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Review/Synthesis

Sandal (*Santalum album* L.) conservation in southern India: A review of policies and their impacts

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Abstract

Legal barriers for growing sandal, have so far prevented private initiatives for domestication/conservation of this prized tree of Indian forests, accelerated its illegal harvesting from natural forests, and admittedly failed to conserve this resource. We attempted to critically examine the sandal conservation efforts in India especially from a policy perspective, through a detailed review of the various Acts framed for conserving this resource and regulating its extraction and trade. Legal constraints that hamper private initiatives in *ex situ* sandal conservation/domestication and inconsistency in legal provisions related to sandal extraction and trade among the major producer states of southern India viz. Karnataka, Tamil Nadu, and Kerala are the principal focus of this paper. The need for liberalization of the existing policy regime and evolution of a comprehensive management strategy for sandal, focusing on tree domestication and strengthening of *in situ* conservation measures backed by imaginative participatory management strategies, are highlighted.

Keywords: Participatory management, Sandal extraction, Trade liberalization, Tree domestication.

Introduction

Santalum album L. (East Indian sandalwood or sandal), a small evergreen hemi-parasitic tree renowned for its fragrant heartwood, has been synonymous with ancient Indian culture and heritage (Srinivasan et al., 1992). The species is indigenous to India and its distribution is limited to an area of about 9600 km^2, mostly in the deciduous forests of the Deccan region of peninsular India (Gairola et al., 2008). The southern Indian states of Karnataka and Tamil Nadu together account for more than 90% of the natural population of *S. album* in India. India has traditionally enjoyed a niche market for the premium prized East Indian sandal wood oil, which has excellent medicinal properties and is widely used as a fixative in the manufacture of world class perfumes and aromatic oils due to its intrinsic blending properties (Baruah, 1999). Sandalwood also finds extensive applications in carving and turnery and possesses religious significance (Parthasarathi and Rai, 1989).

Sandal is recognized worldwide as one of the most valuable commercial tree species with an estimated market volume of more than $1 billion (Viswanath et al., 2008). Despite the value of the resource and its status as India's brand ambassador in international markets, recent data on production of sandalwood in India show a declining trend (Fig. 1). India's sandalwood production dropped from 4000 Mg heartwood per year in the 1950s to a mere 500 Mg in 2007 as against the global annual demand of about 5000 to 6000 Mg wood and around 100 to 120 Mg oil (Gairola et al., 2008).

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The widening gap between production and demand and the unlicensed export of finished sandal products under the EXIM policy (Barauh,1999) have led to a sharp rise in sandal wood prices since 1992 in Karnataka and Tamil Nadu (Fig. 1). Between 1996 and 2006, when the average annual sandal production (excluding seizures) in Karnataka diminished by 65%, the average auction prices of sandal heartwood shot up by more than 590% to Rupees 1.656 million per Mg (Fig. 1). Despite its traditional advantage of being a front-runner in sandal trade, India has now lost the potential economic opportunity in sandalwood and sandal oil trade to Australia and Indonesia. Indonesia produced 1000 Mg sandalwood annually in the 1980s (McKinnell, 1990) and Australia had 830 ha of Indian sandalwood plantation in 2001, which is projected to expand to 2300 ha by 2011 (Awasthi, 2007).

Studies also indicate a substantial loss of genetic diversity of natural sandal populations in the major sandal bearing

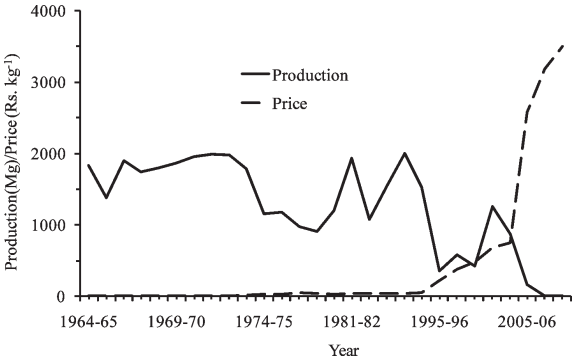

Figure 1. Average sandalwood production and price trends in the southern Indian states of Karnataka and Tamil Nadu (Reporting period: 1964–'65 to 1975–'76, 1978–'79 to 1985–'86, 1995–'96 to1997–'98, 1999–'00 to 2000–'01, and 2005–'06 to 2008–'09). Sources: Parthasarathi and Rai (1989), Rai (1990), Rai and Sarma (1990), Divisional Forest Office Records, Salem, Tamil Nadu (pers. commn.,16 September 2007); Office of Additional Principal Chief Conservator of Forests, Forest Resources Management Division, Karnataka Forest Department, Bangalore (pers. commn., 20 August 2008); Government of Karnataka (1995–1996 to 2008–2009). Wherever data were not available from a particular state, corresponding values from the other state has been considered representative. All prices are in nominal terms.

regions of India in recent decades (Venkatesan et al., 1995). Owing to its rapidly declining status, *S. album* has been accorded the *vulnerable* status by the International Union for Conservation of Nature and Natural Resources (IUCN) in 1998 (Awasthi, 2007). In addition to the erosion of sandal gene pool and loss of adaptive gene complexes that might have evolved through the process of natural selection (Meera et al., 2000), depletion of sandal resources has also become a major concern for the *Gudigars* (sandalwood carvers of Uttar Kannada district, Karnataka) whose livelihoods are dependent on this resource (Chandrasekhariah and Dabgar, 1998).

Recurrent annual fires, lopping of trees for fodder/grazing, sandal spike disease (Rai, 1990), invasive weeds like *Lantana camara,* and spread of monoculture plantations of eucalyptus (Basappanavar, 1977) have altered the ecology of natural sandal ecosystems. While these factors hinder regeneration in forest areas and diminish the growing stock, overexploitation and illicit felling further aggravate the situation (Swaminathan et al., 1998), and indications are that such woes are likely to increase. For example, in Karnataka, between 1980 and 1997, sandalwood recovered from poachers accounted for just about 30% of the gross sandal yield (Meera et al., 2000), while in 2006-'07 the quantity of recovered wood was about 78% more than the gross yield (Government of Karnataka, 2007). Till recently, overall response of the state governments to the threat of smuggling has been limited to imposing stringent controls over sandal extraction and trade through monopolistic laws and regulations (Viswanath et al., 2009). However, this has not deterred illegal and indiscriminate harvesting of sandalwood nor has it helped to conserve the species in its natural habitat and its sustainable utilization (Mahapatra, 2001). Paradoxically, the restrictive policy labyrinth has resulted in the perverse outcome of discouraging legitimate interest in sandal growing (Rao, 2002). In this article, we attempt to review the impact of protectionist policy measures on the status of sandal resources in India and seek to provide recommendations for devolved and participatory management of this resource.

Sandal wood policies in the context of property rights in natural resource management sector

In India, assertion of state monopoly and exclusion of forest communities have been the guiding principles of forest administration since its inception in 1864. Prevailing paradigm among the forest bureaucracy for the past 14 decades has been that conservation is the sole prerogative of the state (Hazra, 2002). State-property rights regime is justified as being in national interest (Guha, 1983) and often evokes the "tragedy of commons" argument (Hazra, 2002). But Cooper (2005) observes that state's insistence on tight control on access to forests and forest products has been mostly aimed at the revenue from forest sector. In the case of sandal, the astronomical prices of its wood and oil are strong incentives for the state to maintain a tight control over the available resources. However, achieving complete government control over resource access and use has proved difficult as state control has been rather lax, ineffective, and often corrupt in regulating resource access (Ostrom and Nagendra, 2006). At the same time, lack of ownership resulted in reduced incentives for people to preserve the forests and thus for large parts of India, nationalization had the unintended effect of creating "open-access" resources (Nagendra, 2007). Inability of the state to enforce the laws and corruption have been highlighted as major contributing factors for depletion of natural sandal resources (Rao, 2002).

Sandal in private lands has been an instance of combined rights with the state claiming value of a natural resource situated in private properties. The consequence of such intertwined ownership regime has been extensively discussed in the context of the Eastern Indonesian island of Timor. For instance, in Nusa Tengarra Timur (NTT) province, the government claimed ownership of all sandal trees in private lands in 1986, setting annual harvest quotas, and periodically inventorying the stock of trees, as well as declared itself as the sole buyer of sandalwood and prohibited export of unprocessed logs (Marks, 2002). These policies resulted in a sharp decline in the standing stock of sandal owing to high rates of illegal cutting and removal of young trees by locals to avoid any obligation to maintain the trees once they have been inventoried (Rohadi et al., 2000). Relaxation of harvest quotas in 1996 and 1997 led to further depletion of stock trees to the point that a five-year ban on felling had to be imposed. Marks (2002) opines that temporary policies that created perverse incentives to harvest sandalwood along with insufficient replanting owing to governmental expropriation of private property rights on the trees have been largely responsible for depletion of sandal in NTT.

Legal provisions governing sandal conservation in India - a retrospect

History is replete with instances of Indian rulers trying to monopolize sandal resources to ensure financial strength for dominance and warfare, the classic case being the mighty Vijaya Nagara Empire (13^{th}–16^{th} century CE) of Deccan region (Ganeshaiah et al., 2007). More recently, Tippu Sultan, the ruler of Mysore, in 1792, declared sandal as a royal tree and even went to the extent of amputing the hands of sandalwood thieves to enforce the royal decree (Rai, 1990). Even after independence when state forest laws were framed, provisions were made to enable the states to continue the control regime.

Karnataka, being the hub of sandal production in India and a major beneficiary of sandal revenues, has a special chapter (Chapter X) relating to sandalwood in the Karnataka Forest Act (KFA), 1963. Section 84 of KFA proclaimed that all sandal trees growing in any land including private lands to be the exclusive property of the state government (Government of Karnataka, 1963). Landowners had no right on the tree, but were responsible for its preservation. Only the government had the right to sell or trade the wood. On extraction of the tree, the landowner was paid a bonus (75% of net value i.e., actual value less cost of extraction, transport, and cleaning), that too often after enduring long delays and many bureaucratic hassles (Jeeva et al., 1998). Punitive clauses in the law made the landowners vulnerable to severe punishments even for minor offences related to the sandal trees grown on their land. The whole system acted as a huge disincentive for private growing of sandal. In particular, the liability to preserve the trees and the fear of harassment and compensation to be paid

to the government in case of theft, had prompted the farmers to destroy even the saplings that came up naturally.

In the adjacent Tamil Nadu also sandal was declared a 'royalty' even on private property, in the Madras Forest Act of 1882, making unlicensed possession and extraction of sandalwood a punishable offence. In the neighbouring state of Kerala, The Kerala Restriction on Cutting and Destruction of Valuable Trees Act, 1974 and Kerala Preservation of Trees Act, 1986 and its subsequent amendments, imposed restrictions on the extraction of selected tree species on private lands including sandalwood. But there were no restrictions on transport, possession, trade, and processing of sandalwood (Ramakrishnan, 1995; Kushalapa, 1999). Cases related to illegal transport of sandalwood were booked only under transit rules common to all timbers. The relatively liberal laws in Kerala coupled with stringent controls in the neighbouring states made Kerala a haven for illicit sandal rackets. Around 25 distilleries had sprung up in the interstate borders of Kerala with Tamil Nadu and Karnataka, mostly sourcing illicit wood from the neighbouring states (Deepa, 2005).

A major beneficiary of the perverse policy situation was the forest brigand, Veerappan who operated a vast sandalwood smuggling network in southern India, with impunity. Since government mechanisms to share the benefits of sandal proceeds with local people were non-existent, Veerappan enjoyed immense patronage from locals and in return gave them the needed cover to sell the valuable wood (Agarwal, 2000). Thus the monopolistic laws not only denied private incentives for growing sandal trees, but also aggravated illegal harvesting and trade, created outlaws, and led to a failure *in situ* conservation of sandal resources, with immense ecological and socioeconomic costs.

Recent initiatives for sandal domestication

Realizing the flaws in sandal policy which endangered the species, Government of Karnataka came up with amendment to Karnataka Forest Act in 2001 to encourage private domestication of sandal as means to conserve and enhance the status of this resource (Government of Karnataka, 2001). The amendment gave landowners legal right to trees on their land and made them eligible to receive full value on extraction. Shortly, Tamil Nadu followed suit with the Tamil Nadu Forest (Amendment) Act of 1998 in 2002, which gave landowners the right to trees (Government of Tamil Nadu, 2002). Kerala is still striving for a change, through measures like closure of all sandal oil distilleries on the interstate borders and inserting punitive clauses for illegal harvest and transport of sandalwood in the Kerala Promotion of Tree Growth in Non-forest Areas (Amendment) Act, 2006 (Government of Kerala, 2006).

Considering the large-scale demand for quality planting material for domestication, germplasm banks, clonal seed orchards and sandal nurseries are also gradually attracting government and private investments. For example, the Institute of Wood Science and Technology, Bangalore currently raises around 65,000 sandal saplings annually for distribution among private growers (Viswanath et al., 2009).

Loopholes in the current legal provisions on sandal

Though the amendments in Karnataka and Tamil Nadu were enacted with much hype over the liberalisation they were expected to usher in, the changes have rather been cosmetic (Table 1). The concept of private ownership is limited as the governments still retain control over felling, sale, and transport of privately owned trees (Cooper, 2005). Moreover, the situation remains a classic example of monopsony, a market perturbation in which there is only a single buyer and number of sellers and the monopsonist (i.e., the Forest Department, FD) can dictate the prices of the produce. As can be seen from Table 2, the fixed price offered by the FD in no way reflects the market price as indicated by the high prices offered in the illegal, but more accessible 'grey markets'. Such measures not only create perverse incentives for over-exploitation but also inflict a net loss to the society in terms of *lost producer surplus* (profit loss to legal sandal producers due to the lower rates offered by the FD, bureaucratic hassles,

Table 1. Changes in provisions related to sandal in the Karnataka Forest (Amendment) Act, 2001 and loopholes in the existing provisions.

Before amendment to KFA[1]	After amendment[2]	Loopholes/drawbacks
All sandal trees which may grow in any land shall be the exclusive property of state government.	Every occupant or holder of land shall be legally entitled to the sandal tree in his land.	Sandalwood in private land is still governed by rules applicable to forest produces.
Landowner shall preserve sandal trees growing in his land, and shall report any theft to the nearest Forest Officer or Police Officer, failure of which makes him liable to pay compensation.	Landowner is still responsible for the tree, but there is no provision for compensation.	The onus of preservation and reporting may lead to unnecessary harassment.
Imprisonment for a term which may extend to 7 years and fine which may extend to Rs. 25,000 for sandal offences.	Imprisonment for a term which may extend to 10 years and fine which may extend to Rs 100,000.	Punishment is same for all sandal offences ranging from removing a branch of the tree to illegally selling wood or distilling oil. Punishment is applicable to landowners too.
Land owner shall file a declaration about all sandal trees above 10 cm girth at breast height. Otherwise no bonus will be given on extraction of trees.	This provision removed.	Extensive bureaucratic procedures are involved in making payments towards the value of privately owned sandal trees.
No person can insist removal of the tree unless on grounds of obstruction to cultivation.	If the sandal tree intended to be extracted is matured, permission will be granted within about 4 months of application to Range Forest Officer.	'Matured' is defined as dead and decayed trees and trees with heart-wood at depth not less than 2.5 cm from surface. Extraction may not be done as and when the farmer wants and requires procedures which can take up to 4 months.
On extraction, the owner shall be paid 75% of the net value (gross value less cost of extraction, transport, cleaning and supervision and incidentals) of wood at rates sanctioned by government from time to time. No timeframe is specified for payment.	After deducting the cost of transportation, preparation, supervision and other incidental charges, the value of sandalwood fixed by FD shall be paid to the owner within 3 months from the date of receipt of the material in the depot.	Owner is entitled to value of the tree as determined by FD. Prices fixed by FD are well below the market rates. The time schedule for payment is often not adhered to without provision for interest on delayed payments.
No person shall possess/store/sell sandalwood except under a license. No provision specifying where to dispose the wood.	No change in the license clause. Wood can be disposed to government depot or to any government undertaking notified by the state government.	A clear case of government monopsony.

Source: [1]Government of Karnataka (1969); [2]Government of Karnataka (2001). KFA= Karnataka Forest Act; FD= Forest Department.

and the time lag in payments). In the long run, farmers may even be lured away by higher prices and immediate returns in the grey markets.

Lack of uniformity in legal provisions related to sandal among the different producer states still remains a big challenge to be addressed (Table 3). Inconsistency in law apparently encourages interstate smuggling and trade, as the offender in one state may not be guilty as per the rules of another state where part of the operations takes place. Though the Government of India formed a Sandalwood Advisory Committee to promulgate a uniform policy on sandal, the task has not been successful so far, due to conflict of interest among the sandal

Table 2. Monopsony pricing of sandal in Karnataka.

Year	Price fixed by KFD for private growers[1] (million Rs·Mg^{-1})	Retail selling price of KFD[2] (million Rs·Mg^{-1})	Average auction price of heartwood in Mysore sandal depot of KFD[3] (million Rs·Mg^{-1})	Price in grey markets in North India[4] (million Rs·Mg^{-1})
2004	0.14	0.880	1.553	14
2005	0.88	1.785	2.226	24
2006	0.88	1.750	2.374	44
2007	0.88	1.785	3.190	NA
2008	0.88[5]	2.710	3.268	NA
2009	0.96–2.02	3.393[6]	3.557	NA

Source: [1, 6]Office of Additional Principal Chief Conservator of Forests, Forest Resources Management Division, Karnataka Forest Department, Bangalore (pers. commn., 27 May 2010); [2]Government of Karnataka (2004–2005 to 2008–2009), Bangalore. [3]Office of Deputy Conservator of Forests, Sandal Depot, Mysore, Karnataka (pers. commn., 3 October 2007); [4]The Times of India, Kanpur. Paradise lost: gone with the whiff (Available at www.times of india.indiatimes.com. Accessed 10 October 2007). [5]0.88 million Rs·Mg^{-1} till 15-7-'08, after that 0.96–2.02 million Rs·Mg^{-1} for different grades of heartwood. Grading of wood while purchasing from private landowners was initiated by Karnataka Forest Department with effect from 15-7-08 as per order No:A6.SDL.GL-5184/04-05/08-09 dated 16 July 2008 (pers. commn., 20 August 2008).

occurring and sandal non-occurring states of India (Kushalapa, 1999).

Policy recommendations for encouraging sandal domestication

Table 4 clearly justifies the need for revamping the existing policies to create a conducive environment for private domestication and trade of sandalwood. As Marks (2002) rightly argued in the Timorese context, "if a family nominally owns the trees on its land but has to get permission to exploit them, and then receives only a small fraction of their economic value, the ownership right does not mean much". Freedom to fell the tree at any time and to sell it to any buyer (not to a state monopsony) at the best price that the owner can negotiate is an integral part of total ownership right. Proper monitoring and security mechanisms should be in place to check smuggling of sandal from the natural forests. But the cost of doing so should not be shifted to legitimate growers in terms of restrictions on selling and monopsony pricing. Prices determined by the government should be applicable to forest-grown sandalwood only and the private growers should be compensated by offering the actual market value.

Relaxation of rules favouring private domestication, however, should be complemented by stringent punishments for sandal offences in natural forests. Sandal offences may be made non-bailable and cognizable in all states and punishment should be graded, based on the severity of the offence. In a liberalised regime, conflicts and controversies over ownership of the resource as well as on protection and reporting may not arise reducing the administrative burden on these. A sandal task force can also be set up to liaise between the forest department and private growers. Captive plantations by sandal based industries are also to be promoted to reduce pressure on natural sandal resources. As production would be augmented through private growing over the coming years, prices are expected to come down, making smuggling less lucrative and further promoting natural growth and regeneration of sandal. Thus de-control of sandal trade has to be accomplished in phases so as to keep pace with the volume of wood produced *ex-situ* to avoid speculation and indiscriminate extraction. Ensuring synchronisation and uniformity of these steps at least in the major sandal growing states should also be a priority in the sandal bioresource governance arena.

Participatory management of sandal resources

Owing to the long gestation period, and high protection costs, sandal cultivation may prove affordable only to the resourceful sections of the society possessing

Table 3. Comparison of existing sandal provisions in Karnataka, Tamil Nadu, and Kerala.

Provision	Karnataka[1]	Tamil Nadu[2]	Kerala[3]
Status of sandal	Forest produce	Royalty	Forest produce
Ownership of tree in private lands	Landowner	Landowner	Not specified
Right to fell the tree	Only matured trees, with permission from FD.	The landowner after obtaining the written permission can fell sandal trees.	Cutting or removal may be done only by the FD.
Selling of tree and trade in wood	Only to FD or government undertakings as specified.	Only to FD.	Only to FD.
Bonus paid to farmers	Net value of the tree i.e. gross value based on average auction prices less cost of cleaning and supervision.	47.5% of auction value till 2001, new rules are yet to be framed.	70% of auction value or auction value less cost of extraction, transportation, and working, whichever is less.
Timeframe for payment to farmers	Within 3 months	Not specified	Not specified
Power of government to remove trees from private land	No such provision.	Any authorized government agency can remove sandal tree from private lands after due notice.	Not specified
Possession of wood and oil without license	Up to 3 kg wood and 100 g oil.	Up to 5 kg wood, oil not specified.	Not specified.
Punishment for offences	Not graded.	Graded based on severity of offence.	Specified only for illegal removal and transport of trees.
Power of forest officers to compound offences	Not applicable to sandal offences.	Applicable to sandal offences involving sandal up to 100 kg.	No provision.
Presumption in case of sandalwood	In case of a controversy, sandalwood is presumed to be the property of the State Government; the burden of proving the contrary lies on the accused.	The burden of proof is on the accused.	The burden of proof is on FD.

Source: [1]Government of Karnataka (2001); [2]Government of Tamil Nadu (2002); [3]Government of Kerala (2006). FD= Forest Department.

sufficient land and financial capital to invest. Hence to ensure distributional equity of benefits from domesticating this valuable bioresource, government strategies should encourage smallholder farmers to integrate sandal into their agroforestry systems. Before sandal trees develop useful quantity of fragrant heartwood, they can also be harvested for other useful products. For example, leaves are excellent sources of green manure and fodder, dry branches are used as fuel, fruits are edible, and seeds yield oil that can be used in varnish industry (Venkatesan et al., 1995). In addition to yielding such annual benefits, sandal in mixed cropping systems serves as a long-term domestic investment within an economically diversified agricultural asset base. Extensive market deregulation in terms of prizing regimes and transparent marketing channels and reorientation of the role of forest resource managers from an exclusive 'policing' role to one of facilitating long-term agroforestry in partnership with local farming communities will go a long way in promoting smallholder sandal forestry (McWilliam, 2001).

Although private growing of sandal by itself can enhance the status of the resource, by no means this

Table 4. Why sandal laws should be liberalized?

Justification for state monopoly	Counter arguments	Reference
Relaxation of rules and higher prices for wood will lead to large scale exploitation of the resource and will put natural sandal populations at greater risk.	Sandal population may resurrect under a decontrolled regime, as cultivation is encouraged and additionally farmers would safeguard natural regeneration. Farmers from states with liberal laws related to sandal have taken up sandal cultivation in a big way.	Viswanath (2009)
	If liberalisation would lead to decimation of species, it would have happened to other valuable species like teak (*Tectona grandis* L.) and rosewood (*Dalbergia latifolia* Roxb.) that are not controlled like sandalwood.	Kushalapa (1999)
Early harvesting (15–20 years old trees) under cultivated conditions reduces natural regeneration and results in lower wood quality and quantity.	If property rights and a permanently remunerative price are assured, farmers may wait for trees to grow big and may put more land into sandalwood production. Also if people are rewarded for selling better grades of sandalwood rather than being paid a uniform price, their own incentives to leave the trees in the ground longer will be enhanced.	Marks (2002)
Oil content and quality of heartwood of cultivated trees may be inferior to trees from natural stands.	*S. album* plantations in Western Australia at 14 year show santalol (compound responsible for distinctive fragrance of sandal) levels meeting current ISO standards for *S. album* oil.	Brand et al. (2006)
	In India, under cultivated conditions, a mean annual increment of 3–5 cm per annum has been observed, compared to 1 cm per annum in forests. Quality issues, even if true, may be compensated by larger outturn of wood expected under cultivated conditions and a quality linked price regime in free markets.	Rai (1990) Viswanath et al. (2008)

can be a substitute for conservation of the enormous genetic diversity of sandal germplasm in natural areas. Effective institutional mechanisms are to be carefully crafted to enable the sharing of conservation benefits with the marginalized communities in forests and its fringes so as to ensure sustainable conservation of natural sandal resources. Introducing sandal in Joint Forest Management (JFM) programmes through the Forest Rights Committees and community managed waste land afforestation programmes offer a means for inclusive sandal resource conservation. The ability of sandal to grow well in mixed woodlots or near fields and its potential to provide the much needed sums for village/forest development projects are clear and may provide direct incentives for local communities to conserve the species, if included in JFM programmes (Cooper, 2005). A successful initiative in this context is the ecotourism programme launched in Marayur sandal reserve of Kerala with local community members engaged as guides, thus paving way for benefit sharing and participatory management of the reserve. This initiative of inclusive conservation could bring down the rate of illegal felling of sandal trees in the division from eight a day to 0.14 in 2009 (http: // www.hindu.com/2009/12/30/stories/2009123055930400.htm; accessed 5 January 2010).

Conclusions

The analysis of sandal related legal provisions reveals that the monopolistic policies for sandal conservation and utilisation in India have so far exacerbated the deterioration of sandal resources. Policy anomalies and distorted markets have in fact turned out to be more detrimental to the sustenance of this resource than natural precincts. Declining natural stock and dis-

incentivised domestication also led to the waning status of Indian sandal in the global markets. This points to the need for a phased liberalization of policy and market regimes. Efforts for saving this valuable resource from extinction should definitely entail a strengthening of traditional conservation measures backed by a multitude of strategies to provide stakeholder incentives for conservation, ranging from co-management and community based management to private management. This probably can ensure a fair distribution of potential economic benefits from free and sustainable sandal production in public (mostly natural forests) and private (mostly cultivated) lands.

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