancing bamboo development should organise meetings or workshops to government senior officials to learn what has been achieved in other bamboo rich countries.
- The government should review the effectiveness of current policies that affect the development of bamboo, such as the harvest ban on state bamboo forest (since bamboo regenerates very rapidly).
- The government should make reforms specific to bamboo tenure, granting management rights to the communities or individuals living in or around the bamboo forest, which will raise their incentive to take a more responsible attitude towards the management of natural bamboo forest.
- The government should encourage the establishment of bamboo plantations on farm land to meet the increasing demand of bamboo products.
- The government should reinforce technology extension aimed at bamboo growers and processors through establishment of demonstration plots in the village, or by

offering periodic processing training classes through the local forest department or research institute, as well as NGO.

- The government should help to support small and medium scale bamboo processing industries by providing low interest loans and infrastructure.
- The government should develop a market research group to study the market for bamboo production by creating research institutes or through subsidizing research. This is needed initially to provide growers and manufacturers with data. As the bamboo industry grows, this activity should be taken over by the private sector.

Summary

Kenya's forest resources have been seriously depleted and over-exploited and are still declining. Extreme poverty results in heavy subsistence demands, especially for firewood and building materials, and illegal activities within the forest, such as illegal logging. It is acknowledged that the failure to involve the public in the ownership of forest resources and sharing of benefits arising from such assets is to blame for the increasing depletion. As one of the poorest countries in the world, Kenya faces a chronic shortage of manpower for protection and management—participatory forest management could help to encourage better forest management through increased participation. Once the forest dependant community could have a fair share from the benefit arising from the forest, they would have incentive to take a responsible attitude to its protection and utilization. Since 70% of Kenya's energy consumption is from fuelwood, bamboo is also an excellent wood substitute with fairly short rotation compared to wood. For this reason it should be considered seriously by the government and relevant agencies. Although the new Forest Act is in favor of the local forest community, the effective implementation of this policy is critical to successfully giving management rights over forest to local people. The logging ban imposed on natural forest including bamboo, needs to be reviewed as it discourages any further development of the bamboo sector.

Chapter 8: Tanzania

Tanzania is an East African nation tucked between Kenya and Mozambique, and bordering the Indian Ocean. According to the Ministry of Natural Resources and Tourism, Tanzania has a land base of 945,000 square km and a population of over 30 million, making the country relatively rich in natural resources, although the area of arable land is low (MNRT 2000). Tanzania is one of the poorest countries in the world, with an economy that remains heavily dependent on agriculture, which accounts for 50% of GDP and employs 80% of the labor force (CIA 2006).

In 2000, Tanzania's forest cover was estimated at 38.8 million hectares, which comprises 43 percent of total land area. Twenty-nine percent of the forest resource is protected, much of which, being located on steep slopes, is retained to control soil and water erosion. The rural population relies significantly on forests and its products such as fuelwood, honey and construction materials. Fuelwood provides around 90 percent of the people's energy demands. The productive forest is managed mainly for fuel and timber production. Under growing population pressure, forests have been converted to agriculture. The deforestation rate was at 91,000 ha per year as of 2000. In addition, livestock development, wood energy, industry and mining have contributed to the deforestation (FAO 2006).

Bamboo Resources in Tanzania

Bamboo is an important natural resource widely available in Tanzania. It is mainly found in natural forests or forest reserves in the southern and northern parts of the country. Bamboo in Tanzania is used for construction, piping, furniture making, handicraft, beverages (juice or alcohol), fuelwood and in agriculture for soil conservation purposes. It is estimated that bamboo forests cover an estimated 127,000 hectares in the high rainfall forests and in lowland areas receiving good rainfall (Leonardo).

In Tanzania, the land tenure system at the village level largely operates through traditional customary ownership of land¹⁰ (MNRT 2000, Mango 2001). Most farmers are keen to undertake planting and cultivation, but they lack the technical expertise and resources to do so. Only about 5% of the estimated total household land under cultivation is planted in bamboo, which indicates that most of the bamboo resources are wild. There is no management of the natural stands of bamboo (TAFORI 2000).

¹⁰ Customary land rights are deemed rights to natives and therefore should be according to customs of tribes. One important feature of the customary right is that it has no time limit. The obligations and rights to own land depend on the customs of the tribe, which are inherited from their ancestors. The major drawback of the customary land ownership is lack of written principles. The majority of Tanzanians own land under this land tenure system. The Village Land Law of 1999 translates customary land ownership into written documents with the intention to improve the security of the customary right of the land ownership to be equal to the certificate of right of occupation, normally granted by the commission for Lands (Mango 2001).

Before the Forest Policy of 1998 came into place, there was no legal access to the forests by local communities, thus much of the harvesting of forest products, including bamboo, was illegal. In most cases, bamboo resources are collected at no cost from public forest reserves, as there are insufficient forest guards to patrol protected areas (TAFORI et. al 2000). The revised land and forest policies provide for legal access to such resources by establishing joint resource management between the government and communities living in or around forest reserves (TAFORI 2000, Mango 2001, Wily 2001).

The State of Forest Tenure in Tanzania

There are three types of forest management in Tanzania. The first type is the forest reserve with large areas under central government control and a lesser area under local government. The second type is the non-reserved forestland (general land) with open access, whereby anyone from surrounding communities is able to access the forest. The third type is village or community managed forest including forest gained through customary rights and forest gained from the government under the joint management agreement. While most of the forestland is under the control of the government, there is a growing trend whereby land management rights on non-reserved forest and also on some of the reserved forestland is shifting to villages and private sectors through negotiations with the government. This shift is a reflection of the state's realization that it cannot effectively manage forestlands on its own.

At present, Tanzania's new Land Law 1999 continues the centralized forest management system introduced by German colonialists in the 19th century and incorporated in the British colonial land ordinance of 1923 (MNRT 2000). Under this law, all land is publicly owned and under the control of the state. Two-thirds of Tanzania's forest resources are on publicly owned land. There are 13 million hectares designated and registered as forest reserves that are owned and managed by the central government through the Forestry and Beekeeping Division (FBD) of the Ministry of Natural Resources and Tourism (MNRT) (Kihyo 1998, FAO 2006). The local government owns and manages 600,000 ha of forestland (MNRT 2000). A large part of the non-designated forestland (19 million ha) is not under any formal ownership or management and is vulnerable to deforestation (MNRT 2000, Kihyo 1998, Mango 2001). As Bromley (1992) states: "everybody's access is nobody's property." This non-designated public forestland is generally referred to as "General Land." General Land is best understood as all the land between village land and that which is reserved and therefore not under the jurisdiction of any particular Ministry or Agency. General land in Tanzania is in effect subject to an open access regime, just like most unprotected forest reserves. About 70 percent of natural forests and woodlands in the country are in general land and are hence subject to rampant degradation (MNRT 2000).

The rights to occupy and use land are composed of two kinds of rights: (a) statutory rights of occupation whereby the government grants land user rights for up to 99 years but which are subject to conditions of land development, and (b) customary rights for occupation, where customary tenure takes precedent and there is no time limit (Mango

2001). Of the two rights of occupancy, the customary tenure system is primary at the village level in Tanzania, with some 80% of farmland under customary tenure (MNRT 2000).

As part of a series of reforms to resolve land disputes between the government and communities which have occupied forest lands for generations, the National Land Policy 1995 and Forest Policy 1998 encouraged individuals, companies, communities and villages to acquire title deeds for customary forest occupation. Thus, the rights of occupation held by villages became recognized by the National Land Policy 1995 and later these rights were stipulated into the Land Law 1999. Before the new Land Law was enacted, there was no written title for the customary land rights. Now the government is advocating entitling these customary rights with statutory rights of occupation.

Before the Forest Policy of 1998¹¹, there was no legal access to forest reserves by local communities. This meant that harvesting of forest products, including bamboo, was illegal. Facing deforestation and over exploitation in the unreserved forestlands, the government realized that it was incapable of managing and protecting these lands. New forest policies issued in 1998 initiated joint or community management of protected lands, giving individuals the right to manage forests and wildlife in non-reserved lands and encouraging individuals to establish woodlots by granting them concessions or lease agreements. Under these reforms, non-reserved forestland was granted to interested individuals or entities with a period of 21, 33, 66 or 99 years (Mango 2001).

Greater involvement of the private sector is taking place in Tanzania. The revised land and forest policies provide room to access such resources by establishing joint resource management between the government and NGOs or communities bordering forest reserves. It is estimated around 300,000 hectares of forest in several hundred locations are now managed by communities (MNRT 2000). At present, the plantation area under private and community forestry is estimated to be around 70,000 to 150,000 ha. This includes small sized community woodlots (<1.0 hectare) and large plantations run by large private companies (Kihyo 1998, MNRT 2000).

In the process of land reform, apart from the government's willingness to recognize customary land rights and give management rights to the private sector, international donors are also playing an important role in providing policy support, technical, and financial assistance to forest conservation efforts and initiatives for joint resources management in Tanzania. The World Bank and Global Environment Facility supported the Forest Conservation and Management Project, which aims to support institutional change and improve service delivery through the establishment of the Tanzania Forest Service (TFS) (FAO 2004). The TFS will take responsibility for protecting and managing the country's forest resources, encourage participatory forest management by

¹¹ In March 1998, the government approved the National Policies for Forestry and Beekeeping, in which the overall goal is to enhance the contribution of forestry and beekeeping sectors to sustainable development of Tanzania. New concepts and approaches introduced in the policies include the management of public forest reserves by specialized agencies or by the private sector; the establishment of Joint Management Agreements, which consider user rights and benefits of local communities and NGOs living in and around forest areas, with a clear definition of forest land and tree ownership.

supporting the extension of Village Forest Reserves and Joint Forest Management Agreements, and improve revenue collection from forests and woodlands.

Problems with Tanzania's Forest Tenure Regime

Although Tanzania is considered to have made the most progress in all of eastern Africa in promoting participation in forest management, there are some problems existing in the forest tenure arrangement as well as forest management.

1. Lack of specific regulations implementing the law

There is no specific law regulating forestland tenure or bamboo tenure in Tanzania. Instead there is a general land law regulating all land property and land use. Ironically, the existing Land Tenure Act of 1992 and Land Law of 1999 are not fully implemented because there are still no regulations to enact them (MNRT 2000). As the transfer of forestland to other partners must be done through contracts and agreements as provided by law, confusion exists as to which groups have various responsibilities and rights on forestland amongst the parties involved in forest management (Wily 2001).

2. Disputes over land rights

Only 13 million hectares of forestland is designated as forest reserves and is protected by the government—the rest of the classified forest resources are open to public access. Since the boundaries of most villages are not surveyed, land is not clearly defined between the villages. Disputes over village borders and boundaries have arisen over control of non-designated forest resources. In addition, disputes also occur between household and village leaders, as some village leaders allocated land to outsiders without the consent of the villagers, who under customary arrangement are the custodians of the land in their respective areas (Mwalyosi 1990).

The dispute over land rights is further complicated by a lack of clear delineation of forest boundaries, so that forests in General Lands and Village Lands are encroached upon by competing uses such as agriculture, wildlife, and rangeland (Mango 2001). Joint management of forest reserves requires surveying of forest boundaries and clear classifications for land use. The government must prioritize the surveying of forestlands to fix boundaries, which should help to resolve some land disputes. Surveying boundaries is a prerequisite for titling and registration of properties. Proper valuation of the land should also be done following surveying, as the government can not transfer the lands without knowing the value of the properties. Knowing the land value will enable the government to levy land taxation and land rents.

3. Gender discrimination exists

In Tanzania, women are not allowed to own land due to customary law, even though women play an important role in farming activities and are therefore major forest

stakeholders. Men alone have the right to own land through customary laws. This is in spite of the 1997 forestry policy clearly defining forestland and tree tenure rights for local communities, including men and women (Barrow et al. 1999).

4. Lack of government support in managing forest resources

Tanzania was regarded as the African country with the most progress in enhancing joint resources management. However, in spite of foreign donors' efforts, support from local or central governments for development of plantations or bamboo resources have been scarce. In all the villages surveyed by Salaam (2000), there has been no construction of roads to the resource base, no capacity building, and no access to capital. Human resources for extension are extremely inadequate. It is estimated that the extension staff reaches only 27% of the rural majority. Even though Tanzania is famous for its vast natural forest resources, the sustainability of this resource is in serious question without proper management.

Problems and Recommendations for Bamboo Development in Tanzania

There are a number of problems constraining Tanzania's bamboo development, impeding the potential of bamboo to generate income and alleviate poverty in rural areas (TAFORI 2000, Leonardo). It is reported that there is a decline in the supply of bamboo resources from natural stands. A lack of proper harvesting and management of natural bamboo leads not only to insufficient supply for processing demand, but also results in over-exploitation of the resource. The root cause lies in the unfavorable forestland tenure system, which limits forest communities' access to the bamboo resource in the forest reserves. In general, local communities have no management rights on neighboring forests and are not involved in proper management. People will cut as much as they can without any care of the age or regeneration of bamboo if they know they might not be able to harvest the bamboo in the future. Also, the government's lack of financial capacity and manpower exacerbates the situation, as it does not have sufficient manpower to patrol and protect natural bamboo stands. Even for planted bamboos, management by farmers is limited to clearing the ground around the clumps to maintain fire barriers. Planters do not use fertilizers to improve yields from the clumps.

There is no modern bamboo industry in Tanzania at this time. Use of bamboo in handicraft is still in its infancy. Bamboo processing is limited to a cottage industry characterized by handmade products. There is little capacity building for the craftsmen. The skill level of the craftsmen is quite low and they can only produce a limited number of simple items, which restricts them in the marketing of their products and puts them at a disadvantage when dealing with retailers.

There is an obvious lack of government support for bamboo development. As mentioned above, the government lacks the financial capacity to provide support. But the immediate impediment is that the government itself does not realize the potential that bamboo could play in meeting rural subsistence needs and reducing deforestation. Bamboo is still

categorized as a minor forest product. There is no support from the local or central government for development of the bamboo sector. In all the villages visited, there is no construction of roads to the resource base, no capacity building and no access to capital.

Recommendations

- The Tanzanian government should recognize the potential of bamboo development to improve its rural economy. National plans or guidelines on bamboo development should be developed. As a non-timber forest product, bamboo has great value in providing subsistence products as well as generating income for poor forest dependant families. Without reforms to the current situation of bamboo management in Tanzania, it is unlikely that the bamboo sector will be able to alleviate poverty or help to conserve natural resources. Government will and commitment to bamboo development is a prerequisite to all other recommendations.
- To ensure a sustainable bamboo natural resources base, the government needs to hasten the pace of forestland tenure reform, and extend joint forest management to bamboo forests. The decline of natural bamboo resources is not likely to stop unless the communities adjacent to bamboo forests have guaranteed long-term rights to the land and resources. Only under a secure tenure regime can responsible bamboo management be expected from forest dependant people. Additionally, technical and capital assistance should be provided as an incentive to growers for the establishment of bamboo plantations on farmland or homesteads. This will help to stabilize the raw material supply for the processing industries.
- Create a potential market by transforming the existing bamboo processing industry. This will guarantee the economic benefits to growers and bamboo managers; otherwise, it is unlikely for them to take care of the bamboo resources after they gain tenure security. The Tanzanian government should actively partner with international NGOs or governments of other countries to cooperate and share technology and development experience. This would help to reorganize the current bamboo cottage industries as well as provide training for the improvement of skills and product diversity. At present, a bamboo based action research development project is being developed in Mbeya, Tanzania. The project involves multiple aspects geared toward promoting effective bamboo growth, management, and use, including participatory inventory of natural and cultivated bamboo (including locations, species, growing area, growing stock, annual incremental volume, and the uses each species is put to natively, as well as the potential usage for new products) and the expansion of cultivation of productive commercial bamboo species. The project is also addressing establishment of community-owned plantations (individual or group basis), the introduction of process-flow manufacturing, and the establishment of a bamboo pilot nursery. More project such as this one are needed (INBAR 2004) .

Summary

Tanzania faces rampant deforestation in large open access forests, boundary disputes, and little cultivation of bamboo outside of natural stands. Reforming Tanzania's tenure system to recognize customary land rights, surveying forest resources to delineate borders, and building technical capacity in bamboo management and utilization are necessary first steps. Tanzania has made some initial achievements in tenure reforms by documenting customary rights and giving access to the forest and bamboo resources back to rural people. However, there is still no specific law regulating forestland tenure or bamboo tenure in Tanzania, leaving many groups confused as to who has responsibility over what. Even with reforms, customary rights remain only within the domain of men, not women. It is clear that tenure reform cannot achieve sustainable forest management without clarity of legislation, good law enforcement, requisite funding and technology assistance.

Chapter 9: Conclusions

Bamboo development in Africa and Asia varies extensively across countries, but many also share similar challenges and obstacles. This report has provided an overview of bamboo development in seven countries, highlighting current forest tenure systems, bamboo growing and manufacturing activities, the problems facing the bamboo community, and the role of the state in the bamboo sector. This concluding chapter will focus on the main thematic issues challenging these countries, as well as recommendations for what is needed to move bamboo development forward. The focus will be on general lessons, rather than country-specific lessons, since the latter is found at the end of each country chapter.

Political Willpower and Government Commitment to Reform

There are two important steps which governments must take to encourage the bamboo sector—yet many of the countries reviewed have yet to do so.

1) Recognize the potential of bamboo as a forest product that can help to alleviate rural poverty and that can provide important environmental, as well as economic benefits.

Many subsistence communities depend on bamboo, but as a forest product it has typically paled in comparison to timber, and has not received either the commercial interest or government funding that has benefited timber products. This recognition is essential before any progress can be made.

A few countries have started to realize the importance of bamboo and have designated new bamboo initiatives, such as creating agencies tasked with promoting bamboo development. For instance, a number of states such as Mizoram in India have established their own Bamboo Development Agencies to develop and promote activities that encourage bamboo development. These activities include mapping the bamboo resources, giving power to the village councils to manage bamboo resources, regulating bamboo harvest, developing bamboo plantations, organizing bamboo trade organizations with linkages to bamboo growers and the bamboo processing industries, encouraging and promoting establishment of bamboo enterprises, and disseminating market information as well as transferring management technology. Yet most of the countries studies have yet to fully comprehend the importance of bamboo. Ethiopia, as African's bamboo kingdom with about 1 million ha of bamboo forest, has yet to make any real effort in bamboo development. Without acknowledging the potential of bamboo and designating it as a priority area, little else can be achieved.

2) Reform state-control over bamboo tenure rights

Once bamboo is recognized as important and warranting development, there is perhaps nothing more critical to bamboo development than reforms which grant improved access

rights and tenure security on bamboo forests. Without tenure security, farmers are unlikely to be motivated to invest in or manage bamboo on their land.

Bamboo tenure is a complicated issue, in large part because in all the countries studied, bamboo ownership and user rights are lumped together with general forest user rights. That is, there are no specific rights attributed to bamboo use versus forest use. This is largely a reflection of the previously stated problem—that bamboo is not yet recognized as being important enough to warrant its own set of tenure rights.

Reform of forest tenure to encourage bamboo development is the foundation for any bamboo initiative. That is, without tenure reform, other initiatives are less likely to produce long-term success. Thus tenure reform comes a close second to the first step of prioritizing bamboo as an area worthy of further development.

Tenure reforms and new management initiatives have begun in some countries, such as India, the Philippines and Indonesia, but these reforms failed largely because the government's efforts fell short of giving real tenure security to forest dependent communities in these countries. China and Tanzania, which have achieved some significant improvements in tenure arrangement, still face many challenges as land allocation lacks transparency, and there is a lack of financial and technological investment in timber and bamboo management.

Reforms in forest tenure face a common set of problems across developing countries:

1) Lack of equitable tenure arrangements

Forests, as a renewable natural resource, have great economic value and are a source of income to many people. For those developing countries where much of the rural population is dependent on products gathered from the forest, forest rights allocation is central to the equitable distribution of wealth. To have property rights—either user or ownership—is to have secure control over a stream of future benefits (Hazra 2002). Therefore, optimal forestland rights allocation is of great significance to the income generation of forest dependant people, and failure to do so leads to social conflict as well as poor management of the forest. Hazra (2002) concludes that deforestation often results from social injustice and political inequalities. An inequitable tenure system denies customary access to, and use of, forest resources, thereby generating resentment against the government. “The history of the struggle of forest dwellers for their rights is as old as the legislation governing them” (Singh 1986). Conflicts will always remain as long as the tenure system is unfair and achieving sustainable forest management will remain an elusive goal. The countries examined in this report illustrate clearly that where forest dependent communities are denied access to the forests, or have only limited rights, forests tend to become degraded as communities rush to use what they can before the state takes away their rights. Meaningful conservation can be expected only when a community is given property rights to the forests and thus rights to extraction from the ecosystem they conserve (Hazra 2002).

The state's general reluctance to part with its sole authority over forest resources is a major obstacle to tenure reform. Forest resources are viewed as a revenue source, and thus governments are reluctant to give up state control over forest management even as many administrations publicly swear by land reform. All the selected countries in this study have undergone hundreds of years of colonial rule by foreign invaders. After gaining their independence in the 1950s and 1960s, their economies were nearly bankrupt. Forests presented an easy source to generate export income to restore economic capacity, and thus states were adamant about retaining sole control over forest resources. Unfortunately, the evidence suggests that absolute state control over forest resources usually results in inefficient and inequitable use of resources. The forest concession systems adopted by countries like India, Indonesia and the Philippines have led to rapid degradation of forest resources through over harvesting and unchecked exports of timber (Kant 2001, Talwar and Ghate 2003, Saigal et al. 2002, Hermosilla and Fay 2005, Gould 2002).

With the global shift in national forest policies towards a goal of sustainable forest management, there has been a dramatic shift emphasizing conservation, restoration, and meeting local subsistence needs, instead of extraction of timber resources. Correspondingly, initiatives were taken in some countries to reallocate forest resource control between the state and local forest dependent communities. While China and Tanzania have made some progress in this regard, others like Indonesia are still debating what user rights local communities should have, and reforms have been few. Although India, the Philippines, Ethiopia and Kenya undertook joint forest management (or participatory forest management) initiatives, progress in terms of improved forest management and conservation has been spotty. Furthermore, much of the financial support for initiatives on joint forest management is from foreign donors, and the results have fallen short of donor expectations (Hazra 2002 De La Paz 2000, Hermosilla and Fay 2005).

The reluctance of these governments to enact true forest tenure reforms can be seen from these facts: no land tenure was granted to the local communities, forest land under the JFM are mostly degraded land, and management rights to forestland can be withdrawn at any time if the government changes its policy or local communities break the agreement. Obviously, the government is neither ready to give up control of forest resources nor to prioritize the people's needs. Programs like JFM in India are still viewed by forestry officials as a strategy to regenerate degraded forestland but not as a strategy for poverty alleviation and income generation for poor forest dependent people.

2) Denial of customary community rights to the forests

Prior to colonial rule, forest dependent communities had unrestricted user rights to the forests. The existence of the forest communities depends on a close and ecologically sustainable relationship with the forest they inhabit (Hazra 2002). Following the establishment of the state's property rights over forests with the intention of extracting the economic value of forests, customary rights to the forest were rescinded, depriving

forest dwellers from accessing their primary subsistence resource. People who lost their traditional rights to the forest are the poorest in the country—forests are their lifeline. Losing access to the forests is a loss of basic living conditions.

Once local people realized that they might be prohibited from collecting the everyday products they needed from the forest, their reaction was to capture as much as they could as long as they could. People no longer cared about the traditional way of rational use and sustainable management of forests because their user rights to the land would now be curtailed and they had no long-term investment in the health of the forest. With no concern about the people's need for subsistence and local communities' customary rights to the forest, deforestation and indiscriminate felling became rampant in these countries. Indonesia is well known for its high rate of deforestation and illegal logging, while the Philippines went from being the world's biggest exporter of tropical hardwood in the 1970s to being a net importer of forest products by the 1990s.

3) Lack of legal clarity

As governments moved towards sustainable forest management strategies, new forestry policies were enacted, and existing laws amended to improve management. However, contradictions and inconsistencies in the laws or regulations can be found in each country. Many of these countries emerged from years of dictatorship and thus lacked the experience to develop laws on decentralization or denationalization. For example, India has had a forestry policy emphasizing local people's subsistence needs since 1988, but there is still no amendment of the forest act to give this policy legal backing. In Indonesia, too many government departments and local authorities have a role in allocating rights to forestland and resources, creating overlapping mandates and great contradictions and inconsistencies among administrative laws and regulations. In the Philippines and China, changes in rules or in land reforms themselves, have created uncertainty and confusion to forest users who crave consistency. In China, Ethiopia and Tanzania, while laws were enacted, corresponding regulations were not. This lack of stability and clarity can itself contribute to continuing forest degradation, even though they were attempts to increase community involvement.

4) Weak law enforcement

Enacting laws and regulatory policies are important, and they are only as successful as legal enforcement is effective. To a great extent, weak law enforcement in developing countries contributes to ineffective forest reforms. In developing countries, while forest protection may be stated as a government priority, the requisite funding is rarely provided by the state. Given the open boundary of government controlled forests and conflicts over the land rights between local communities and government, as well as lack of manpower to exert inspections, there is weak enforcement of laws and regulations relating to forest management. In Indonesia, there are laws and regulations that do not include penalties in case of non-compliance. In those countries where forest concessions are granted, given the close relationship between big industrial corporations and politicians, the corporations have no fear of violating the rules regulating harvest practices and rarely are punished

even if they are guilty of illegal activities. In China and Tanzania, tenure reforms were at least partly successful, but continued lack of transparency and corruption influence the complete implementation of tenure reform policies. Lack of supervision over law enforcement, and the power to allocate user rights to the land in rural China is largely concentrated in the hands of village leaders, which creates opportunities for corruption and inequality. Many village leaders use their political advantages to allocate larger and higher quality plots of forestland to their families or friends, or transfer forestland to the outside at a lower price to get the commission for themselves. Transparency of land allocation requires strict enforcement of law and increased oversight of the tenure agreement process.

Necessary Factors to Implement Forest Tenure Reforms

The issue of forest tenure is at its essence a question of balancing equality and efficiency. Lack of equality in the tenure arrangement evokes severe social conflict and large-scale deforestation. Does an optimal tenure regime necessarily lead to efficient forest management? No, but it is probably fair to conclude that efficient forest management is unlikely without an optimal forest regime. Tenure security raises the incentives of stakeholders to invest long-term in forest management; people living in poverty will find it very difficult to improve the quality of the forest resources allocated to them due to the lack of financial and technology capacity. An optimal tenure arrangement still cannot achieve the goal of efficiency in forest management without efficient market mechanisms. If farmers cannot sell their produce in free markets at prices that reflect the demand for those products, then their incentive to be productive and to care for the land will be diminished. That is why state control over forests, forest products and their sale is usually a formula for failure. Therefore, optimal forestland tenure arrangement, market mechanisms, and the requisite funding and technology assistance are key factors which must be considered to achieve effective and efficient forest management. Additionally, optimal tenure regimes must be backed by legislation. As legislation is the embodiment of the ruling class, the first and most important issue required to establish a reasonable forestland tenure regime is to develop the appropriate political will to recognize the importance of granting the forest user rights to all stakeholders, not least of them local communities.

1) Political willpower and government commitment to reform

Although it is well acknowledged that community rights over forest resources should be recognized and backed by policies and laws, some governments in developing countries are not ready to return user rights to local communities. Fortunately, the global political environment with respect to forest conservation has improved in recent years (Hermosilla and Fay 2005) and is having a positive effect on raising public involvement in forest policy in many countries. Decentralization is occurring in many countries. In Indonesia and the Philippines, local communities are acquiring a greater say in the shaping of government policies over forest management. In India, the needs of local people have become a priority in the management of forests, although much remains to be done. With increasing democratization, people around the world are demanding a greater voice in

decision-making and are holding their leaders more accountable. In China, farmers commonly voice their dissatisfaction with government policies, and local and state governments are increasingly responding to calls for reforms. The success of Anji's bamboo forests tenure reforms illustrate how political will brought a positive impact to bamboo management and the development of the rural economy. By transferring the user rights to bamboo forests to farmers through the government's adoption of the household responsibility system, farmers gained great incentive for bamboo management.

2) Developing a tenure arrangement model based on key characteristics

There is no single best model of tenure regime since political, economic, and social differences mean that each country must find their own solutions. Thus, the tenure arrangement suitable for China might not be transplanted to Indonesia directly. But it is clear that raising the incentive of the local communities and rural households to manage forests productively, helping them to be involved in decision-making, and lifting market restrictions on their forest produce are all characteristics of developing a sound forest tenure system. Other important characteristics include:

a) Recognizing the customary rights of communities to the forests and bamboo resources

Community rights in many countries have been traditionally ignored, which led to tense relationships between the government and rural communities, as well as continual depletion of forest resources.

The global community has attached great importance to the protection of community property rights. As stated by Hermosilla and Fay (2005):

The Universal Declaration of Human Rights (United Nations General Assembly 1948) establishes that nobody shall be deprived of his property even if this property is not documented in official papers. The International Labor Organization Convention 169 contains provisions on indigenous and tribal land rights which require respect for customary occupations and provides measures to recognize and protect those rights. It states that indigenous customary ownership over lands should be recognized (ILO 1989). The UN Committee on the Elimination of Racial Discrimination also recommends the recognition and protection of the rights of indigenous peoples to own, develop, control and use their communal lands, territories and resources.

The verdict on whether community management of forests actually results in better management and conservation of forests is mixed, depending on the case study. In some cases communities have simply sold their land interests to industrial developers, while in others it has resulted in more conservation. But it is clear that depriving communities of legal rights to the land does not offer any positive incentives to manage the land more efficiently, and community participation is an important democratic trend which is increasingly sought after. Obviously, after giving communities their user rights to the

forest, the government must retain regulatory oversight to ensure that communities manage their forest user rights soundly.

b) Granting secure forest user rights to farmers

Beyond customary user rights, granting farmers secure, long-term rights to forestland is essential to foster improved management of the forest and forest productivity. The decollectivization of forestlands in China was a big success in what had been a long checkered history of failed land reforms. Farmers now have unprecedented autonomy in managing bamboo forestland leased from collectives, with a reasonable operating term. Under the household responsibility system, farmers can make their own decisions about when and how to plant, manage and harvest their timber and bamboo, and where and at what prices to sell their products. Also, within the contract period, the farmers can transfer the leased land to others and leave it to their successors. The success of decollectivization is evident from the increase in China's forest coverage, which rose from 12.98% in 1980 to 18.21% in 2005 (SFA 2005). In 2002, China passed a new law on leasing rural land, which laid out several provisions on granting user rights on forestlands to farmer households for up to 70 years, protecting the legal rights to forestland held by farmers from being violated by any individuals and organizations. It is very difficult for those without tenure security to take good care of the land as they have less incentive to manage for the long-term.

Clearly, granting long term user rights to forestland and control over the use and sale of the products harvested can significantly encourage farmers to carefully manage their lands, even though the *de jure* land ownership of the forestland remains under the collective. Countries like Ethiopia and India with rich bamboo resources but without any management of them should take active bamboo tenure reforms to give rights to bamboo forests to the farmers or groups who are committed to manage them properly. People take better care of property under their direct control because they can see the benefit and feel secure if they have the rights to the resources.

c) Development of due process for land allocation

The misuse of power in allocating common property by village heads is a common trait of many of the countries examined, including China, India, Indonesia, the Philippines, and Tanzania. A common concern shared by opponents to the decentralization of forestland tenure in Indonesia was that community elites would capture control of the common forest resources and use them to benefit their own friends and family. To address this issue, a well-understood and transparent due process must be introduced at the village level.

An important step in establishing due process in common property management at the village level is to ensure that villagers know what their property rights are, and have a voice in decision-making. In developing countries, where many farmers may be illiterate, farmers may not be aware of their forest use rights under the law, leaving them

vulnerable to village heads who may choose not to inform them fully. Without transparency and information sharing, farmers are at a distinct disadvantage.

Farmers should be full participants in making decisions about management planning, management activities, produce use, and income-sharing generated from common properties such as collectively managed forest and bamboo lands. One way to protect their voice in decision-making is to ensure that the make-up of the decision-making body includes farmers, not just village heads. It is also advisable to include groups typically marginalized, especially women, who play a critical role in forest dependent communities but are often left out of decision-making.

India's Joint Forest Management only goes half-way in giving farmers the freedom to manage the forest but the JFM system has produced some important improvements in participatory management which are useful for other countries to take note. In a case study of community forests in three villages of India conducted by Talwar and Ghate (2003), a democratic decision-making institution was introduced into forest management by broadening participation to community stakeholders. The villages registered under JFM were required to form a general body and an executive committee. The general body of the committee is composed of one man and one woman from each household. All members are qualified to participate in the meetings that are held once a month. The decisions related to the forest are made only in the general body meetings. The executive committee is composed of eight men and three women who are elected by the general body, with a fixed term of around five years. The executive members can be removed by a majority vote by the general body. The members of the executive body work on a voluntary basis and do not receive any payment or material compensation (Talwar and Ghate 2003). This form and function of the community forest management committee prevents the possibility of power abuse by traditional community heads and gives the power of decision-making on forest management back to all members in the community. This kind of decision-making process is viewed as an optimal institution that is extremely welcomed by the members of the community, and helps to enforce the rules on forest management and protection.

3) Introduction of market mechanisms

The government should give up some of its powers and functions to the open market, instead of trying to do everything itself. For marketing forest produce such as bamboo, the government should not have a monopoly, nor create such a monopoly for traders and enterprises. In the long run, development of market mechanisms will encourage healthy competition and bring more benefits to the rural communities and forests.

The failure of state controlled forest management in India and China has proved that forests can never be managed efficiently without the function of free market mechanisms. Facing the fixed and lower price of forest products as well as bamboo products under the rigid planned economy, even the state forestry company and the collectives had no incentive to practice good management. Tenure reforms in these countries show that the government is willing to bring benefits to forest dependent communities and people. In

addition to tenure reforms, the realizations of the benefits that will accrue to the forest dependent communities depend upon the realization of just prices for the products (Hazra 2002).

In India, there are no free markets for bamboo products. The natural bamboo resources are under the control of the state. Even after the 1988 forest policy, there is no sharing of management rights on state owned land. Although households may hold rights over forest produce such as bamboo, the state allocates shares of the produce (including bamboo) to the households. This mechanism is inadequate and inefficient (Hazra 2002), and does not offer true freedom of user rights over the forest. The state monopoly of bamboo resources and bamboo produce price limits the establishment of bamboo-based local enterprises and the innovation of bamboo products. In contrast, in the Chinese province of Anji, the government abolished state monopolies over bamboo products and trade, and overnight hundreds of private bamboo enterprises and traders emerged. The free market was the determinant of bamboo prices, not state agencies. In effect, rapid development of bamboo processing enterprises and larger demand for bamboo raw material provided a necessary market to the farmers. Market competition became active and contributed greatly to the innovation of bamboo products and its development into value-added products, which in turn created more revenue. Obviously, land tenure reforms work best with the interaction of market mechanisms.

4) Structural changes in the role of forest departments

With the progressive shift of the forest to the local community and rural households, the function of the forest department must also change. Priorities should be on providing services to the community or households in forest management, rather than directly managing the lands. The forest department's main task will be comprised of technical extension, training of the forest management stakeholders in forest management skills, assistance in preparation of forest management plans, forest research, regulatory duties, dissemination of market information and monitoring of contractual agreements if any between the government and the local people or between the local communities and outside individuals and corporations about forest management (Hermosilla and Fay 2005).

Increased Research to Fill Large Information Gaps in the Bamboo Sector

Across every country and at every level, it is clear that there remains large information gaps on the bamboo sector, including how much and where the bamboo is located, how to grow and manage bamboo, how to process bamboo into products, and what products are in demand and how best to market them. Some countries have a reasonable amount of data—such as China—whilst others, particularly in Africa—have yet to get even a good grasp of how much bamboo they have.

1) **Bamboo Inventory**

Any plan for bamboo development should be based on the bamboo inventory. It is essential to get a better sense of how much bamboo there currently is, where it is located, what species and quality the stock are, and which species and stands are good for commercial use. Many of the countries examined cite the lack of reliable data on their bamboo inventory as an impediment to further development. These information gaps need to be filled before the respective countries can develop a plan for bamboo development. Governments should allocate some funding to inventorying, and working with NGOs and local communities to map out their natural resources is valuable even beyond just bamboo data.

2) **Bamboo growing and management**

There is great need for an improved knowledge base and training in: bamboo growing, seedlings propagation, applying appropriate silvicultural treatments, and dissemination of these results to the field through training and technical extension services. INBAR has been very active and effective in this area.

a) Technical extension

Forests managed by rural communities using the traditional skills passed down over generations are unlikely to be able to compete with the higher productivity of industrial forests, which are more intensively managed. If forests and bamboo are to provide stable incomes for rural communities, they will need an infusion of technical assistance and modernization, as forests and bamboo under traditional management can only generate limited income at a slow pace, which weakens farmers' enthusiasm to manage forests. Anji's experience in China shows how bamboo qualities were improved and higher returns were safeguarded due to the adoption of intensive management technologies. In Anji, the measures taken by the forestry department to encourage the application of scientific bamboo management included:

- Financial support for transforming the low-yield bamboo forests through a subsidy of 750 Yuan per ha,
- technical training and introduction of new technology, and
- establishment of demonstration households, which have had successful experiences (Zhong et al. 1998).

These measures were greatly welcomed by farmers, and result in considerable bamboo quality improvements and an income increase for farmers. Most notably, each year more than 1,400 ha of low-yield bamboo forests have become more productive, and the net income generated from the intensively managed bamboo is 8000 yuan higher than that from the traditionally managed bamboo (Zhong et al. 1998).

In the countries studied, the growers and producers often lack the technical skills needed, largely due to the lack of technicians, funding, transportation and equipment. Thus,

enhancing the capacity of providing technical assistance should be put at the top of the task list for forestry departments.

b) Financial assistance

Apart from the lack of technology in forest management, lack of financial sources is another main difficulty confronted by farmers. Forest dependant people are usually the poorest, and even if land is allocated to them, the initial purchase cost of sampling, tools, and fertilizer are often unavailable, let alone long-term investment in silvicultural treatments. This is why forests and bamboo resources are still managed under traditional methods in many developing countries despite land reforms granting user rights to rural people. Forestland tenure reforms aim to raise income and productivity. However, if there is no financial assistance to help farmers with applying improved silvicultural practices, the targets of tenure reform can never be achieved. The rapid development of plantations in India is largely attributed to the bank loan scheme that allowed farmers to apply intensive forest management practices. In China, the new forest land reform in Fujian recently launched by the provincial government has realized the importance of financial assistance in improving the productivity of forest and bamboo land. Low and no interest loans have been arranged for farmers to apply for by using their forestland tenure certificates as collateral.

3) Bamboo manufacturing and processing needs more technology and capital investment

With the exception of China's relatively advanced bamboo processing industry, there are no modern bamboo industries characterized by high value added products existing in the other countries studied. The common funding is that the traditional handicraft sectors or cottage industries process bamboo products manually and there are no modern tools or equipment involved. In the African countries, most of the bamboo raw material is used without any processing. The bamboo manufacturing and processing sectors have a very low level of technological input during processing, and produce a very limited range of products, all of relatively low value. Most of these low-end products can only be sold locally with little income generated.

China's experience in technology improvement and industry development is useful for other developing countries. China has developed an advanced bamboo industry since the late 1970s and early 1980s when the policy barriers on bamboo forestland tenure, industry, and trade were lifted. At present, China has over 3000 bamboo processing companies engaged in the production of various bamboo based panels, bamboo flooring, bamboo pulping, bamboo charcoal, and edible bamboo shoots. The collaboration between companies, research institutes and universities contribute significantly to improvement of bamboo processing technology. The introduction of foreign investment also helped China to start its modern bamboo industry at an early stage. After nearly 20 years of capital accumulation, domestic investors have replaced foreign investors and now run most of the large-scale bamboo industries (J. Fu, personal communication, April 2006). Strong collaboration should be built among the bamboo industry, universities, and research

institutes to create innovative products and develop improved processing techniques and equipment. Given the poor economic condition all of these developing countries face, favorable foreign investment policies should be created to attract foreign capital to invest in the bamboo industry.

4) Bamboo marketing

Lack of market information is a major obstacle that prevents farmers from gaining more benefits from forest management. Poor education and remote locations limit farmers' competitive capacity, especially compared to the forestry industries that have the advantage of technology, finances, and information. Dissemination of market information by the forestry department will help farmers to build their capacity in entering the market. If farmers gain the proper information about what the market needs and what buyers are willing to pay, they are more likely to make wise decisions in forest management and work in a more efficient way. In Anji, farmers can react quickly to market changes, and respond by changing bamboo species grown as well as the bamboo products demanded. Setting up a local bamboo marketing center in or around the bamboo growing area or processing area would significantly help to build a strong connection between the bamboo growers, processing industries and traders. Regular bamboo fairs at different levels should be held to enhance the dissemination of information on new bamboo product design and bamboo product exports.

Organization of Growers and Manufacturers

Given that many bamboo growers and manufacturers are small in output, individually they lack the negotiating power and resources to effectively voice their issues to the government, to bargain for better prices, and to market outside of their area. Collectively, they would be able to harness their group strength to be more effective in lobbying for their sector.

Forest groups promoted and directed by government officials have not proven to be effective because the members—such as farmers—often have little rights or are excluded from making decisions about management planning, management activities, product use, and income distribution. This may explain, at least in part, why the old-style collective management performed poorly in many cases in China in the past. Available empirical evidence shows that a self-initiating shareholder system created on a voluntary basis, with or without the involvement of government and forestry departments works better.

Grower associations (or grower cooperatives) are recommended. In this system, growers pool their resources to pay for more technical expertise, knowledge exchange, hiring loggers, forestry technicians and also marketing representatives to negotiate prices with buyers. This kind of cooperative has emerged in China since the 1980s, which allows farmers to continue to manage their own land, but to also receive support services from their joint cooperative through agreeing to pay a commission of 10% of their gross revenue to the cooperative. In countries like the Philippines where bamboo growers lack

incentives in bamboo cultivation because of the lower prices paid for bamboo raw materials by middlemen or traders, associations can offer greater output volume to buyers, and this gives them more negotiation power by pooling bamboo resources.

The formation of regional and national associations will create organizations that can look after the interests of the bamboo industry. They can organize training and trade fairs, advance the diversity of bamboo products for export markets, establish bamboo product quality standards, test new products or conduct consumer surveys, implement quality control standards, unite small household producers into medium scale cooperatives, coordinate with government agencies in formulating favorable bamboo manufacturing policies with regard to export and import regulations, lobby for policy reforms, build a marketing network and provide marketing and production information.

Create Partnerships between the Public and Private Sectors

In transitioning from a system where the state has sole authority and control over bamboo tenure, production and marketing, it is advisable to seek new power-sharing arrangements in which individuals and organizations representing the government, NGO, community, and private industry work together on common goals. For example, a new research institute on bamboo could be a jointly sponsored project to enhance technical know-how. In addition, since the African countries studied in this report cannot on their own provide sufficient capital for bamboo development, it is necessary to work with NGOs, donor agencies and technically advanced countries to transfer technology to local growers and producers.

Enhancement of Law Enforcement

Law enforcement is deeply influenced by the system of forestland tenure. In all the countries in this study, forestland tenure has been characterized by the strong concentration of power over forest resources in the central state apparatus, and the corresponding lack of local access to forests and participation in forest management. Centralized forestland tenure policy that is not backed with enough resources to enforce its rules has led to the condition where most forests are de facto open-access resources (Banana and Gombya-Ssembajjwe 1998). Available empirical evidence shows that individuals who lack secure rights to continued use of forest resources are strongly tempted to use up these resources before they are lost to the harvesting efforts of others. Thus, optimal forest tenure arrangement characterized by transferring the ownership or long-term user rights to the local people will reduce the pressure on law enforcement. Where a system of property rights is well-known and well accepted by the local population, the condition of forests is better than in those areas where locals play no part in forestry management (Banana and Gombya-Ssembajjwe 1998). However, a good tenure arrangement regime is not a panacea to address all the problems in forest management. If the policies are wrongfully implemented, further conflicts will be created. Thus, strong enforcement of law will guarantee the reform is moving forward in the

designated direction. As mentioned above, introducing due process at the village level can prevent the misuse of powers by the village leader. The effective oversight of tenure arrangement process by the law enforcement agencies is as important as the internal supervision system conducted by the general body of the village. Furthermore, with the authority of law enforcement, the actions taken or the penalties made by the agencies are more likely to influence the behavior of individuals. Therefore, the government should input more funding and carry out more training to improving the capacity of law enforcement.

Summary

Bamboo has become a potential substitute resource to produce non-timber forest products that can help sustain forest dependent communities as well as provide environmental benefits to the forest. Policies to improve bamboo development, management, and marketing should be a priority for developing governments. Yet most countries lack specific guidelines on bamboo, including tenure policies. The problems facing bamboo tenure in developing countries are the same as those facing forestland tenure, and these are closely bound with the problems inherent in countries with limited financial resources, huge numbers of marginalized rural poor and an inconsistent history of participatory management. This report cannot address all of these complex issues, but it attempts to provide an overview of tenure reforms and bamboo development in seven countries in Asia and Africa, and suggestions for further progress. For example, the success of bamboo tenure reform initiatives such as in China's Anji County, offers some useful lessons for other Asian and African countries that have abundant bamboo resources but manage them inefficiently.

For political and social stability, it is imperative that the wealth of rural people must also advance. Yet even in wealthy countries such as the US (see appendix), small family forest owners still face a lot of problems such as access to markets, technical expertise and financial hardships. Clearly, the problems facing tenure reform are significant and on-going, but reform is necessary in many countries, and it should begin with recognition of the need for reform and the political will to really do something about it. If policy makers clearly realize the problems facing bamboo tenure and are willing to take actions to address them, the improvement of bamboo management and poverty alleviation are attainable.

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Appendix: The United States

Tenure in developed versus developing countries exhibit important differences, but there are still lessons worth learning from the experience of countries such as the U.S., where small woodland owners are still an important part of forest ownership. About two-thirds of forestland area in the U.S. is privately owned, a huge difference from India and China, where nearly all land is publicly owned. About half of these private lands are owned by “family forest owners,” who own forestland for a variety of reasons, including timber income, recreation, family inheritance, hunting, etc. More surprisingly, an increasing share of commercial timber harvests is coming from private lands, including family forests.

In the U.S., the land tenure system is more commonly referred to as “forest ownerships,” because unlike in China, land can be directly owned by private individuals, corporations and foreign entities. Thus for this chapter, the U.S. forest tenure system will be referred to in terms of who owns the forest.

Status of U.S. Family Forest Owners

The experiences of small woodland owners in the U.S.—often referred to as family forest owners—offer valuable lessons in how government regulations and free market mechanisms can impact productivity on forestlands. Given the interest in China and elsewhere to improve productivity on bamboo forestlands using a mix of free market and government incentives, there are lessons that can be learned from the American experience. For this reason, the understanding of how small woodland owners in the U.S. operate, the challenges they face in trying to stay sustainable and solvent, and what impact government policies have on family forests is very important.

The size and importance of family forests cannot be underestimated. There are an estimated 620 million acres of forestland in the United States and nearly two-thirds, or 393 million acres, is in private ownership. Private owners include forest industry companies, other businesses or corporations, partnerships, tribes, families, and individuals. Family forest owners constitute the dominant ownership, holding 4 of every 10 forested acres (Butler and Leatherberry 2004). This covers an area larger than the states of Oregon, Washington, California, and Idaho combined. There are over 10 million family forest owners, mostly owning small tracts of land. Ninety percent of family forest owners own less than 100 acres. In the last 10 years, more private forestland has transferred ownership, with some 24 million acres shifting from business or other non-family ownerships to family forest owners.

Figure 1: Public and private forest ownership in the United States in 2003 (Butler and Leatherberry 2004)

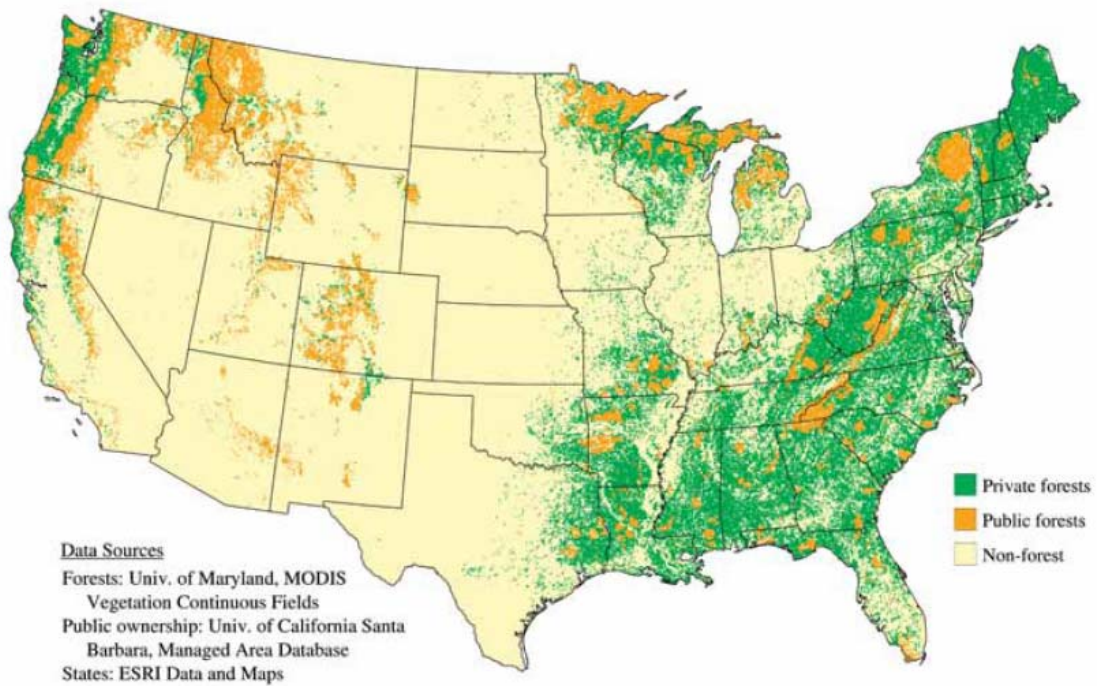


Figure 2: Timberland ownership in the United States (Collins 1999)

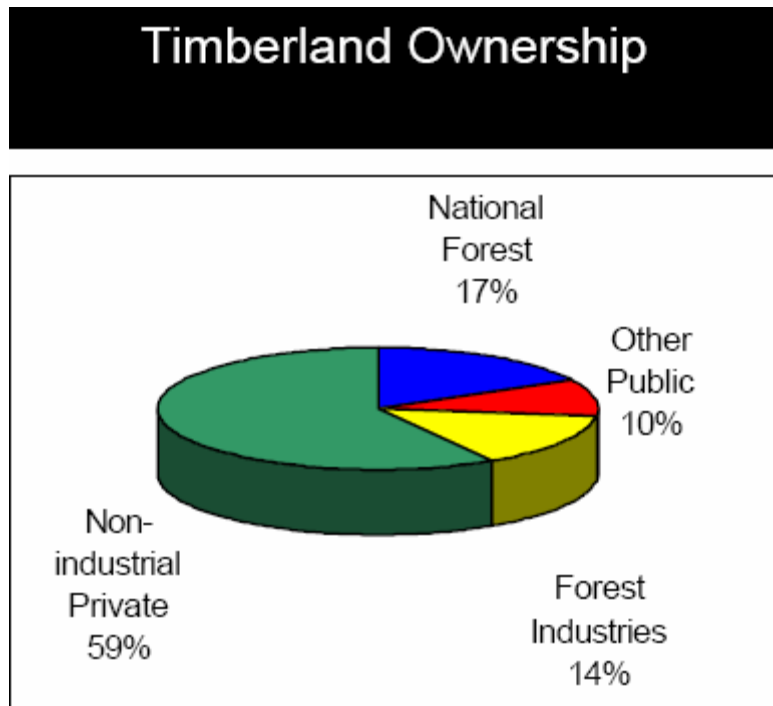
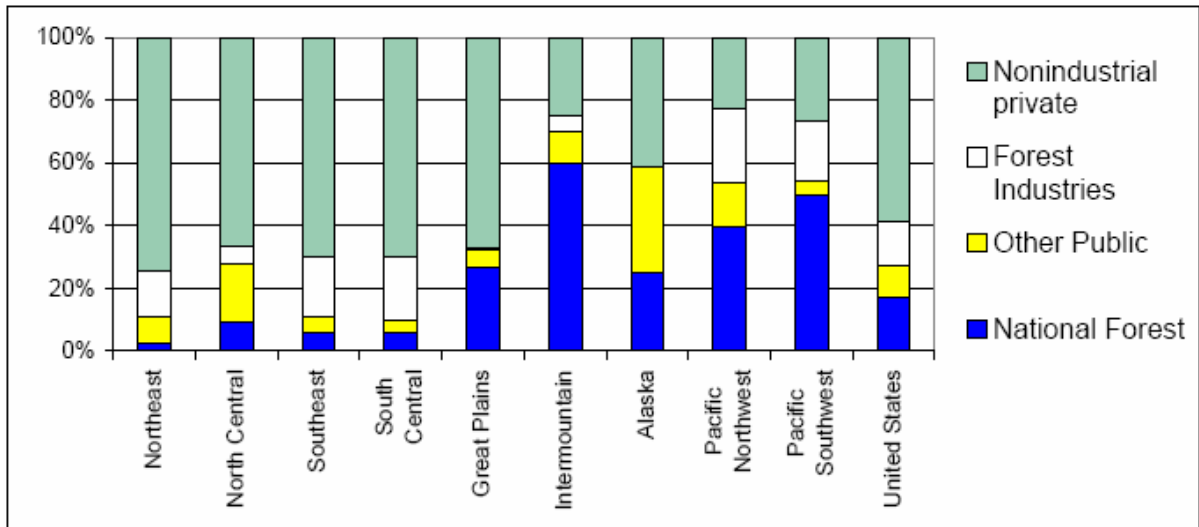


Figure 3: Timberland ownership by region and sector (Collins 1999)



While their individual sizes are small, their cumulative contribution to economic production is significant. Taken together, family forests account for about 220 million acres of forestland (Hogdon and Tyrrell 2003). Studies suggest that their numbers are growing, although average land holdings are shrinking as lands get fragmented. In the last decade, timber harvests from private timberlands in the U.S. have grown, substituting for the steep decline in U.S. government harvests on federal lands. Thus the role that private family forest lands play in providing timber to the forest industry has grown substantially. In Oregon, timber harvests from family forestlands have doubled since 1995 (Collins 1999; Hodgon and Tyrrell 2003).

Figure 4: Oregon's timber harvest from 1962-2004 (ODF 2005)

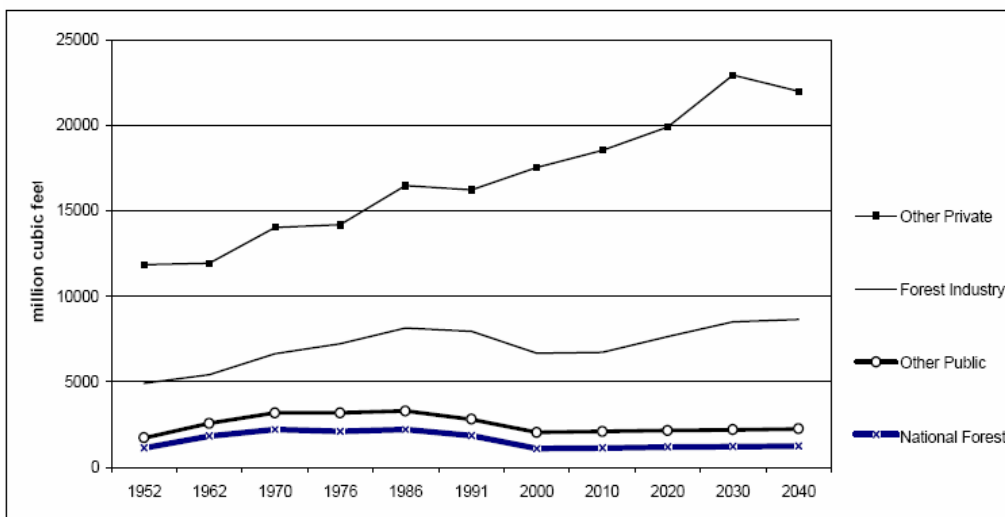
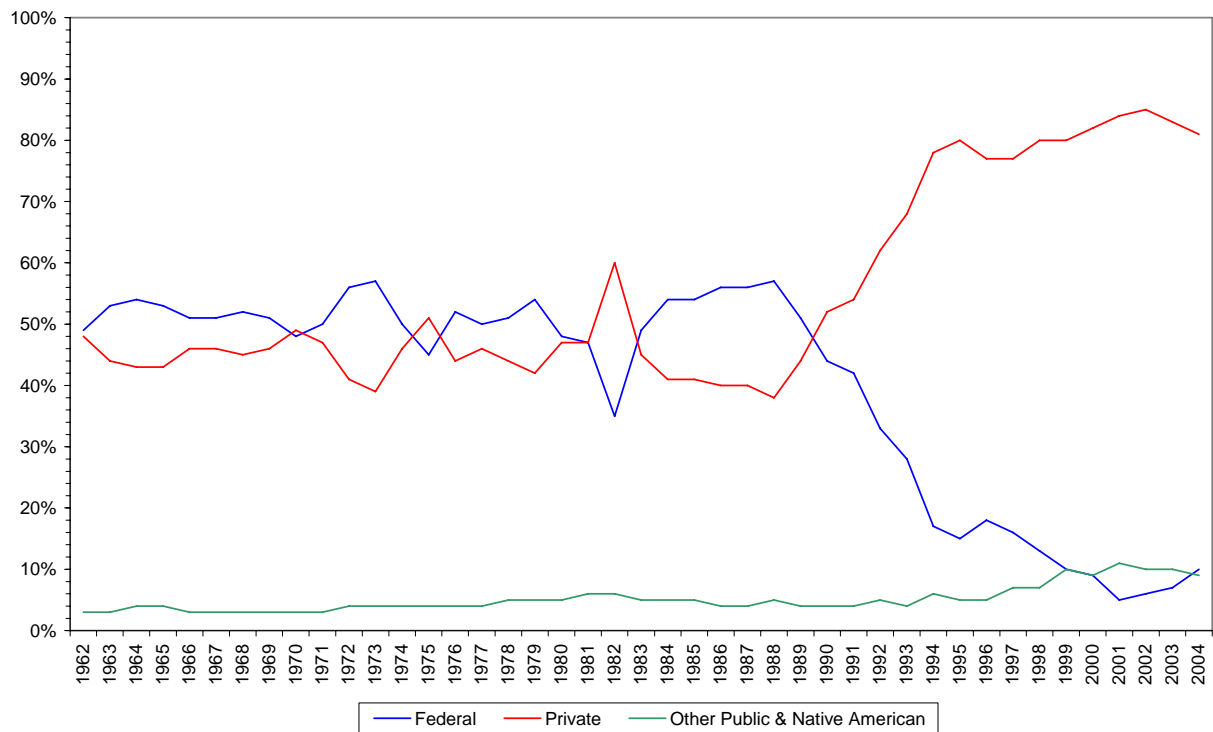


Figure 5: Changing shares of timber harvests in Oregon from 1962-2004 (Collins 1999)



Family forest owners play an important role in supplying the public with timber, outdoor recreation opportunities, and watershed protection. Privately-owned forestlands supply nearly two-thirds of the nation's drinking water. Family forests result in jobs and healthy economies in rural areas. Recreation, tourism, hunting, fishing, and forest products bring income to family landowners and the communities in which they live. Clearly the history of family forest ownership in the U.S. provides many positive lessons in how a private land sector, with relatively small financial resources, is able to thrive. Yet at the same time, family forests in the U.S. are facing some daunting challenges (Birch 1996, Butler and Leatherberry 2004, Bliss 2003).

Challenges Facing U.S. Family Forest Owners

To better understand the factors that affect the U.S. and management of private forestland, private forest owners have been surveyed periodically by the U.S. Forest Service (Butler and Leatherberry 2004). These national surveys were completed in 1978 and 1993. In 2002, the U.S. Forest Service initiated a new system of annual surveys of the nation's private forest owners, called the "National Woodland Owner Survey." These surveys provided statistical data supporting what many in the forestry community already knew—that family forests in America were changing, and that although more families than ever were becoming forest owners, the individual forest sizes were shrinking and management

goals were also changing in ways that could potentially, in the long-term, accelerate forest loss and fragmentation.

Fourteen NGOs and family forest groups recently issued a joint statement entitled “Family Forests Facing Increasing Risks,” in which they listed the following as their top concerns for the issues threatening the future of family forests (NASF 2005):

- (1) *Increasing Development Pressure.* Forests are lost forever once they are converted to development. From 1963 to 2002, the U.S. experienced a 13 million acre net loss in forestland to nonforest uses. An estimated 44.2 million acres of private forestland are projected to experience substantial increases in housing density by 2030.
- (2) *Shrinking Size of Forested Tracts.* As the tracts of family forestlands become smaller and more fragmented, their ability to provide important ecological services, such as clean water and suitable wildlife habitat, decreases. Further, as the number of landowners grows, the resources available to help family forest owners become increasingly scarce. The average age of family forest owners is over 60 years. Consequently, a significant portion of family forests will soon change hands, from current owners to heirs or new owners – often splitting forests among several heirs or selling smaller parcels to other owners.
- (3) *Minimal Land Management Planning.* Management planning helps families make a long-term commitment to the land. Yet current estimates suggest that only 3% of family forest owners have a written management plan.
- (4) *Harvesting without Professional Advice.* Without professional management advice, family forest owners may engage in management practices that degrade the quality and productivity of their land for years to come. Only 22% of family forest owners have sought professional advice prior to timber harvesting on their lands.
- (5) *Declining Forest Health and Ecological Values.* Unhealthy forests can lead to degraded water quality and wildlife habitat and limited opportunities for recreation. Family forests are threatened by invasive species, insects, diseases, and wildfire threats. Family forest owners often lack financial and technical resources needed to treat their land and minimize these problems.
- (6) *Reduced Income Opportunities.* Without income from their lands, families find it difficult to resist development pressures. Today, globalizing markets and other factors reduce opportunities for families to sell products and get income from their lands.

What Can be Learned from U.S. Government Policies?

The U.S. government had its own response to the results of these surveys. The U.S. Forest Service reiterated the public's interest in private forestry as being grounded on two fundamental concerns (Kilgore 2004):

- (1) Encouraging continued investment in land management for a wide range of benefits provided by private forests. The long-term nature of forestry and lack of markets for many of its products tend to discourage landowners from investing in their forests, so one key role of government is to develop regulations that provide these incentives.
- (2) Minimizing negative impacts that can be associated with forest management and timber harvesting activities, such as the loss of wildlife habitat, diminished water quality, soil erosion, and reduced visual quality. Recognizing that many non-timber forest services are public goods which the free market does not currently value as well as it should, an important role for the government is to protect these public goods from being over-exploited by the private sector.

These two roles for government are arguably true in any country, including China, India and Tanzania. In countries like China and India, where the governments are experimenting with wide-ranging economic reforms and liberalization, the government has an added responsibility to balance reforms with the need to transition carefully into more market-oriented systems, as it may damage rural and low-income households disproportionately.

The United States' policy on family forestlands has focused on the following policies (Kilgore 2004):

- Developing and delivering to landowners information and education programs on proper stand establishment, management, and timber-harvesting techniques;
- Assisting owners who wish to apply certain land management practices by providing technical assistance and advice;
- Identifying appropriate forest management and timber harvesting techniques such as best management practices or guidelines;
- Providing financial incentives in the form of cost sharing, no or low interest grants or loans, and income and property tax incentives to encourage the application of certain forest management practices or production of forest-based outputs;
- Purchasing specific rights (typically development) from willing forest landowners;

- and regulating and zoning the extent and types of practices and activities allowed on forestland.

Some of these policies can be found across multiple levels of government (e.g., taxation), while others are the exclusive domain of certain levels of government (e.g., state governments typically have jurisdiction over the regulation of forestry practices on nonfederal lands).

It is worth noting that state and federal governments in the U.S. recognize that although they have an important role to play, there is only so much they can do (in competing with market forces) to effect policies that influence the behavior of family forest owners. For example, a government policy of tax incentives that give forest owners a few extra dollars per acre may not be able to compete with a large financial sum offered by commercial property developers to forest owners to convert their property into new housing.

Another important point is that the first policy listed by the government is delivering educational information to forest owners. That is, the government tries to “level the playing field” by providing family forest owners with the technical and market information they need to adequately manage and compete in the marketplace. This need is particularly important in countries where the economic and political systems are not transparent and information is difficult to obtain (as is the case in India and China) (Khare et al. 2000, Grinspoon 2002).

Finally, it is illustrative to note that the last policy point states that the government will purchase lands, *where possible* (i.e. from willing forest landowners), in contrast to confiscating the land for public use. This is a critical point, since the taking of private lands necessarily raises the insecurity of land tenure. In many countries outside the U.S., land confiscation by the government is common. For example, in India, despite recent land reforms easing private investments, it is clearly stated that it remains within the domain of the government to confiscate lands leased to private investors if the government is dissatisfied with the pace of investment, or management and use of the land. Such policies, while intended to protect public land rights, inevitably have the effect of chilling private investment in forestry.

The private NGO sector also plays an important role in initiating land exchanges, where private forest lands are purchased by NGO land trusts to manage for conservation and other uses. Thus where the government may lack the needed funds to purchase lands, the NGO sector may fill the gap. While the NGO sector in many developing countries remains in its infancy, it is possible that in the future NGOs could play a similar role in acquiring land that would otherwise be converted into non-forest use (J. S. Walia, personal communication, December 2005).

Summary:

This review of the small woodland owner situation in the U.S. provides some illustrations of the role that government can play within an active free market system to protect forests and to provide incentives for continued investment in forests. Although the U.S. is economically much richer per capita than the developing countries, it is clear that the US model of government interaction with the free market system and with NGOs offers lessons for countries attempting to incentivise economic production of forest products on small land holdings.

In a 2004 congressional hearing on Forests and Forest Health, the head of the American Forest Foundation, Mr. Chuck Leavell, testified that government should be “sparing with regulation. Some folks believe you can simply force people to be good stewards. Trust me. It doesn’t work that way; people have to want to do it.” This sentiment should be heeded (COR 2004).

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