

Socio-economic changes and sacred groves in South India: Protecting a community-based resource management institution

M.G. Chandrakanth, Mahadev G. Bhat and M.S. Accavva

Abstract

The sacred groves along the forest belts of south India, which were traditionally managed by village communities, are gradually disappearing. This study conducts an analysis of how this community-based resource management institution has evolved over time and what socio-economic factors have caused its gradual disintegration. Commercial agriculture, changing demographics and weak property-rights systems are found to be some of the enabling factors. While the grass-roots enthusiasm to save the sacred groves is still alive, government action is needed to strengthen the traditional village organizations, which are still perhaps in the best position to manage local resources. Several economic and financial incentive mechanisms at the local level that might lead to more efficient and equitable resource use outcomes are suggested.

Keywords: Sacred groves; Forest policy; Property rights; Common property; Market forces; Coffee; India.

1. Introduction

Protecting nature for religious reasons is an ancient practice in many traditional societies. Sacred groves in India — parcels of uncut forest vegetation in the name of certain deities or natural or ancestral spirits — exemplify such practice. As a model of community-based resource management, sacred groves have lately gained attention in conservation literature. Gadgil (1985) recognizes the sacred groves as a system that informally forces traditional communities to harvest natural resources in an ecologically sustained fashion. Some researchers believe that sacred groves hold potential for preserving not only biodiversity and ecological functions, but also cultural diversity (Gadgil and Vartak, 1975; Gadgil and Chandran, 1992; Pandey, 1998; Ramakrishna *et al.*, 1998).

Sacred groves embody a rich repertoire of forest preservation practices and share characteristics with common property resource systems. Their size ranges from clumps of a few trees to several hundred acres. Traditionally, sacred groves have been valued for their embodied spiritual and cultural attributes. There is a deep connection between

sacred groves and religion. For instance, in India, as Chandran and Gadgil (1998) observe, Hinduism has grown out of the merger of numerous local religious traditions that were intertwined with nature. Hindus commonly worshipped natural objects, including trees and groves. According to Brosse (1989), many temples originated from sacred groves. Deep religious reverence for nature, rather than resource scarcity, seems to be the basis for the long-standing commitment to preserving these forests (Ramakrishnan, 1996). From her study of *devabans* of Kullu in India, Vasan (2002) opines that this traditional institution may not represent the existence of ecological consciousness, but certainly offers lessons for current resource management.

In recent years, however, multiple and incompatible uses of sacred forests have surfaced, destabilizing their institutional foundations and existence all over India. Agricultural expansion and human settlement are slowly encroaching on sacred forests. In many places, the institutional identity of these traditional forests is fading with the advent of new national forest policies (Chandrakanth and Romm, 1991). Particularly, the Indian Government had nationalized many forests around the country. In this process, the Government has taken the land rights of sacred groves away from local communities.

At this time, the conservation of sacred groves in India therefore faces several management questions. What are the circumstances that led to the decline of sacred groves as community-based resource management institutions? What socio-cultural and market factors now threaten the existence

M.G. Chandrakanth is Professor and M.S. Accawa a graduate student at the Department of Agricultural Economics, University of Agricultural Sciences, GKVK, Bangalore, India.

Mahadev Bhat is Associate Professor at the Departments of Environmental Studies and Economics, Florida International University, Miami, Florida. E-mail: bhatm@fiu.edu.

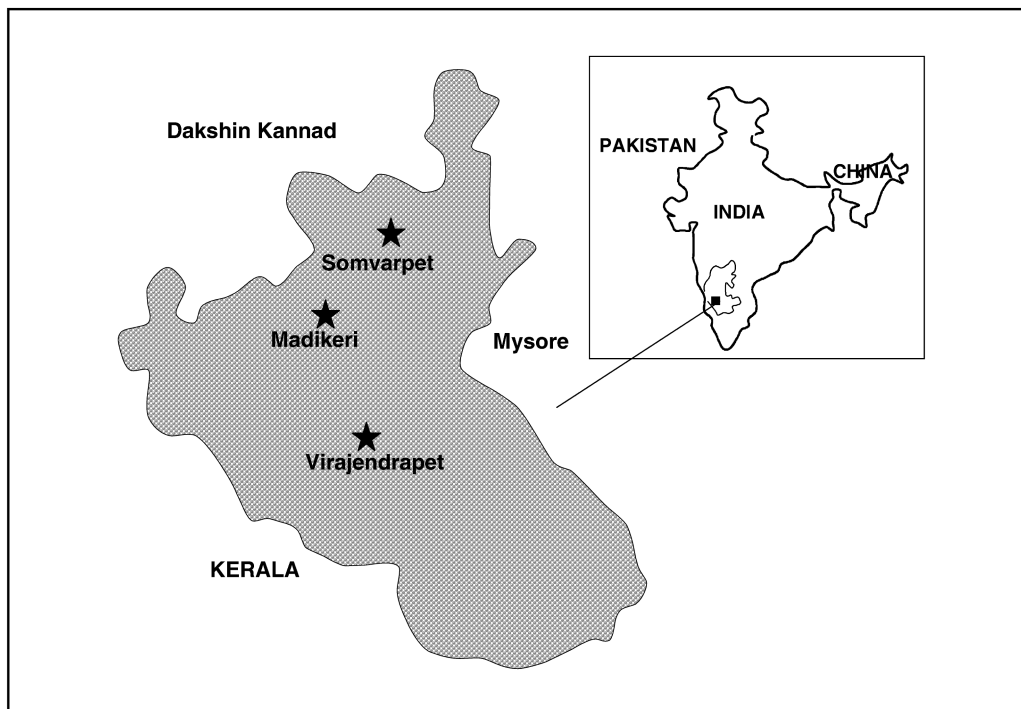


Figure 1. The study area map of Kodagu district, Karnataka, India

of sacred groves? How do the land-tenure and resource management laws of the country speed the process of institutional disintegration? What social value systems are still alive and able to justify continued efforts to rescue sacred groves? What management measures are necessary to reverse the loss of sacred groves?

By focusing on a case study of religious forests in the Kodagu District, Karnataka, South India, we address the above questions by examining the evolution of sacred groves as an institution. More specifically, we investigate how property rights regimes governing sacred groves and adjacent properties have changed over time. We look at the social, ethical and legal norms that underlie the governance of traditional sacred groves. The article further analyzes the socio-economic drivers in the modern era that have weakened traditional management systems. An attempt is made to identify the outcomes of these institutional changes in terms of resource use efficiency, equity and sustainability. Finally, we recommend policy changes that would fortify sacred groves in a changing political and economic situation. An analysis of sacred groves in different parts of India is beyond the scope of this paper and has been done elsewhere (Ramakrishnan *et al.*, 1998; Pandey and Kumar, 2000; Pandey, 1998; Seeland, 1997; Vasan, 2002; Upadhaya *et al.*, 2003). Instead, we focus on issues specific to a representative region, allowing for a more in-depth analysis of the underlying factors of change. The study approach, analysis outcomes and management insights of this research should be applicable to sacred groves in other parts of India as well.

2. Study area and methods

2.1. Study area background

Kodagu is located in the Western Ghats, India — an international biodiversity hotspot. It is bordered by the state of Kerala in the south and southwest, by the Mysore District (Karnataka) in the east, and by the Mangalore District (Karnataka) in the north (see Figure 1). Cauvery, the river that supports the life system in the states of Karnataka and Tamilnadu, originates from Bramhagiri in Kodagu. More than 97% of the river is utilized for agriculture and drinking water. In addition, Kodagu is the watershed for several perennial rivers. About 33% of the total geographic area of over 410,000 ha is covered with forests, and almost an equal area is filled by coffee plantations (Bhagwat, 2000) (see Table 1). The study region receives a rainfall of 2,840 mm per year. Coffee, cardamom, rice and ginger are commonly grown crops.

In the local parlance, a sacred grove in Kodagu is called a *devarakadu* (*devara* = God's and *kadu* = forest). The precise number of *devarakadus* and their combined total area are not known. According to Kalam (1998), there were 1,214 sacred groves covering a total area of 2,520 ha in 1980, which amounted to 0.6% of the district's land area. In the 1900s, more than 30 groves were larger than 20 ha, with a couple of them more than 200 ha (Meiklejohn, 1900). Forests of this region are semi-evergreen and evergreen replete with tree species such as *Canarium strictum*, *Vateria indica*, *Mangifera indica*, *Dalbergia latifolia*, *Artocarpus*

Table 1. Levels of species richness on various land-use types in Kodagu District

Item	Coffee plantation	Government reserves & parks	Sacred groves
Total land area of the district (ha)		410,775	
Area under different uses (ha) ^a	134,597	135,555	2,520 ^b
(% of total land area)	(32.8)	(33.0)	(0.6)
Number of study sites ^c	25	10	25
Number of species:			
Trees	32	77	72
Birds	18	12	20
Mushrooms	20	33	41

Notes^a Approximate figures.^b Source: Kalam (1998).^c Source: Bhagwat (2000).

heterophyllus, *Santalum album*, *Ficus glomerata*, *Bamboosa arundinaceae*, and several other native trees. The Nagarahole National Park is located in this district and houses elephants, tigers, bears, deer, and reptiles. Based on a recent field study, Bhagwat (2000) reports an interesting comparison of biodiversity between sacred groves, reserve forests, and coffee plantations in the district. Even though sacred groves occupy an insignificantly small portion of the total land area, they are biologically more diverse than the two dominant land-use categories (Table 1). She observed 72 plant species, 20 bird species, and 41 types of fungi only in a few selected sacred groves. *Ficus* trees are considered key resources, providing habitat for many insects, birds, and mammals (Terborgh, 1986). Describing the biodiversity of the Western Ghats, the larger region to which the Kodagu sacred groves belong, Martin (2002) reports that at least 4,050 flowering plants can be found in the Ghats. According to him, large populations of reptiles, such as limbless frogs (caecilians), burrowing snakes (uropeltids), and the king cobra are present here. In total, 112 endemic species of salamanders, caecilians, frogs and toads are known to exist in the Western Ghats. A variety of medicinal plants also are found in the Kodagu forests (WWF, 2002). Plants such as *Ageratum conyzoides* and *Jatropha curcas* are used for curing wounds, *Ervatamia heyneana* (Apocynaceae) for treating respiratory disorders and snakebites, *Ardisia solanacea* for acute dysentery in infants and livestock, and *Memecylon umbellatum* for hepatitis.

Sacred groves are located on plains, hill slopes or hilltops. They play an important ecological role in soil and water conservation, reduce erosion, and provide rich humus to cultivated fields (Nagaraj, 1993). In a study of sacred groves elsewhere in the Western Ghats, Chandran and Gadgil (1998) note that the thick vegetation cover of sacred groves reduces the flow of runoff water and holds several inches of rainfall in the soil. Springs, ponds, and lakes are common in sacred groves. Because traditionally,

direct extraction of forest products rarely occurs on this land, sacred groves form a mosaic of sustainable forestland parcels scattered all over the district. Groves themselves provide a rich habitat for wildlife and are a repository of diverse flora and fauna.

2.2. Study techniques

We have adopted a case-study approach and carried out a descriptive analysis of the evolution of formal and informal institutions that govern the sacred groves in the study region. Information was drawn from personal interviews, expert consultation, literature review, and field visits. A survey of 80 coffee planters and 17 temple committee members was carried out in 2001. Over the years, we also conducted interviews with government officials, academics, and representatives of non-governmental organizations in the area. During these interviews, visits to several sacred groves were made to casually inspect forests, temples, plantations, and ancestral homes of villagers.

In the surveys of planters and village committees, we inquired about issues regarding property rights, government regulations, the nature of current use, family and cultural connections, and attitudes toward the protection of sacred groves. Moreover, a hieroglyphics expert was consulted to help understand the royal proclamations carved on temple walls in some sacred groves. These proclamations yielded key information about the origin of traditional land tenure systems and the village governance of *devarakadus*. The primary information collected through household surveys and expert interviews has been supplemented with secondary information drawn from literature, to study the evolution of the *devarakadu* institution and its current legal and social status.

3. Sacred grove management in Kodagu: Past and present

3.1. Tradition, belief and organizational structure of sacred groves

There are two types of management system in the study area: family-owned *devarakadus* and community-managed *devarakadus*. The preservation of a large number of family-owned *devarakadus* is largely due to the intertwining of the sacred groves with two major family institutions. A majority of the Kodagu village families have an ancestral house, called *iyenmane* in the vernacular (*iyena* = originator of the family; *mane* = home), and a memorial of the family originator, called *kaimada* (*kai* = small; *mada* = temple). In many cases, a parcel of forest is maintained around the *kaimada* as hunting ground of deified heroic ancestors (Government of Coorg, 1870). Nagaraj (1993) reports that about 80% of these ancestral homes and memorials have been preserved. In about 70% of the cases, the family

descendants reside in the *iyenmanes*, while the rest are simply maintained as memorials.

The *kaimada* generally consists of a stone symbol or icon housed in a small temple-like building. *Kaimadas* are built close to the farmland so that every time a family member visits the farm, he or she will have a chance to pray. In the month of October, the people of Kodagu celebrate the birth of the river Cauvery. As a part of this celebration, villagers make wreaths (called *botthale*) out of leaves collected from their village *devarakadu*. The wreaths are made with reverence and kept in the *iyenmane*, by the well, in the rice paddy and the coffee fields, and near the *kaimada*, as sacred symbols. Similarly during the *Huttari*, the festival celebrated for expressing gratitude to God for a good harvests, the institutions of *devarakadu*, *iyenmane* and *kaimada* are linked. Thus, the sacred groves in this district are part and parcel of a larger village institution, and played a key role in sustaining not only the forest resource, but also an age-old folk tradition. Particularly, the faith in the *kaimadas* located in sacred groves holds promise for the survival of the sacred grove tradition.

The community *devarakadus* were established at different times in history for the common good of villagers. Some were originally instituted by the rulers of the district during their reign. Ancient inscriptions found on temple walls, pillars and in other places give evidence of such royal patronage.¹ For instance, the Madikeri inscription, dated around the 5th century AD, describes the maintenance of the tank and growth of sacred trees around Sri Vijaya Jinalaya — a Jain temple.² A sacred tree has been planted to the south, southeast, northwest, and east of the temple, tanks built in the east and southeast, and medicinal herbs planted in the western, southern, and easterly directions. The Irpu inscription of 1840–1841 indicates donations of 52.63 ha of *devarakadu* by the people of Kiggattu Hath Nadu.

Each sacred grove is looked after by a temple committee consisting of local rural families. These committees are mostly informal and take responsibility for festival fund raising; organizing festival activities; proper disbursement of funds contributed by devotees during the festival; securing encroached lands that belong to the temple, and operating and maintaining the grove sanctum. Table 2 presents various forms of sacred groves, their institutional set up, and cultural significance. It is evident from the table that most sacred groves are common property resources while a few are privately owned.

3.2. Property rights in sacred groves

A property right to a resource is generally expressed as a 'bundle' of separable rights that include right to own, right to use, right to dispose of and right to exclude. In the

literature, four types of property rights are identified, namely, private, community, state and open-access rights (Bromley, 1989; Hanna *et al.*, 1996). Some of the sacred groves such as *kaimadas*, *muthappa* and *nemmale* are privately owned (Table 2), and these may not be in much danger. The land ownership rights to the community *devarakadus* is vested in the state government. The State Revenue Department has the overall responsibility of maintaining land records, issuing records of rights to the holders, and for conducting the survey. The State Forest Department's duties consist of forest conservation, preservation and development. This department has the executive responsibility and manpower to oversee forests. However, neither of these departments has effectively enforced the state's property rights against illegal encroachment. In villages where the temple committees are strong, the communities themselves have used their collective power to enforce the state's property rights (Chandrakanth and Nagaraj, 1997).

The institutional arrangement for the actual management of the sacred groves on state-owned forestland best fits the description of a common-property regime. By definition, common property represents private property for the group.³ The members of the group have both rights and duties with respect to the nature and levels of use, and the maintenance of a given resource (Bromley, 1989). Through mutual understanding and centuries of practice, each village community in Kodagu has defined members' rights and responsibilities. For instance, individual family members are not allowed to encroach upon or destroy sacred groves. Even children are prohibited from removing tree branches or other products from the groves. The community as a whole may extract timber only for temple construction and repair. In some cases, small portions of sacred groves have been cleared for coffee and cardamom cultivation, while crop proceeds are being used for temple maintenance. Generally, even a naturally fallen tree is left to decay by itself, but not collected. Minor forest products, such as leaves and fruits, may be collected for ritualistic uses in the temple. Certain medicinal plants, unique to sacred groves, might be extracted only with the common consent of the village (Nagaraj, 1993, p. 261). Actions that violate these rules are considered to be as sinful as killing children. Traditional people believed that the punishment for such crimes would be to be reborn as urchins for thousands of years.

The real problem in managing sacred groves arises from the mixing of property rights regimes, when legal ownership and operational control are held by different entities. The two entities in question, the state and the community, vary in their policy norms and underlying motives for using the sacred grove. For instance, the temple committees are not fully aware of the *de jure* areas under sacred groves. In

¹ Personal communication with M. C. Nagaraj.

² Jainism is one of the religions in India.

³ Before most of the today's sacred groves became state-owned properties during the British rule in India, these groves were strictly under the control of the village communities.

Table 2. Types, significance, and management regimes of sacred groves of Kodagu District, India

Type of <i>devarakadu</i>	Description	Purpose	Management regime
<i>Kaimada kadu</i> or <i>Karona kadu</i>	A forest around the altar where the family ancestor was cremated. A memorial housed in a small building. In some cases, an anthill is worshipped as ancestral memorial. Forest land up to 2 ha may be dedicated to the memorial. E.g., Machangala <i>kaimada kadu</i> , Kottageri, Balele.	To appease ancestors. If the forest is large in size, this site is sometimes also used to cremate other members of the same family.	Private property
<i>Paisari devara kadu</i>	Dedicated to a specific Hindu deity, such as <i>Iyyappa</i> , <i>Bhadrakali</i> , <i>Mahadevaru</i> , <i>Igguthappa</i> , and <i>Bhagawathi</i> . Size ranges from 1 to 1,000 acres.	A sacred grove festival is conducted every year to appease the deity and to obtain good harvest, hunt, and family prosperity. In some sacred groves, earthen models of tigers, hunting dogs, horses and elephants are offered as a token of traditional offerings of animal sacrifices.	Common property
Privately managed sacred grove	Individual families maintain their sacred grove usually of small size from 1 to 5 acres. For example, Muthappa sacred grove and Nemmale sacred grove.	To appease the deity and to obtain good harvest, hunting, and family prosperity. A patch of forestland on the farm is dedicated to a deity.	Private property
<i>Basadi kadu</i>	Forests dedicated to Jain temples. The inscriptions of 5 th , 9 th and 10 th century AD in Kodagu make reference to these forests. Size range 1 to 5 acres.	Trees in these sacred groves represent various <i>thirthankaras</i> (i.e., Jain gurus).	Common property
<i>Hole devarakadu</i>	Sacred grove of 0.4 ha to 2 ha maintained exclusively by scheduled castes or tribes such as the Kembatti tribe, the aboriginal community of Kodagu.	For appeasing the goddess <i>Pannangala Thamme</i> and be blessed with prosperity. Upper caste Hindus also participate in this sacred grove festival.	Common property
<i>Suggi devarabana</i>	Maintained by the farming community for worshipping the village god (<i>grama devatha</i>) or the harvest goddess. Size varies from 0.4 ha to 2 ha in size.	The annual harvest festival is conducted here as a token of gratitude to the Almighty for giving a rich harvest.	Common property
<i>Mutt kadu</i>	Maintained by religious institutions of the <i>veerashaiva</i> faith. Size ranges from 2 ha to 4 ha for appeasing the goddess Chowdamma.	Occasionally for the maintenance of the governing religious institution, timber resources of the <i>mutt kadu</i> are utilized.	Common property
<i>Palli kadu</i>	Worshipped by <i>Jamma Mapillais</i> , who were originally Hindus but converted to Islam during the reign of Tippu Sultan. They have <i>jamma</i> lands allotted during the reign of the Haleri kings. Most rules for sacred groves also apply to these.	Some of the <i>palli kadus</i> , are also treated as <i>khavarasthan</i> — burial grounds. In some others, Arabic schools have been built for imparting religious teaching. During the <i>Huttari</i> (a harvest festival), the deity is adorned with paddy panicles as in the sacred grove tradition.	Common property

the case of illegal encroachment, committees are often times unable to even determine the extent of encroachment. Further, the state government has its own limits in terms of regulating sacred grove uses. The sacred groves are designated as reserve forests by the government in consonance with the overall secular principles of states in India.⁴ The secular basis of forest classification prevents the state from recognizing sacred groves only for religious purposes. In

some instances, the state government is required to allow building homes on reserve forests for the homeless and landless poor. Thus, the mixed property risks regime has created a rift between the state and the communities in the management and use of sacred groves.

3.3. Agricultural land tenure

The land tenure system of the agricultural lands in Kodagu plays a significant role in protecting the folk tradition and sacred groves. During the 18th century, the Haleri dynasty that ruled the district awarded tenure of certain public lands to Kodagu families in recognition of their services to the kingdom in various capacities. Under this tenure system, farmers have limited property rights to the land, in that they can use land for legitimate agricultural purposes but

⁴ Kalam (1998) reports that in 1987 sacred groves were declared as protected areas and were under the control of the State Forest Department. In 1905, the Revenue Department took charge of sacred groves. In 1985, the sacred groves were brought back under the control of the Forest Department, but as reserve forests. During this 80 year time period, the total area under *devarakadus* shrank from 6,202 ha to 2,520 ha, i.e., a reduction of 59%.

are allowed to sell lands only to those who are born in their own *manepeda* (family of the same ancestral origin). This system is referred to as *jamma* (meaning ‘right by birth’). This is an example of administrative traditions that restrict the sale of land. If a planter wants to sell a *jamma* land to members within his *manepeda*, or obtain a loan from formal sources, he/she is required to seek the permission of the senior most living member (*pattedar*) of the family. This requirement has dampened market forces, which otherwise may have triggered agricultural land sales.

The *jamma* system helps keep a village community more or less homogenous and culturally intact. Since there is a restriction on land sales, prospective land buyers from the outside, who may not share the cultural and social values of the villagers, are less likely to acquire agricultural land in Kodagu. This restriction has thus indirectly fostered the preservation of village institutions and attendant sacred groves in the district (Nagaraj, 1993).

In more modern times, especially after India’s Independence in 1947, government land tenure laws in each state impose restrictions on the holding size. However, the Land Reforms Act of Karnataka of 1961 and the Land Reforms Rules of 1973 exempt plantation crop lands from ceiling restrictions on land holdings in order to retain existing economies of scale and to allow for specialization of plantation crops. Unlike other agricultural areas in the state, there is no maximum ceiling on plantation land holdings in the district. There appears to be another reason for this exemption. Kodagu coffee contributes to around 70% of total exports from the state of Karnataka. The government did not want to institute a land-ceiling policy that might affect the district’s economic advantage in coffee production, and in turn, the total coffee export. This exemption has enabled Kodagu farming families to maintain large plantations and appropriate sizeable profits.

4. Social and economic drivers of institutional changes

Understanding the factors that have brought about changes in the institutions and operations of sacred groves is critical to making relevant policy changes. We find in our analysis that both societal (altruistic motives, religious values, etc.) and market factors (price, time preference, speculation, etc.) have played and continue to play key roles in shaping the institutions. On one hand, certain rural households prefer to cling on to the age-old beliefs and symbols that had kept the sacred groves intact for several hundred years. On the other hand, some stakeholders, under the influence of broader cultural, economic and political forces, would like to put sacred groves under alternative uses. Thus, Kodagu sacred groves present an interesting case of collision between an age-old social system and modern socio-economic forces. In this section, we present some of our findings on villagers’ current attitude toward sacred groves, examples of internal

and external forces that drive levels of resource use, and how people are coping with some of these forces.

4.1. Coffee production and timber harvest

In spite of a strong traditional belief in the sacred grove system prevailing among people, market forces have taken their toll on the sacred natural forests. As mentioned earlier, export earnings from coffee forms around 70% of the value of total exports from Karnataka. Kodagu’s contribution to this share is substantial. Since India exports more than 50% of its coffee production, the international coffee price has a tremendous impact on the coffee production and supply in Kodagu. Obviously, increases in the market price in the past several years have indirectly promoted the expansion of areas given to coffee cultivation. There have been several instances of encroachment of sacred groves for the sole purpose of growing coffee. Even though this type of encroachment does not result in deforestation, as shade coffee is grown, it could undermine the protected status of sacred groves, as temple committees would eventually lose control over encroached parcels of land. Since the plantation land available for sale is constrained because of the natural limits as well as the tenure restrictions imposed by the *jamma* system, encroachment into government or public lands is the only choice left for the profit-seeking planters. Ironically, as Bhagwat (2000) notes, even when the coffee prices are on the decline, the planters adjacent to sacred groves find encroachment attractive in order to sustain their cash flow. The following are some notable instances of encroachment that we gathered during our visit.

The famous Karingali sacred grove in Kutta Village is full of trees, as, even today, some farmers plant traditional trees, such as *ficus benghalensis*, in the grove as a vow. The sacred grove has been fenced by the Forest Department, but in spite of this, it has been encroached for the cultivation of coffee, ginger and banana. In Muttur Village, 24.29 ha of sacred grove, housing the deity *Ayira Billappa*, has been fully encroached for coffee plantation. Garvale Village has 30.36 ha of sacred groves devoted to the goddess *Bhagawathi*. Out of the total area, the village sacred grove committee has fenced off 20 ha for planting cardamom, utilizing the revenue for the maintenance of the temple. The village community imposes fines on encroachers. If the penalty is not paid, the community resorts to social boycott. Another village community, at Hyesodlur, has attempted to guard the temple as well as the temple tank.

Illegal timber harvests in sacred groves by out-of-district contractors and planters used to be common until a decade ago. However, the Forest Conservation Act (1980) of India paved the way for several state governments to enforce different regulatory measures pertaining to green felling.⁵

⁵ Green felling refers to cutting live trees as opposed to cutting or collecting only dead or fallen trees.

The state of Karnataka has implemented this act in letter and spirit by putting a ban on green felling, especially since the mid-1980s. Following this ban, the state government has also allowed timber imports from abroad. Now the imported timber constitutes more than 80% of the value of timber sales in major timber markets of the state.⁶ This has reduced the incentive for illegal timber harvesting in Kodagu natural forests. However, local people might occasionally extract timber or non-timber products from sacred groves. Under current laws, temple committees keep 90% of the timber sales proceeds when timber contractors harvest legally.

4.2. Ambiguity in property rights and encroachment

The legal or *de jure* status of many sacred groves is ambiguous. The 'Record of Rights' issued by the State Revenue Department sometimes erroneously lists them in the name of individual planters, even though they should be listed as state-owned properties (Kushalappa, 2000). This makes it more difficult for the village committees to enforce their informal sacred grove regulations. This lack of well-defined rights has led to widespread encroachment. A local committee of encroachers has stayed politically active and has been successful in getting rights to encroached parcels awarded to private parties. In some other instances where sacred groves are considered Reserve Forests, the government itself has allowed construction of homes for the homeless on the property.

4.3. Religious, cultural and demographic transition

The close-knit communities of Kodagu, where members share common belief systems, have acted as guardians of sacred groves. With the economic boom in plantation agriculture, the wealthy farmers have actively adopted consumerism, and modern popular culture pervades the rest of the state and the country. This change of lifestyle has had a dampening effect on tribal culture and religious beliefs. The rituals of Hinduism, the major religion of India, have shifted from predominantly nature-based to more indoor, temple-based forms. This shift might have partially reduced the degree of communion of common people with nature (Chandran and Gadgil, 1998). Further, the younger generations are alleged to have been losing interest in the *devarakadu* and *iyenmane* systems (Bhagwat, 2000). As a result, they themselves could become future encroachers of sacred groves. Also, such people are not likely to fight for the sacred grove institution in the future, as they might be at odds with the age-old culture.

Over the years, a large number of agricultural laborers and timber harvesters have immigrated from the neighbouring states and districts to find gainful employment in

Kodagu. These newcomers may not share beliefs of the native tribes. The immigrant populations have created new demands for land for cultivation, settlement and other amenities. Forestlands, along with some sacred groves, have been the target of new settlements.

4.4. Attitudes and values in support of sacred groves

In the survey of coffee planters that the authors conducted in 2001, most planters indicated that the *devarakadu* of their village should remain a sacred grove and should not be converted to coffee plantation or other agricultural purposes. This shows that planters do place the preservation value, inherent in protecting the sacred groves, much higher than the commercial value that comes from converting them into cropland or plantation. Moreover, 47% of the respondents felt the present size of their sacred grove could be expanded by an average of 8 acres. About 42% of the planters opined that the present size of their sacred grove was adequate. These numbers do indicate that a large majority of villagers are interested in either expanding or preserving the size of their sacred groves.

The survey also revealed that planters derive non-use values⁷ from sacred groves. About 26% of the respondents were willing to contribute an average 0.49 ha of their own land per family toward sacred grove expansion without expecting any monetary return. At an estimated market value of Rs. 105,885⁸ (US\$2,302) per acre of sacred grove, this contribution amounts to Rs. 127,062 per family (US\$ 2,762). About 32% of the planters are willing to contribute a sum of Rs. 2,667 (US\$58) in cash as a one-time contribution for the *devarakadu*.

5. Decline in sacred groves and socio-ecological impacts

There is growing evidence that the changes in the governance and use of *devarakadus* have negatively impacted the environmental and socio-economic sustainability of these groves. These impacts can be characterized in terms of size, sustainability, increased costs of management, loss of cultural diversity, political impacts and fairness in the distribution of income and wealth.

The major environmental impacts emanate directly from the loss, or reduction of sacred groves in the area. About 59% of the area under the original sacred groves has been lost during the 1900s. As one or more private planters convert a portion of a sacred grove to coffee, cardamom or ginger cultivation, both current and future generations of a

⁶ Personal communication with S.S. Chauhan, Scientist, Institute for Wood Science and Technology, Bangalore, India.

⁷ Non-use values are said to exist when people voluntarily pay for the preservation of certain natural resources that they never even see or use. People could derive non-use values from a natural resource just by the notion it exists under certain conditions (Field and Field, 2002, p. 157).

⁸ The exchange rate used here is US\$ 1 = Rupees 46.

given village will lose ecological as well as cultural benefits. As noted earlier, even though sacred groves represent an insignificant portion of Kodagu's total area, they are rich in biodiversity. A large number of individual sacred groves might have been reduced to a size below their minimum biologically viable size. Also, as observed in other parts of India (Ramanujam and Kadamban, 2001), encroachment processes could fragment large sacred groves into smaller parcels. This could seriously jeopardize their long-term sustainability. The fragmentation process also makes a community vulnerable to losing control over the portions of the original groves that are distant from the village.

Illegal encroachment and the government's laxity in enforcing property rights have financial implications for villagers. Environmentalists and villagers are increasingly turning to courts to settle property right issues. Such litigation has cost temple committees both time and money. For instance, in Karada Village, the temple committee has been fighting since 1985 in a local court to repossession an acre of their sacred grove and has spent Rs. 15,000 in legal fees. The committee has also spent money on publicity through local news media. As village communities and the state government begin restoration activities throughout the district, there are additional monetary costs in terms of land survey, legal costs of eviction, and restoration of groves to their original form.

The sacred groves are the backbone of the Kodagu culture. Thus, the loss of this resource system may eventually precipitate a decline in the district's cultural diversity. The *jamma* land tenure system has helped keep the original tribal mix fairly intact. However, other social and market developments have made village communities lose faith in their traditional system. The encroachment of sacred groves by a few planters who own land adjacent to them also results in inequity. Only encroachers continue to benefit from any gainful economic activities in the groves. These individuals will obviously attempt to keep the rest of the villagers away from the encroached property.

6. Policy implications

Based on the case study presented in the preceding, we are now able to recognize the factors that are having the greatest impact on the future of sacred groves, not just in Kodagu but in all of India. They include:

- Ambiguous property rights to sacred groves;
- Market forces that continue to lure villagers to seek opportunities to expand land under agricultural production;
- Weak economic and political power of traditional authorities;
- Inability of government to enforce property rights;
- The transformation of demography and popular culture; and
- The changing system of beliefs.

Resolving every one of these factors is beyond the scope of this paper. For instance, the last two factors are embedded in a broader social change that has permeated the entire Indian society. Nor is it necessary to stem the occurrence of each of them. The various policies recommended later in this section must focus on the following objectives:

- First, there must be no further loss of sacred groves or reduction in the area occupied by them. This objective seems simple yet warrants a major change in the current institutional arrangements as well as in the mindset of the state government.
- The second policy objective would be to recover those sacred groves currently encroached to the extent possible. Obviously, this is the most difficult goal to achieve.
- The third objective is to enhance the efficiency and equity of resource use in sacred groves. We will return to this objective later.

At the heart of the problem is the mixed — state-cum-common — property regime that fails to recognize clear rights and duties of its constituent parties. Even though the state holds the ownership, it has been ineffective in enforcing the boundaries due to various political, bureaucratic and financial circumstances. As long as this weakness remains, private planters and loggers will have an incentive to encroach upon sacred groves. Conversely, the ownership vests in the state, and traditional authorities in villages are unable to enforce the property boundary against encroachers.

It is evident that the current institutional arrangement needs reform. First, sacred groves should no longer be classified as state reserve forests. The secular principles underlying the state forest laws that recognize reserve forests prevent the government from barring non-religious use. Federal and state laws must be changed to endow sacred groves with the status of true sacredness. Second, village committees may be given broader powers to enforce rights and restrictions and to manage the actual use of the resource.⁹ With the decentralization of power, the cost of enforcement will be passed on to villagers — the actual beneficiaries of sacred groves.

Village institutions can be further strengthened if their internal structure of governance is clearly defined. Currently, most local management units are customary in nature and rely on the voluntary compliance of duties and rules by its members. Various incentives and disincentives may be incorporated into their laws so that overuse or abuse can be prevented effectively and immediately. A new state law may be enacted in order to legalize the village-level sacred grove management committees, along the lines of the

⁹ However, mere government recognition of the sacred groves is not adequate for the long-term preservation of this local institution. As an anonymous referee suggested, the faith and interest of the people of the younger generation in the sacred as well as ecological significance of the groves are equally essential.

Karnataka Cooperative Societies Act,¹⁰ and an appropriate district-level union. Village management committees must be empowered to function autonomously with very little government intervention. This arrangement might allow local groups to make rules and regulations that closely reflect the historical or religious uniqueness of each *devarakadu*.

The newly constituted district union in Kodagu, *Devakad Thakkamme*, could draw upon the collective wisdom, legal power and financial strengths of all village committees in the district. The union might serve in advisory, educational and promotional roles for the betterment of sacred groves. In villages where sacred groves are too small or enjoy insufficient local support or interest, the district union might take over the management responsibilities for such groves. The most important contribution of this union is to arbitrate between the members of individual sacred groves, should illegal encroachment and use arise. This model of district-village hierarchical self-governance dovetails with the ongoing process of decentralization of forest management in India (Potter, 1999) and other Asian countries, such as Indonesia. Village forest committees are being formed around the country under the joint forest management programme. This programme may recognize sacred groves as official legal institutions and encourage interaction between JFM projects and village forest committees.

The next task is to recover those sacred groves already lost. This process would demand an effective coordination between the State Forest and Revenue departments and respective village committees. A strong political will would be necessary on the part of the state government. To begin with, all the parties involved must know the original boundaries of the sacred groves. With the help of the Revenue Department, the property in question would have to be surveyed. Then, one or more approaches, including private negotiation, social sanctions, legal threats and financial incentives, may be needed in order to re-acquire the encroached lands. In recovering lost groves, a psychological transition period would be required. People need time to adjust to the notion that forest parcels, that have been under certain uses for some time, are now being reclassified as sacred groves.

The financial incentive mentioned above merits further elaboration. In some cases, the encroachment for home building may have taken place several years back. The private encroachers might have invested a considerable amount of capital. Also, people who have built houses on such lands would have invested in various home amenities. A partial compensation for their sunken investment may be required, which would have to be adjudicated on a strictly

case-by-case basis. Such compensation mechanisms should be used only in cases where benefits of land acquisition are considerable. Otherwise, other approaches outlined above may be preferable.

As suggested above, if local groups are made responsible for the total management and enforcement of sacred groves, they need to have the financial strength to carry out their duties. The cost of new management may exceed the revenue currently being generated through traditional sources, such as informal annual membership contributions and special donations collected during festivals. In order to defray the costs of management, a small portion of the sacred groves may be used for producing commodities (timber, coffee, ginger, etc.). This activity should be allowed only where the size of a sacred grove exceeds an environmentally viable minimum. Also, the production should adhere to the principles of sustainability.

The above policy recommendations apply to sacred groves in other parts of the world as well. Their gradual elimination is not just common to India and in modern eras. For instance, Hughes (1984) reports that, during the fifth century AD, sacred groves succumbed to anti-pagan sentiment that prevailed in the Mediterranean region, and many were cut down by royal decree. In the modern era, economic pressures have overshadowed their importance in Africa, Australia and Asia (Ramakrishnan *et al.*, 1998; Jeffery, 1998). Given the proper legal foundation and appropriate economic incentives, sacred groves could serve as an effective model for decentralized, community-based resource management. What we need is a healthy compromise between modern secular principles and traditional sacred values.

Acknowledgement

This paper was written while the first author was visiting the Department of Environmental Studies at the Florida International University (FIU), Miami, USA, during the summer of 2001 as a visiting professor. The visit was supported by the Environmental Economics Overseas Fellowships Committee, National Institute of Public Finance and Policy, New Delhi, India. Authors thank M.G. Nagaraja, C.G. Kushalappa, and P.G. Chengappa for their help. Also, thanks to Nivedita Bhat for editing the paper.

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¹⁰ The Karnataka Cooperative Societies Act allows any seven persons with common societal goals to voluntarily form an autonomous, self-reliant cooperative society for self help and mutual help. The society must follow the democratic principle of one-person-one-vote, and members have limited liability. The financial operations of the cooperative are subject to the annual audit of the Registrar of Cooperatives.

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