



# The new foresters

The role of private enterprise  
in the Indian forestry sector

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# Contents

Executive summary	i
Preface	xv
Acknowledgements	xix
Acronyms	xx
1 Introduction	1
1.1 Challenges facing India's forestry sector	1
1.2 Overview of the Indian forestry sector	3
2 Policy for private sector participation	13
2.1 Government forests	14
2.2 Private forests and forestry on non-forest lands	17
2.3 Industrial processing	19
2.4 Summary of the policy environment	23
3 Role of the corporate private sector	25
3.1 Initiatives to secure raw material from farm lands: company-farmer partnerships	27
3.2 Commercial plantations on degraded forest lands	42
3.3 Plantation companies and public investment in forestry	46
4 Role of farmers: farm forestry	51
4.1 Farm forestry in the 1970s and 1980s	51
4.2 Farm forestry: current scenario	58
4.3 Discussion of findings from the two districts	68
4.4 Summary of findings on farm forestry	74
5 The role of communities: Joint Forest Management	77
5.1 Progress of JFM	77
5.2 Current commercial production from JFM	79
5.3 Potential of commercial production from JFM forests	84
5.4 Potential impacts of JFM commercial production	94
5.5 Generating commercial output from JFM areas: an analysis	95
5.6 Summary of potential production from JFM	97
6 Promoting sustainable management: a case study of the ayurvedic industry	99
6.1 Introduction	99
6.2 Overview of the ayurvedic industry	100
6.3 Trends in demand and supply	103

6.4	Institutions responsible for the medicinal plants trade	106
6.5	Potential application of criteria and indicators	107
6.6	Conclusion	109
7	The process of policy change	111
7.1	Introduction	111
7.2	Important players and processes	111
7.3	Policy change in practice: a case study of <i>Lok Vaniki</i> in Madhya Pradesh	116
7.4	Lessons from the <i>Lok Vaniki</i> experience	127
8	Conclusions and recommendations	129
8.1	Is private sector participation needed?	129
8.2	What is the current role of the private sector?	130
8.3	How can the private sector's role be enhanced?	131
8.4	What does the future hold for the private sector?	144
	References	145
	Annexes	151

# Executive summary

The Indian forestry sector has undergone much change in the last decade, following the national forest policy of 1988 and the economic liberalisation programme which started in 1991. These have fundamentally altered the direction of forestry in the country. The government forests are now managed primarily for ecological services and meeting local communities' subsistence needs, ending decades of commercial focus. Forest-based industries, accustomed to getting subsidised raw material supplies from government forests, are now expected to meet their requirements from non-forest lands by establishing a direct relationship with farmers. In addition, economic liberalisation has exposed the industry to international competition.

The role of the government, which controls most forest lands, has also undergone a significant change. It is now widely recognised that the government alone cannot ensure that forests are sustainably managed, that they provide the goods and services that are demanded of them, and most importantly, that the livelihoods of those dependent on forests are assured and sustainable. Consequently, local communities are being involved in the protection and management of government forests through the Joint Forest Management (JFM) programme, which started on a pilot scale in the early 1990s and has now spread to over 18% of forest lands.

This study examines this important phase in Indian forestry. It offers an approach to addressing some of the major challenges facing the Indian forestry sector, by examining the potential contribution from the private sector to sustainable forestry and forest-based livelihoods.

As one of the five country studies commissioned under IIED's international project *Instruments for Sustainable Private Sector Forestry*, the study presents the results of one year's research by the Indian research team. The research included ten sub-studies, which are listed in the preface of this report.

The India country study aims to:

- understand the current situation, trends and potentials with respect to private sector participation in sustainable forest management;
- review the impact of sectoral and extra-sectoral policies on private sector participation; and to
- explore strategic options for the private sector to contribute to sustainable forest management in India.

In the context of this study, the term 'private sector' is interpreted broadly such that it includes all those who engage in commercial activities concerning forest



goods and services – be they individuals, community groups, informal sector groups or the large-scale corporate sector. Given that the study focuses on commercial goods and services, issues concerning subsistence use of forests are addressed only where they have a direct bearing on sustainability, for example, in the JFM programme.

## Resource and key players

Forest land in India – according to the legal definition but which doesn't necessarily imply tree cover – covers approximately 23% of the country's area. Almost the entire forest area is owned and managed by the government. Private ownership – whether by corporate bodies, communities, or individuals – comprises just 3% of this land.

Forest productivity is far below the regional (tropical Asia) or global average. Additionally, there is intense pressure on forests from large human and livestock populations directly dependent on this resource. Nearly three quarters of India's population (now over 1 billion) resides in rural areas and has some degree of dependence on forests. Over half of the forests are in a degraded condition.

The government is by far the most dominant player in the forestry sector. It owns and manages most forests and closely regulates forestry activities on non-forest lands. Important players in the private sector include forest-based industries, farmers and local communities. More than 90% of wood-based products are manufactured in the private sector. Farmers are important producers of wood. More than 50% of wood supply is currently acquired from non-forest sources, mainly farm lands. As mentioned earlier, community groups have started playing an important role in the protection and management of government forests. Around 63,000 community groups are protecting over 18% of forest lands under the JFM programme.



## Investment in the Indian forestry sector

Investment in the forestry sector has been very low. While forest produce worth Rs 300 billion is extracted annually from government forests alone, the total investment from both government and private sources is under 15% of that, at Rs 41.7 billion.

The forestry sector does not appear to be high on the government's funding priority list, despite the recognition that forests are important for people's livelihoods and environmental security. The share of forestry in the Five-Year Plans has mostly been under 1% of the total outlay. Available figures indicate that the private sector is making 64% of the investment in the forestry sector. External funding agencies provide around 20% while the government's share is only about 16%.

## Demand and supply scenario

There is a huge gap between demand and *sustainable* supply of various forest products. Fuelwood is by far the most important product extracted from India's forests and accounts for over 80% of the demand for wood in the country. It is

estimated that at least 131 million metric tonnes of fuelwood are being obtained unsustainably. Industrial wood is also in short supply. The study of two areas – Yamuna Nagar in Haryana and Rajkot in Gujarat – revealed that the ‘informal’ sector is an important contributor to demand and supply. The gap between demand and sustainable supply is projected to increase further in the future unless immediate remedial steps are taken.

## Policy environment

Recent years have seen numerous policy changes that have influenced private sector participation in forestry. The issuance of a new forest policy and certain amendments to the Forest Conservation Act in 1988 effectively ended the direct role of the corporate private sector on government forest lands. While JFM has resulted in greater community involvement on government forests, significant steps, such as provision of legal backing, are needed before JFM becomes institutionalised.

Forestry is a concurrent subject in India, meaning that policy is set at both national and state levels. State policies pertaining to the few private forests in existence are quite 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.

The national forest policy encourages tree planting by the private sector on non-forest lands. While land ceiling restrictions limit the possibilities of large-scale industrial plantations, development of ‘direct relationships’ between corporate industry and farmers for the provision of raw material are encouraged. However, bottlenecks such as restrictions on harvest and transport, land ceilings, the absence of patent protection for private sector research, cheap imports and marketing problems have limited private sector participation in this area.

The forest-based industries have been affected by recent changes in trade and industrial policies. While import of wood, wood products and pulp has become easier and cheaper, lowering of import duties on finished products have increased competition for the domestic industry. However, the industry is still somewhat protected as the reduction of duties on finished products is not as dramatic as those on raw material. Licensing requirements have been dispensed with for most industries (including paper and pulp). However, a large number of items are still reserved for production in the small-scale sector only.

These new policies have forced private sector industries, including those based on wood, to restructure themselves in order to maintain profitability; many units have, however, failed to do so. The transition has been particularly difficult for the wood-based industry, which also had to adjust to withdrawal of a committed supply of raw material from government forests at subsidised prices. Among these, the paper and pulp industry must also contend with strict environmental regulations. Although favoured by liberalised raw material imports and high duties on finished goods, many of these industries are short of capital and use obsolete technology – and doubts about assured sources of supply hardly encourage new investment and expensive modernisation. These conditions threaten the sustainability of the wood-based industry.



## Current and emerging private sector actors and their roles

The study considers in detail the current and potential roles of existing and 'emerging' private sector actors, and their possible contributions to sustainable forestry. Specifically, the study looks at the roles of corporate private sector, farmers, and communities.

### Corporate private sector

The wood-based industry in India is in a peculiar position because while 90% of wood-based products are manufactured in the private sector, 97% of the forest area is owned and managed by the government. The role that the corporate private sector can play outside government forest areas is also severely restricted as it is unable to raise large-scale plantations on non-forest lands on account of statutory land ceilings.

However, in recent years a large number of wood-based industries have attempted to promote tree cultivation among farmers in order to secure their raw material supplies. Sporadic efforts by individual companies started in the mid-1980s but most initiatives began in the 1990s. The driving forces behind these initiatives were the declining supply of cheap raw material from government forests on account of policy changes, and increased competition due to economic liberalisation.

Several companies encourage tree planting by farmers by simply supplying free or subsidised seedlings. However, experience indicates that farmers do not take adequate care of such seedlings. Many companies have attempted direct partnerships with farmers. Basically two types of schemes exist:

- *Bank loan schemes:* The company helps the farmer to obtain a loan to plant trees for which it provides planting stock, technical extension and a buyback guarantee. In the majority of cases these schemes have been discontinued, owing to a combination of factors including cumbersome loan sanction and instalment release procedures, farmers' lack of clarity about terms and conditions, high company charges for seedlings and technical extension, diversion of loans by farmers for other uses, and early harvesting by farmers. Nevertheless, these schemes have been important in popularising tree farming in the areas where these schemes were introduced.
- *Leasing of farmers' land or crop sharing schemes:* The company raises and maintains plantations on farmers' land and pays a fixed lease rent or share in the produce. Experience with these schemes too has not been very encouraging for the companies, and in one major case (Ballarpur Industries Limited, SEWA Unit) resulted in litigation.

Several companies are currently focusing on tree improvement activities to make farm forestry more attractive. This requires considerable investment of time, money and effort into research and development (R&D) in order to identify suitable species and develop and multiply improved clones. The two most significant contributions of the corporate sector are the development of poplar clones by Wimco Limited in north-west India, and eucalyptus clones by





ITC Bhadrachalam Paper Boards Limited in Andhra Pradesh. That private sector R&D is successful is reflected in the popularity which improved clones have gained with farmers, even when commercial rates are charged. Information gathered from 12 companies indicates that they are supplying more than 50 million seedlings annually, covering an estimated area of 26,000 hectares. Over a quarter of this area is planted with seedlings of clonal origin. Clonal forestry seems to be a promising area where the corporate private sector can play an important role; a system of patenting clones would support this role. Problems encountered in partnerships can yet be addressed and overcome, but this remains an area whether further work and incentives are required.

The wood-based industry, especially the pulp and paper industry, has been lobbying for the past several years to be leased degraded forest lands for raising captive plantations. This is being strongly opposed by some NGOs and environmental action groups. The debate has reached a stalemate. One possible option that addresses several concerns of both sides could be leasing/ joint management by the corporate private sector of some of the *existing commercial plantations* raised by the Forest Development Corporations.

In recent years a number of private sector 'plantation companies' have been formed, which operate as collective investment enterprises. These companies started operating in the 1980s and mobilised huge investments from the general public, with the promise of very high, tax-free returns. Aggressively promoted through media campaigns and commission agents, such schemes are estimated to have mobilised between Rs 100 billion and Rs 250 billion, from between 2.7 and 15 million investors. However, the experience with these schemes has not been good and many investors are in danger of losing their investments. Most of these schemes were started with fraudulent intentions, which has given a bad name to the minority of genuine operations. Given that investor confidence in these companies is completely shaken, it is unlikely that they will play an important role in the forest sector in the near future, although the experience of such companies does indicate that it is possible to raise money for forestry projects from the market if tax incentives are provided to the investors.



## Farmers

As noted above, some 50% of the country's wood supply comes from non-forest sources, mainly farm lands. A review of India's substantial experience of farm forestry in the 1970s and 1980s points to some of the factors leading to its success in some areas, and its downfall in others. Detailed analysis of two areas where farm forestry is currently popular – western *Tarai* region of Uttar Pradesh and coastal Andhra Pradesh – indicates that a facilitative policy environment is a necessary, though on its own not sufficient, precondition for the adoption of farm forestry. The other critical factor behind farm forestry's popularity has been the R&D efforts of private sector companies. The main benefits of R&D have been identification of locally suitable species and development of high-yielding clones. The availability of these clones has made farm forestry popular with those looking for avenues for higher or more assured returns.

The learning which emerges from this study indicates that the availability of market and remunerative prices for farm forestry produce are likely to be major factors determining the future of farm forestry. The farmers' failure to get

remunerative prices for their produce was the most significant factor that led to decline of farm forestry in several regions in the late 1980s. It has been observed that, in both areas that were studied, farm forestry received setbacks in recent years primarily owing to the volatility of wood markets. Farm forestry markets are affected by a number of factors, including government policies, for example, those pertaining to raw material supplies to industries from forest lands and export and import of wood-based materials.

## Communities

Local communities are important stakeholders in India's forests. Around 15% of the country's population resides in the close vicinity of forests and derives much of its subsistence from them. During the past decade, JFM has spread through the country, bringing under its fold around 14 million hectares of forest lands. There are around 63,000 Forest Protection Committees (FPCs) in 27 states. The underlying concept is that village communities are engaged in the protection and regeneration of degraded forests<sup>1</sup> in return for certain usufruct rights, a share in harvest income and a role in the management of those forests. Whilst the precise provisions of rights and responsibilities vary from state to state, and whilst certain improvements to the JFM arrangement may be required, its spread and effectiveness to date is impressive, with real benefits to local communities.

Considering that a significant proportion of forest lands are under JFM, its potential for meeting commercial needs was studied by analysing the experience of the two pioneering JFM states, West Bengal and Haryana, where forests under JFM have reached maturity and regular harvests have started.



The study indicates that potential commercial production from JFM will depend on several factors including the kinds of land brought under JFM, forest management regimes, availability of market and so on. For instance, the scope for commercial production from fragile ecosystems that are brought under JFM (for example the Shivalik Hills region of Haryana) is limited as the emphasis in such areas is on restoration of ecological stability. This calls for maintenance of a good canopy cover that severely restricts the scope of final harvests and hence the availability of any kind of wood product, such as timber, poles, pulpwood, or fuelwood, which can be commercially traded. The commercial potential in these areas is for selected NTFPs only. However, potential for commercial production does exist in areas that are currently degraded but which have good regenerative potential and a species composition that yields a variety of produce as well as NTFPs – as illustrated by the case study of West Bengal. That potential is not always realised: in West Bengal, a number of mature JFM forests could not be harvested as there was no market for *sal* (*Shorea robusta*) and eucalyptus poles. The presumption that there is large unsatisfied demand for various forest products and thus all produce from JFM areas can be easily marketed does not seem to be valid.

While it appears that linking commercial interests with JFM will lead to beneficial impacts for the community as a whole, it is important to ensure that

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1. In some states (such as Madhya Pradesh) JFM has been extended to good forests.

the impacts are equitable and not biased against the poor, marginalised and other disadvantaged sections of the society. Further, it is necessary to ensure that subsistence needs have primacy over commercial production.

## Promoting sustainable management: a case study of the ayurvedic industry

As much as 70% of India's population uses traditional medicine, and exports are increasing rapidly. The potential that the international market holds is very large, but there are concerns over quality and sourcing of material, given that there is much adulteration of herbs. This growing demand and consequent depletion of stock has meant that particular raw materials are becoming increasingly scarce; in some cases they are already extinct and 'second best' herbs have to be substituted. As a response, a number of large herbal pharmaceutical companies are engaged in generation of planting material and seeds, development of agricultural techniques and cultivation through partnership/ contract arrangements with farmers. However, the industry's response to the raw material crisis is seen as being rather limited, and does not address wider sustainability issues.

The supply chains of ayurvedic herbs tend to be long, and collectors/ cultivators get only a fraction of the final price. Information flow along the chain is linear, with no direct contacts between collectors/ cultivators and final consumers (or often even the company marketing the processed product). However, there appears to be limited scope for semi-processing at the village level.

Recently, the Planning Commission identified ayurvedic herbs as a thrust area for export promotion. While current exports are around Rs 4.46 billion, the target is to increase this to Rs 30 billion by 2005 and to Rs 100 billion by 2010. There is a danger that such a rapid increase in exports may lead to unsustainable harvesting, underscoring the need for urgent measures, including application of market-based instruments, to ensure sustainable harvests. Some of the criteria and indicators for sustainable management developed under the 'Bhopal-India process' may be used for the purpose.<sup>2</sup> However, further work needs to be done on the development of a possible standard for the management of forests for ayurvedic herbs.



## Process of policy change

Policy change is a complex process and involves interaction between a number of players. The main mechanism adopted by the Central Government (specifically the Ministry of Environment and Forests) for moving towards policy change appears to be the constitution of committees charged with researching, debating and analysing specific policy issues leading to policy recommendations. While constitution of around 10 such committees in the past four to five years indicates the keenness for policy change, the actual progress has been somewhat slow. This is perhaps due to the inability of the policy makers to efficiently deal with multiple (and often conflicting) demands for various forest goods and services. Another reason could be the lack of involvement of all stakeholders, as most government-appointed committees tend to be dominated by the forest bureaucracy.

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2. A process of development of forestry standards for India, hosted at the Indian Institute for Forest Management in Bhopal.

NGOs as well as forest-based industries have also influenced policy making processes in recent years through direct lobbying, preparation of analytical papers, participation in committees and other policy fora, agitation and legal action (the last two being used mainly by NGOs).

In recent years, the higher judiciary has also started to play an important and proactive role in policy matters related to the environment. The judgements of courts in several Public Interest Litigation cases have virtually decided the policy direction. This is largely seen as a result of the failure of the *executive* to implement policies effectively.

In order to understand how policy change takes place in reality, the process was examined in detail through a case study. The study focuses on the *Lok Vaniki* (people's forestry) initiative in Madhya Pradesh, which was started in 1999 to promote forestry on non-forest lands. It aims to make tree farming attractive to landowners by providing a suitable legal, institutional and market environment.

Whilst the *Lok Vaniki* scheme is as yet in the inception stage, institutional structures are still being created (intentionally slowly), and the potential benefits lie some years in the future, the process of policy change is of great relevance to this study and may provide a useful example for other states. The role of exposure visits, the importance of dovetailing policy change to larger political processes and the need for an integrated 'mission'<sup>3</sup> approach are highlighted.



## Recommendations

While the government has dominated the Indian forestry sector for the past 150 years, there is a growing realisation that the private sector should be encouraged to play a greater role than it has hitherto played, to effectively address the key challenges facing the sector, i.e. continuing forest degradation, increasing demand-supply gap, and dwindling government resources.

The private sector is already making significant contributions to sustainable forestry in India. However, its role can be further enhanced if existing bottlenecks are removed and positive incentives are provided. Some of the major recommendations for enhancing the role of different private sector players are given below.

### Corporate private sector

Company-farmer partnership schemes may be perceived to have failed in terms of the original objectives of the companies, but they have demonstrated the potential for farmers participating in such schemes to produce timber for industry and to sell in the open market. These schemes have clearly contributed to the expansion of farm forestry, but both companies as well as farmers are at the mercy of a potentially volatile and risky market. In order to ensure mutual benefits to both companies and farmers, and measures which could lead to workable partnership arrangements, recommendations include:

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3. A 'mission' approach indicates that that scheme will be implemented expeditiously with inter-departmental cooperation and that the scheme will continue until its objectives are met.

- Simplification of bank loan procedures and clarity in agreements between companies and farmers;
- Simplification and clarity in legal provisions pertaining to leasing of farm lands by companies/ share cropping agreements for raising tree crops, especially in scheduled areas;
- Formation of tree farmers' associations to strengthen farmers' bargaining power, facilitate companies' dealings with farmers and to provide economies of scale.

R&D has, in recent years, emerged as an area where the corporate private sector has a real and demonstrated comparative advantage. Companies such as Wimco and ITC Bhadrachalam Paperboards Limited have made great progress in the development of new clones, for which farmers and, in some cases, Forest Development Corporations are prepared to pay a premium. Such companies are investing in research without state support and without guaranteed direct returns – although the take-up of clonal plants has been so extensive that wood-based industry as a whole may expect somewhat improved supplies in the future. To capitalise on the corporate private sector's comparative advantage in R&D the following is recommended:

- Provision of government funding for specific research projects;
- Incentives such as tax concessions for investment in R&D;
- Development of a system of registration of clones;<sup>4</sup>
- Development of a system for certification of tree seeds and clonal planting stock.

A large area under commercial plantations is currently being managed by the Forest Development Corporations but both productivity and incentives for improving plantations are low. The issue of leasing degraded lands for establishment of new plantations has been debated extensively and is only summarised in this report; however there is potential to improve existing plantations. Further, whilst maintaining the land ceiling system can be justified for the reason of equity, some policy amendments could encourage expansion of area under tree crops. Regarding plantations, the following is recommended:

- Involvement of the corporate private sector in the management of *existing* commercial plantations along with Forest Development Corporations;
- All fresh plantations by Forest Development Corporations should be raised using improved planting stock, which can be procured from private sector companies;
- For the purposes of land ceiling, forestry should be treated at par with other plantation crops.

Investment in India's forestry sector is very low, although recent initiatives such as those of collective investment enterprises have demonstrated the potential for – in this case – public investment. Given the resource crunch it may be unreasonable to expect significant increases in funding from the state sector, but the following recommendations are suggested to provide incentives for enhanced private sector investment:

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4. The recent introduction of the Protection of Plant Varieties and Farmers' Rights Act may address some of the concerns of the corporate sector engaged in forestry R&D. However, much will depend on the Act's effective implementation on the ground.

- Setting up a reforestation fund by allocating entire cess funds and 20% of the excise duty collected from paper and other wood-based industries;
- NABARD should consider lending long-term loans for forestry activities at concessional rates;
- Tree growers should be helped to insure their plantations at competitive rates of premium;
- Incentives for efficient conversion of raw material should be built into the structure of taxes;
- All plantation schemes registered with the Securities and Exchange Board of India should be declared as industry;
- Tax concessions should be granted to those investing in plantation schemes.

It is not customary for the corporate private sector to share information on such issues as R&D and the details of partnership schemes. Whilst competitive advantage is clearly dependent on some degree of confidentiality, sharing experience and lessons could be to the mutual advantage of companies. Hence a further recommendation is:

- The corporate private sector should be encouraged to seek ways to share information of mutual benefit to those companies and their clients.

## Farmers

The great potential of farm forestry has already been demonstrated in the 1970s and 1980s; and its subsequent downfall widely documented. This experience paves the way for a number of measures that could significantly enhance the potential of individual farmers in certain regions of India to both increase farm-based contributions to industrial wood supply, and improve their own livelihoods. The following policy measures are recommended:

- There is a need for a nationwide review of all laws and procedures constraining farm forestry;
- A national policy on farm forestry should be formulated, but with sufficient flexibility to allow for a region-specific approach, thus taking into account regional variation and maximising the potential of farm forestry;
- Rules and procedures for felling, transport and sale of major farm forestry species should be totally liberalised and the local *panchayati raj* institutions should be given powers to issue necessary passes with respect to less common farm forestry species;
- The existing policy of state monopoly on trade of most commercially important NTFPs should be reviewed;
- Laws governing the management of private forests need to be liberalised;
- Incentives for tree farming, such as nationally tradable afforestation credits, should be introduced;
- The government may consider revoking the ban on exports of wood-based products and imposing a higher duty on import of wood-based raw material to safeguard the interests of domestic producers. Industry may be given some concessions in excise or sales tax;
- Policies such as state monopsony over certain forest products and supply of forest products at concessional rates to various users should be reviewed;
- Whether the government should continue to raise farm forestry species on forest lands that can be more easily and efficiently grown by the farmers on their farm lands should be reconsidered.



Farm forestry in certain regions has been given a significant boost by R&D efforts of the corporate private sector, as noted above. Research support for farm forestry could expand the range of commercially tradable species, identify species appropriate for particular environments and extend the option of farm forestry to some of those for whom it has not been viable to date. The following research initiatives are recommended:

- Suitable farm forestry species for different areas should be identified and tree improvement work on promising indigenous species should be initiated;
- New uses for produce from popular farm forestry species should be developed;
- Government research institutes should focus on areas where the private sector is unlikely to take an interest, for example species and practices suitable for poorer farm foresters;
- Environmental impacts of taking up farm forestry on a large scale in a region should be studied by an independent body;
- The policy of supply of subsidised seedlings to the farmers should be reviewed and some of the resources devoted to providing subsidies should be reallocated for developing and producing better and higher yielding clones, which may be supplied in lesser numbers and at higher rates to farmers willing to invest in farm forestry.

Market information is key: the availability of market and remunerative prices are likely to be major factors in determining the future of farm forestry. Agricultural markets provide good experience upon which the forest sector could draw. In addition, the volatility of markets is a significant risk. It is recommended that:

- As more farmers take up farm forestry, a system of market regulation along the lines of agricultural markets needs to be put in place;
- A suitable market information system, again similar to that of agricultural markets, should also be introduced to inform the farmers regarding major buyers, prevailing prices at different places, trends, procedures, etc.



## Communities

JFM has expanded greatly over the last decade and has demonstrated the potential for communities to take responsibility for managing their forest areas. The focus has been on establishment of joint management arrangements and mechanisms for sharing benefits largely for subsistence use. However, production from certain areas under JFM has thrown up the possibilities of viable commercial production. The study examined the commercial potential of JFM in two states and presents the following policy recommendations:

- The JFM programme should be given a firm legal standing with FPCs having proper legal identity;
- The share in the forest produce and income offered to the FPC members should be adequate to maintain their interest in the programme;
- Policies constraining commercial production from JFM areas such as certain restrictions on forest produce movement across state borders should be reviewed.

However, the original reasons for initiating JFM should not be forgotten, and subsistence and ecological concerns not be sacrificed in favour of commercial

activities. To ensure that poor and forest-dependent communities continue to benefit from JFM, the following is recommended:

- Meeting subsistence needs of forest-dependent communities should be unambiguously stated as the first charge on JFM areas. Only surplus production should be considered for commercial use;
- Ecologically fragile areas brought under JFM should not be considered as a source of commercial production;
- The impacts of commercial use should be equitable and not biased against the poor, marginalised and other disadvantaged sections of the society;

Even where commercial production is feasible and does not jeopardise subsistence needs, the presumption that there exists unsatisfied demand for all forest products does not seem valid. Markets for such produce are likely to be region-specific, and may be subject to much fluctuation. Furthermore, JFM groups may require financial, institutional and marketing assistance:

- In several areas, the product mix from JFM forests may have to be adjusted to suit market demand. Alternatively, the option of setting up or relocating processing units should be explored;
- The recent experiments in Andhra Pradesh and Tamil Nadu on provision of bank credit for JFM and linking of FPCs with industries should be closely monitored. Other states should also explore possibilities of obtaining NABARD credit for supporting JFM.



## Ayurvedic industry

Given that there is a large unorganised sector within the ayurvedic industry, obtaining reliable information on the status of the resource and the extent of the trade is difficult, yet vital for planning future development of the industry. It is recommended that some baseline information be gathered and made public:

- An inventory of commercially important medicinal plants should be done to get the true picture of production potential, their conservation status, use practices, etc;
- A comprehensive survey of the quantum of medicinal plants used along with the sources of supply should be carried out. A ready reference guide for correlating trade names of medicinal plants to their botanical names should be prepared to help in estimating the volume of trade of different species.

There is a crisis in supply of ayurvedic herbs and unsustainable and destructive extraction has been widely reported. There are a number of measures which can be taken to improve sustainability; whilst some of these are long-term, others may be implemented in the short-term in certain areas:

- In the absence of full knowledge of sustainable harvesting regimes for different products, at least 50% of the fruits, roots, leaves, flowers and other materials collected should be left on the plant for future regeneration;
- There is a need to control premature harvesting of products such as fruits of *Emblica officinalis*;
- Forest areas from where medicinal plants are extracted should be brought under sustainable forest management practices. Application of criteria and indicators



- developed under the Bhopal-India process will help to track progress towards sustainable forest management;
- An appropriate legal and policy framework should be developed to control unsustainable harvesting and other malpractices (adulteration, premature harvesting, use of substandard raw material, lack of scientific validation-certification, etc).

Enhanced benefits at the local level can be a factor in moving towards the sustainable management of medicinal plants as well as contributing to improved livelihoods for local collectors, who are often poor and tribal populations. The following is recommended:

- Value addition and processing at the collector level should be encouraged so that the collectors can earn the same amount of income from much less quantity;
- Direct links between the processing industry and primary collector/ cultivator should be encouraged;
- Given that the collection and trade of medicinal plants are highly unorganised at the local level, it is recommended that local institutions such as FPCs be strengthened and cultivation and conservation of medicinal plants be integrated into the JFM programme;
- Collectors of medicinal plants should be organised to reduce the stranglehold of middlemen on trade. The successful *Van Dhan* (forest wealth) committee model of Bastar district should be replicated elsewhere.<sup>5</sup>

The Planning Commission predicts potential exponential growth in exports of ayurvedic medicines, and the domestic market continues to grow. There is a need for both safeguards against over-exploitation and the removal of barriers to market development:

- The current thrust of the Planning Commission on increasing exports of ayurvedic formulations should be used as an opportunity to explore niche markets for certified ayurvedic products;
- The increasing supply of medicinal plants should be carefully monitored to prevent over-exploitation in the effort to meet export targets;
- At present, export of prohibited plants (29 species including those in Appendix I and II of CITES<sup>6</sup>) is possible if these are present in some formulation (as against raw form) or if the label of the formulation does not mention the name of the species. This policy should be urgently reviewed.

Certain medicinal plants are amenable to cultivation while others grow only in certain environments, particularly forests. A number of attempts at cultivation of medicinal plants have been made, with mixed results.

- A comprehensive review regarding the current status of cultivation of medicinal plants in the country should be carried out. Existing bottlenecks being faced by farmers as well as companies should be identified and removed;

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5. Under the Van Dhan programme, tribal collectors of NTFPs (mainly tamarind) in Bastar have been organised into committees and through collective action and government support they have been able to increase their income several fold, mainly through better marketing strategies.

6. CITES: Convention on International Trade in Endangered Species.

- Large-scale cultivation of medicinal plants should be taken up with caution. The certification criteria of WHO (GAP: Good Agricultural Practices) should be applied for the products from *ex situ* sources.

As noted above, the ayurvedic industry is quite unorganised and until recently there has not been a central body which considers all issues concerning medicinal plants. There is a plethora of organisations dealing with various aspects of medicinal plants. A number of ministries, particularly the Ministry of Environment and Forests, have responsibilities for different aspects of the trade, but there is a need for a dedicated organisation. It is therefore recommended that:

- There should be a nodal organisation at national level to bring together various stakeholders and to deal with the entire range of issues pertaining to medicinal plants. It is hoped that the recently constituted Medicinal Plants Board would fulfil this role.

## Conclusion

The era of economic liberalisation that started in the early nineties has resulted in the greater role of the private sector in almost all spheres of life in India – from television to infrastructure development. However, the forestry sector continues to be controlled by the bureaucratic machinery.

The challenges facing the sector are immense and bureaucracy cannot handle these alone. Over half the forest lands are degraded and at least a sixth are virtually devoid of tree cover. The productivity of forests is very low and growing stock per hectare is only 40% of the world average. The annual gap between demand and sustainable supply is 37-38 million m<sup>3</sup> in case of industrial wood and a staggering 121 million metric tonnes in the case of fuelwood. This gap is currently being met largely through unsustainable removals from government forests and other lands. The Ministry of Environment and Forests has estimated that an annual budget of Rs 52.85 billion is needed to fulfil the objective of improving forest cover. Against this, the total current availability is only Rs 16.15 billion.

While different private sector players are contributing significantly to the Indian forestry sector, their current contribution is far below their potential. There is a need to loosen bureaucratic control and to simplify procedures to allow the private sector to contribute more effectively. There is also a need to promote transparency, which will curb the corruption that plagues forestry like most other sectors in the country.

If the recommendations listed above are acted upon by policy makers, not only could the private sector meet the country's requirements of forest produce, but India could emerge as a major exporter and world player in forestry.

# Preface

This report is the outcome of a study carried out in India under a wider international project entitled ‘Instruments for Sustainable Private Sector Forestry’, coordinated by the London-based International Institute for Environment and Development (IIED). It aims to understand the current situation, trends and potentials with respect to private sector participation in sustainable forest management; to review the impact of sectoral and extra-sectoral policies on private sector participation; and to explore strategic options for the private sector to contribute to sustainable forest management in India.<sup>1</sup> Apart from India, studies in four other countries – Brazil, China, Papua New Guinea and South Africa – have also been carried out. In addition, a global review of private sector participation in sustainable forest management and papers on selected themes such as company-farmer partnerships, markets for environmental services and certification have been prepared (see the box describing the series on the inside front cover of this book).

The research for this study was carried out by a team coordinated by Ecotech Services (ETS), in collaboration with IIED. During a scoping phase in 1999 an ETS/IIED team visited around forty stakeholders with interests in participation of the private sector in India’s forestry sector. They included representatives of central and state governments, industry, donor agencies, research and academic institutions and NGOs. Subsequently, a planning workshop was held in New Delhi in August 1999, and was attended by over thirty people. Potential issues for research were discussed in this workshop. Based on the scoping exercise and inputs received during the planning workshop, a detailed work plan was drawn up.

Ten different sub-studies were carried out as part of the India country study (see box below for details).<sup>2</sup> The research for these was carried out during 2000.



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1. In the context of this study, the term ‘private sector’ is interpreted broadly such that it includes all those who engage in commercial activity concerning forest goods and services – be they individuals, community groups, informal sector groups or the large-scale corporate sector. The focus of this study is on commercial goods and services; issues concerning subsistence use of forests are addressed only where they have a direct bearing on sustainability e.g. in joint forest management programmes.

2. In addition, a report titled *The Advent of New Agroforestry in India and Wimco* was prepared by N.K. Joshi and J. P. Chandra.

## List of sub-studies

1. *Demand and supply of selected forest products* by N.B. Majumdar, Indian Institute of Forest Management, Bhopal

There have been several estimates of demand and supply of specific forest products such as fuelwood, industrial wood, pulpwood, bamboo, and so on. However, estimates made by different organisations and individuals often vary, being based on different samples and sets of assumptions. The existing data is also often scattered and difficult to access. This study collates and synthesises existing demand and supply data with respect to selected forest products, and describes the assumptions on which such data is based.

2. *An assessment of the small-scale/informal forestry sector* by R.K. Shukla, National Council for Applied Economic Research, New Delhi

The ground reality with respect to demand and supply of different forest products is usually different to what is presented in the official figures, as these often ignore 'informal' sources of supply (e.g. fuelwood headloaders) and demand (e.g. small-scale sawmills). This study attempts to assess the ground situation concerning demand and supply of certain forest products and the role being played by the small-scale and 'informal' sectors. It is mainly based on the primary survey carried out in two locations – Yamuna Nagar in Haryana and Rajkot in Gujarat.



3. *Policies affecting private sector participation in sustainable forest management* by Daman Singh, Ecotech Services, New Delhi\*

The private sector's participation in forestry activities is determined by policies at the central and state levels. Apart from the policies directly related to forests, policies and legislation introduced for other sectors also impinge on private sector participation e.g. land ceiling on agriculture lands, export-import policies, tax laws etc. This study provides an overview of the policy environment for private sector participation in forestry activities.

4. *Current role and activities of the large-scale private sector in forestry development* by Piare Lal, ITC Bhadrachalam Paper Boards Limited, Hyderabad

Over the years, the role of the corporate private sector has been declining in government forests but it has started to play a greater role in promoting tree planting on non-forest lands. This study presents an overview of the current role of the large-scale wood-based industry in forestry and analyses the constraints that are preventing the industry from contributing to its full potential.

5. *Review of company-farmer partnerships for the supply of raw material to wood-based industry* by Sushil Saigal and Divya Kashyap, Ecotech Services, New Delhi\*

The national forest policy clearly indicates that forest-based industry should meet its raw material needs by establishing direct relationships with farmers. While a number of companies have attempted to forge partnerships with farmers in the

past few years, the experience has been somewhat mixed. This study analyses the experience gained from partnership schemes started by four companies and provides suggestions for improvement.

6. *The second green revolution: analysis of farm forestry experience in western tarai region of Uttar Pradesh and coastal Andhra Pradesh* by Sushil Saigal and Divya Kashyap, Ecotech Services, New Delhi\*

Farm forestry was promoted in a big way by the government during the 1970s and 1980s. Farmers in several states planted trees on a large scale. However, due to a variety of reasons, most farmers had abandoned tree planting by the end of the 1980s. In recent years, farm forestry has again become popular among farmers, although its popularity is limited to certain regions only. This study documents the farm forestry experience in the 1970s and 1980s and, through detailed case studies of two districts, analyses the reasons behind the current popularity of farm forestry among local farmers.

7. *Potential for commercial production from forests under Joint Forest Management* by Hema Arora, Anjali Mohan Bhatia and Snigdha Chakraborty, Ecotech Services, New Delhi\*

Around 18% of India's forest land is already under joint forest management (JFM). Given the considerable area under JFM, these forests could well be important sources of raw material in the future. This study examines the potential for commercial production from JFM forests by analysing the situation in Haryana and West Bengal – two states where the JFM programme is long-established and where forests under JFM have reached a level of maturity.

8. *Market-based instruments for the sustainable management of medicinal plants* by Niraj Subrat (Baidyanath Industries, New Delhi), Meera Iyer (Ecotech Services, New Delhi) and Ram Prasad (Indian Institute of Forest Management, Bhopal)\*

The ayurvedic industry is an important forest-based industry, which uses a large quantum of medicinal plants that are mainly procured from the wild. The domestic market for ayurvedic formulations is expanding rapidly and the government is planning to substantially increase exports. There is danger of over-exploitation of the medicinal plant resources if corrective steps, involving the industry, are not taken. This study examines the potential application of certain market-based instruments to promote sustainable utilisation of these resources.

9. *The role of policy fora and other stakeholders in influencing private sector participation in sustainable forest management* by Devaki Panini, Ecotech Services, New Delhi

This study analyses the role of different policy fora and stakeholder groups in influencing policy processes. The case of leasing of forest lands to industry is analysed and the role of NGOs and the Supreme Court is highlighted.

10. *Study of the process of forest policy change in Madhya Pradesh* by S. Raghavan, Indian Institute of Forest Management, Bhopal and P. Srivastava, Madhya Pradesh Forest Department\*

Recently Madhya Pradesh has introduced significant policy changes to encourage private sector participation in forestry. This study analyses the process of policy change and lists reasons that made positive policy change possible.

Those sub-studies marked with \* are published in full as separate reports, available from ETS or IIED.

A workshop was held in New Delhi in June 2000 to review the progress of different sub-studies. It was mainly attended by those directly associated with the study though some outside experts also contributed their comments and feedback.

After most of the studies were completed, a final 'findings discussion workshop' was organised in New Delhi in December 2000. This was attended by a large number of people representing different stakeholder groups. Top policy makers from the Planning Commission and the Ministry of Environment and Forests also attended this workshop and discussed the findings of different sub-studies.

This synthesis report draws on all the above sub-studies and workshop deliberations, which are treated as source material and are thus not individually referenced. Some additional research work was also undertaken out during the synthesis phase, especially on the context of forestry, funding situation, plantation companies and the role of Forest Development Corporations. Some further work on the demand and supply situation and the role of policy fora was also carried out.



This report is organised in eight sections. Section 1 presents the current context of the forestry sector in India and includes a brief description of the forest resource, the funding situation and the demand and supply scenario with respect to major forest products. The policy environment for private sector participation is described in Section 2. Sections 3, 4 and 5 describe the roles currently played by the different private sector players – the corporate private sector, farmers and communities – in forestry. The experience generated so far in farm forestry, company-farmer partnerships and joint forest management is analysed and factors that can further enhance their participation are identified. Section 6 presents a case study of the ayurvedic industry and assesses the potential applicability of market-based instruments for ensuring a sustainable supply of medicinal plants. Recognising that policy changes will be required to facilitate private sector participation and acknowledging that policy change is often difficult to achieve, the process of policy change is analysed in Section 7. A case study of the policy change process in Madhya Pradesh is presented where a number of positive policy changes have been introduced recently to promote private sector participation in forestry. The case study throws up a number of lessons, which may be relevant for the rest of the country. Whilst key issues from each section are summarised at the end of that section, conclusions and recommendations derived from the first seven sections are presented in Section 8.

# Acknowledgements

This report is the result of a year-long collaborative research project and it synthesises the findings of ten sub-studies carried out under the project. The details of topics covered in sub-studies are given in the preface. We would like to thank all the sub-study authors for their substantial contributions to this study: Mr. N.B. Majumdar of the Indian Institute of Forest Management; Dr. R.K. Shukla of the National Council of Applied Economic Research; Mr. Piare Lal of ITC Bhadrachalam Paperboards Limited; Mr. Niraj Subrat of Baidyanath Industries; Dr. Ram Prasad of the Indian Institute of Forest Management; Mr. S. Raghavan of the Indian Institute of Forest Management; and Ms. Daman Singh, Ms. Divya Kashyap, Ms. Anjali Bhatia, Ms. Snigdha Chakraborty, Ms. Meera Iyer and Ms. Devaki Panini of Ecotech Services. The paper written Dr. N.K. Joshi and Dr. J.P. Chandra of Wimco was also very useful.

Many individuals and organisations have provided help during the project, our thanks are due to all of them. We would specifically like to express our gratitude to those who attended the three workshops organised at different stages of the project and who provided valuable inputs. A list of those who attended the workshops is given in Annex 12.

It would not have been possible to complete this project without the constant support of Ms. Elaine Morrison, who coordinated the Indian component of the wider project at IIED. Dr. Gill Shepherd of the Overseas Development Institute provided valuable guidance during the design phase and played a key role during the workshops. She also provided useful comments on individual sub-studies and on this synthesis report. Dr. Kevin Crockford of the Department for International Development–India (DFID), provided valuable inputs during the design phase and constantly encouraged the team. Mr. D.K. Dhaukia of Ballarpur Industries helped in understanding the industry’s perspective and facilitated the establishment of contacts with various industries.

Mr. R.P. Mattoo, Chief Technical Director of ETS, provided general guidance throughout the project. Ms. Sutapa Baidya of ETS assisted in additional research while this country synthesis report was being prepared. Ms. Sutapa Baidya and Mr. Ajay Kumar of ETS helped with the logistics of the workshops. Mr. James Mayers and Ms. Elaine Morrison of IIED read through earlier drafts of this report and provided detailed comments and useful suggestions.

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Whilst this synthesis paper is hugely indebted to the sub-studies on which it draws, the opinions expressed are those of the authors alone, and not necessarily those of the sub-study authors, IIED, ETS, DFID or the EC.

**Sushil Saigal, Hema Arora, S.S. Rizvi**



# Acronyms

AAPCI	Association of Agri Plantation Companies of India
AMC	Agriculture Marketing Committee
APPM	Andhra Pradesh Paper Mills Limited
BILT	Ballarpur Industries Limited
C&I	Criteria and Indicators
CIMC	Collective Investment Management Company
CITES	Convention on International Trade in Endangered Species
CSE	Centre for Science and Environment
DFID	Department for International Development
EC	European Commission
ETP	Entire Transplant of Poplar
ETS	Ecotech Services (Private) Limited
FCA	Forest Conservation Act
FD	Forest Department
FDC	Forest Development Corporation
FPC	Forest Protection Committee
Gol	Government of India
GAP	Good Agricultural Practices
HRMS	Hill Resource Management Society
IFFCO	Indian Farmers' Fertiliser Cooperative Limited
IFFDC	Indian Farm Forestry Development Cooperative Limited
IIFM	Indian Institute of Forest Management
IIED	International Institute for Environment and Development
ITC BPL	ITC Bhadrachalam Paperboards Limited
JFM	Joint Forest Management
LAMPS	Large Scale Adivasi Multi-Purpose Cooperative Societies
MoEF	Ministry of Environment and Forests
MT	Metric Tonne
NA	Not Available
NABARD	National Bank for Agriculture and Rural Development
NCA	National Commission on Agriculture
NDDB	National Dairy Development Board
NFAP	National Forestry Action Programme
NGO	Non Government Organisation
NTFP	Non-Timber Forest Products
NTGCF	National Tree Growers' Cooperative Federation Limited
PCCF	Principal Chief Conservator of Forests
Rs	Rupees
R & D	Research and Development
SEBI	Securities and Exchange Board of India
SPS	Samaj Parivartana Samudaya (NGO)
SWOT	Strengths, Weaknesses, Opportunities and Threats
TPA	Tonnes per Annum
TRIFED	Tribal Cooperative Marketing Development Federation
TRIPs	Trade Related aspects of Intellectual Property Rights
USAID	United States Agency for International Development
WB	World Bank
WC	Working Circle
WHO	World Health Organisation
WTO	World Trade Organisation
WWF	World Wide Fund For Nature

£1 = Rs. 70 approximately

In November 2000, three new states were created: Uttaranchal, Jharkhand and Chhattisgarh. Except where stated, figures given in the report relate to the states as they were prior to the creation of these new states.





# Introduction

## 1.1 Challenges facing India's forestry sector

The Indian forestry sector is currently undergoing a major transition. The current forest policy, introduced in 1988, and the economic liberalisation programme, started in 1991, have fundamentally altered the direction of forestry. The forest policy has changed the objectives of management of government forests from timber production and revenue generation to conservation and meeting the subsistence needs of forest dependent communities. Furthermore, under the regime of market liberalisation, the import of forest raw material has been made easier, and domestic forest-based enterprises now have to face stiff competition from foreign companies.

In view of these changes there is a rethink under way, both within and outside the government, on the role of different players – such as the government, corporate sector, individual farmers and community groups – in order to sustainably manage forest resources and meet the needs of various users of forest products and services. Thus, initiatives have been taken to increase commercial output of forestry products from non-forest lands and to involve local communities in the management of government forests.

The corporate private sector has realised that the days of subsidised supplies and protected markets are over, and it has to constantly innovate in order to survive in the new, more competitive environment. Novel methods for ensuring raw material supply are being tried out (e.g. several companies have started outgrower schemes (see Section 3.1) and better and higher value uses are being found for the available raw material (e.g. furniture from eucalyptus timber). Several companies are engaged in research and development of improved higher-yielding clones.

Farm forestry, which declined after its first flourish in the 1980s, is staging a comeback in several regions as new clonal varieties have once again made it an attractive option for farmers wherever markets for their products exist. However, they have to compete with cheap imports now allowed by the government.

The joint forest management (JFM) programme that aims to protect and regenerate government forest lands with the active involvement of local communities now covers nearly 14 million hectares or more than 18% of the country's forest lands. Over 63,000 village groups<sup>1</sup> are reportedly involved in the programme. The JFM programme has resulted in rapid regeneration of degraded forest lands in several parts of the country. While the initial doubts regarding the ability of local

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1. Commonly known as Forest Protection Committees or FPCs.



communities to protect forests have been laid to rest, the long-term sustainability of the JFM forests is still being debated. In most states, the JFM efforts in the initial years were supported through externally assisted projects. As these projects draw to a close, alternative ways of supporting the JFM programme, such as obtaining credit from banks and linking it with the wood-based industry, are being explored.

Although many of the above developments have been supported by the government through appropriate policy change, there still remain significant policy bottlenecks that inhibit or restrict private sector participation in sustainable forest management. These range from restrictions on tree felling and transport to lack of patent protection for private sector companies developing new clones through research and development.

While existing rules and procedures were made with good reasons in the past, many of these need to be reviewed in the present context. Similarly, new rules (e.g. patenting of clones, regulation of wood markets) may need to be introduced in light of developments in recent years. Many of these issues are now the subject of lively debate in India.

Thus, the transition that the Indian forestry sector is currently undergoing presents both threats to the 'old order' and a number of opportunities for change. Many of these opportunities concern the role that the private sector players can play in sustainable forest management. This study aims to bring all this together and take stock of the situation. The specific objectives of the study are to:

- understand the current situation, trends and potentials with respect to private sector participation in sustainable forest management
- review the impact of sectoral and extra-sectoral policies on private sector participation
- explore strategic options for the private sector to contribute to sustainable forest management in India.

#### Box 1.1 India – some facts

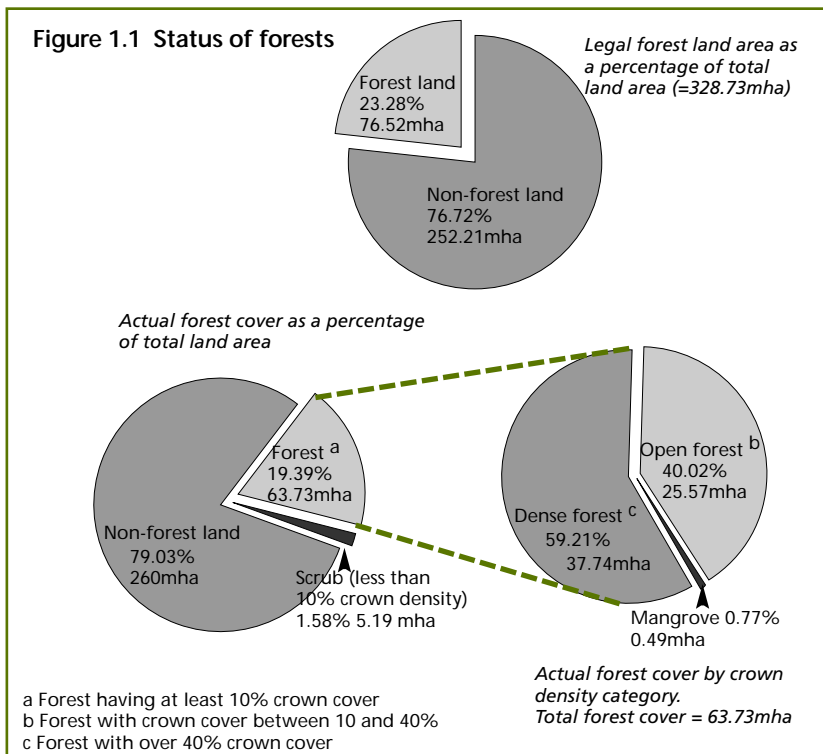
- India is the second most populous country in the world with a population of over one billion. One in every six persons in the world is an Indian.
- While India's share in the world population is about 16%, it has only 2.5% of the world's land resources.
- Nearly three-fourths of the population lives in rural areas.
- Agriculture is the mainstay of India's economy contributing 30% to Gross Domestic Product and 65% to employment.
- About 60% of the land holdings fall into the marginal category (<1 hectare).
- India has the world's largest livestock population.
- Over half the country's area is subject to different kinds of degradation.
- India is also one of 12 mega-diversity countries of the world.

## 1.2 Overview of the Indian forestry sector

### 1.2.1 Current status of the resource

Around 23% of the country's area (76.52 million hectares) is officially classified as forest land.<sup>2</sup> Almost the entire forest area is owned and managed by the government. According to official estimates, 93% of forest area in the country is controlled by the Forest Department (FD)<sup>3</sup> and 4% by the Revenue Department. In contrast, corporate bodies and communities own 1.5% of the forests while private forests comprise a mere 1.5% of all forests (ICFRE 1996). The per capita forest area in India works out to 0.08 hectare, which is one-eighth of the world average of 0.64 hectare (FAO 1995).

Not all the legally classified forest lands carry forests.<sup>4</sup> At least 17% of forest lands are virtually devoid of tree cover (crown density below 10 per cent) and another 33% have degraded open forest (crown density 10-40%). Less than half the forest lands have reasonably dense forest (crown density above 40%) (FSI 1999).<sup>5</sup> The current status of forests in India is summarised in Figure 1.1.



Source: FSI 1999

2. Forestry is the second major land use in the country after agriculture.

3. Each state has a FD that functions independently of FDs in other states. The policy framework and broad guidelines for all states are decided by the Ministry of Environment and Forests (MoEF) at the central government level. See Section 1.2.3 and Annex 1 for further details.

4. The officially recorded forest lands are mainly classified into two main categories – reserved forests and protected forests.

5. In reality, the condition of forest lands is likely to be worse than these figures indicate, as some of the forest cover recorded is probably outside the notified forest lands.

The forest cover of the country consists of plantations as well as natural forests. The available figures for 1995 indicate that out of 65 million hectares actual forest cover in that year, only 50.38 million hectares (77.5%) were under natural forests, while the remaining 14.62 million hectares (22.5%) were plantations (GoI 1999).

The Forest Survey of India has estimated the growing stock of the country to be 4,740 million m<sup>3</sup> with an average volume of 74.42 m<sup>3</sup> per hectare. The total annual increment of growing stock has been estimated at 87.62 million m<sup>3</sup> (FSI 1997). Of this, about 60% (52.62 million m<sup>3</sup>) is estimated to be timber and 40% (35 million m<sup>3</sup>) fuelwood. This represents about 1.38 m<sup>3</sup> of growth per hectare per year (taking into account only 63.73 million hectares area having forest cover), compared to a global average of 2.1 m<sup>3</sup> per hectare per year. If one considers the entire legally classified forest land, the average drops to 1.15 m<sup>3</sup> per hectare per year.

The productivity of Indian forests is significantly below the regional and global average, and is cause for deep concern. A comparison of the Indian situation with the regional and global situations is given in Table 1.2. The situation is presumably the result of the high rural population and the resulting high biotic pressure.

**Table 1.2 Comparison of growing stock and biomass in natural forests of India with that in other countries (1990)**

Parameter	India	Tropical Asia	Asia-Pacific region	Developing countries	World
Growing stock of wood (m <sup>3</sup> /ha)	47.00	140.00	125.00	113.00	114.00
Biomass (MT/ha)	93.00	181.00	171.00	169.00	131.00
Growing stock per capita (m <sup>3</sup> )	2.85	28.00	18.90	54.90	71.76
Biomass per capita (MT)	5.63	36.27	25.76	81.73	82.37

Source: FAO 1995, in GoI 1999

### 1.2.2 Forest trends

In the years after independence, large tracts of forests were diverted for non-forestry purposes such as agriculture, hydroelectric projects and other development projects. It is estimated that the rate of diversion between 1950 and 1980 was about 150,000 hectares per year. In 1980, the central government enacted the Forest (Conservation) Act with the intention of arresting this process. This Act made it mandatory for the state governments to seek central government's approval prior to diverting any forest land for non-forestry use. This brought down the rate of forest land diversion to only about 25,000 hectares per year between 1980 and 1995, with a further decline in the rate in recent years (GoI 1999).

That the rate of loss of forest cover has also come down is indicated by the biennial forest resource assessments carried out by the Forest Survey of India since 1987. The percentage of land under forest cover is static, at between 19% and 19.5% for the last fourteen years for which satellite data is available (see Table 1.3).

However, these figures do not reveal the true condition of forest lands as no distinction is made

between tree cover on forest and non-forest lands. It is quite likely that continuing loss of tree cover from government forests is being compensated by increasing tree cover on non-forest lands. It needs to be kept in mind that between 1985-86 and 1997-98, over 20 million hectares of plantations were raised in the country, a significant proportion of which were on non-forest lands (GoI 1999). Thus, either most of these plantations failed or the increasing tree cover due to these plantations is being offset by continuing loss from forest lands. The true picture can only emerge when the Forest Survey of India provides the breakdown of tree cover on forest and non-forest lands. It is high time that such an exercise is undertaken.

**Table 1.3 Forest cover estimates by the Forest Survey of India (1987-1999)**

Year	Forest cover as a percentage of geographical area
1987	19.49
1989	19.43
1991	19.45
1993	19.45
1995	19.43
1997	19.27
1999	19.39

Source: FSI 1999

Forest degradation is another cause for concern. Under the current classification system of the Forest Survey of India, all forests having a canopy cover over 40% are classified as dense forests. Thus, under this system of classification the density of a forest can reduce from near 100% to 40% without this being reflected in government statistics. Further, there is loss of biodiversity, environmental services, ecological value, etc. There is also intense pressure on forests for subsistence products such as fuelwood, grazing, shifting cultivation, forest fires etc. According to the Forest Survey of India Report of 1995, 53% of the forest area in the country is affected by fire, 78% is overgrazed and 74% suffers from inadequate regeneration (GoI 1998a). As explained in subsequent sections, numerous attempts are being made – both by the government and the private sector – to address the issues of degradation, low production and low productivity.

### 1.2.3 Key players

A range of players – both government and private – are involved in the forestry sector of the country. The roles of the key players are discussed in this section; further details are given in Annex 1.

#### Government

Government is by far the most dominant player in the forestry sector in India. About 97% of all forests are directly owned and managed by the government

agencies (ICFRE 1996). It closely regulates the remaining forests and plays a significant role in afforestation efforts on non-forest lands.

Since 1976, forests have been on the ‘concurrent list’ of the Constitution of India, meaning that the central as well as state governments have the power to legislate on forestry-related matters.

At the central level, the Ministry of Environment and Forests (MoEF) is the nodal agency for policy formulation, planning, promotion and coordination of forestry development programmes. Apart from setting the broad policy framework (e.g. National Forest Policy and JFM circular), the MoEF directly influences the state FDs’ operations by offering a number of centrally sponsored schemes. The MoEF often takes the lead in introducing new ideas. A good example is the issuance of the JFM circular and creation of a JFM Cell by the MoEF.

The day to day management of forests and implementation of policies is, however, the responsibility of the state FDs, which are under the respective state governments. The FDs are hierarchically organised and spend a considerable portion of their energy and resources in policing the forest lands. The FDs have a strong field presence, even in remote areas. In recent years, many FDs have tried new models of forest management that stress multiple forest values and multiple stakeholders.



## **Forest-based industries**

The forest-based industries – which produce a wide range of products such as sawn wood, veneer, plywood, pulp, paper, safety matches, sports goods, musical instruments, etc. – have traditionally been in the private sector. While some government owned enterprises were started after independence, the bulk of the processing of forest products is carried out in the private sector. More than 90% of India’s wood-based products are presently manufactured in the private sector (GoI 1999).

While the actual number of units involved in wood-processing is not available, Table 1.4 presents the details of medium and large units of major wood-processing industries.

It is estimated that the total consumption of wood by the wood processing industries is in the range of 24 to 30 million m<sup>3</sup> per annum (GoI 1999). The pulp and paper industry produces paper and newsprint worth Rs. 90 billion every year and contributes Rs. 16 billion to the national exchequer through excise duty and taxes annually (Singhania 1997). The ayurvedic (herbal medicines and cosmetics) industry is another important forest-based industry. The current market size for this industry is estimated at Rs. 25 billion, and it is growing at 20% annually.

In recent years, as a consequence of reduction in supplies from government forests, several large forest-based industries have started research and

**Table 1.4 Number of units of medium and large wood-based industries**

Industry	Number of units
Sawmills <sup>1</sup>	23,000
Paper mills <sup>2</sup>	21
Newsprint	5
Rayon grade pulp	5
Paper grade pulp	1
Paper board	305
Plywood <sup>3</sup>	61
Veneer <sup>4</sup>	14
Blockboards and flushdoors	98
Particle board <sup>4</sup>	11
Fibre board <sup>4</sup>	5
Safety matches	5

Source: GoI 1999

**Notes:**

1. Total number of sawmills including smaller units (up to 3000 m<sup>3</sup> log intake per year) that constitute 98% of all sawmills.
2. The total number of paper mills including the small ones is about 380.
3. The Federation of Indian Plywood and Panel Industry estimates that there are 62 medium and large plywood units and 418 small-scale plywood units (see Annex 2 for details).
4. The total annual capacity of decorative veneer units is estimated to be 32,857,000 m<sup>2</sup>. The total annual capacity of particle board and fibre-board units is estimated to be 207,674 MT

(Source: The Federation of Indian Plywood and Panel Industry n.d.).

development efforts and have also initiated programmes for raising plantations on farm lands in partnership with the farmers (see Section 3).

### External funding agencies

Bilateral and multilateral funding agencies are important players in the forestry sector as a significant proportion of funds for forestry activities are provided by these agencies (see Section 1.2.4). Substantial external assistance to India's forestry sector started from 1979 with the implementation of the World Bank aided Social Forestry Project in Uttar Pradesh. By 31 March 1998, 15 externally assisted projects had been implemented in 14 states. In the early years, the focus was only on afforestation but since 1992, the emphasis has been on the overall development of the forestry sector. Currently, 19 externally assisted projects are under way in 13 states (GoI 1999) (see Annex 3).

The major external funding agencies in the forestry sector are the World Bank; Overseas Economic Cooperation Fund; Japan; the European Union; the Department for International Development; United Kingdom; the Swedish International Development Agency; Sweden; and GTZ, Germany. The largest

amount of funds have been received from the World Bank and the Overseas Economic Cooperation Fund, Japan.

### **Farmers**

There are 105.29 million operational holdings (1991 figure) in the country covering an area of 165.6 million hectares. Farmers in many parts of the country have traditionally grown trees along with their agriculture crops, mainly for meeting their subsistence needs. In recent years, farmers of some regions have also started plantations of tree crops, mainly for sale, and are now important producers of wood. It is estimated that 50% of wood supply in the country is currently coming from non-forest sources. The average production of timber (logs) from non-forest sources amounts to about 14 million m<sup>3</sup> per year.

In some states, non-forest areas contribute the major proportion of the total production. For instance, in Kerala almost all the wood supply comes from non-forest sources. While in 1965, 75% of all wood in Kerala came from forest sources and only 25% from non-forest sources, by 1993-94 the picture had completely changed and as much as 94.1% of wood came from non-forest sources. Home gardens contributed 83.1% of wood, estates 8.2% and imports 2.8%. In the case of industrial wood, home gardens provided 47.9%, estates 29.7%, imports 13.7% and government forests only 8.7% (GoI 1999).

Typically, farmers grow commercial tree crops on a part of their land (or on field boundaries). The rotation followed is generally under ten years. The produce (mainly timber and pulpwood) is usually sold to the local traders, who supply it to various wood-based industries.

### **Local communities<sup>6</sup>**

India is primarily a rural country with about three-fourths 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). The country also has perhaps the largest tribal population in the world, which stood at 68 million in 1991. 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 and even food and medicines in the form of Non-Timber Forest Products (NTFPs). Sale of fuelwood and NTFPs also generate vital cash income for many poor households. The dependence is greatest among the poor. In 1991, the poor officially totalled 253 million, or 30% of the population. Nearly four out of five poor live in rural areas (GoI 1999; Tata Services 1992, in WRI *et al* 1994). In 1981, one in nine rural households did not own any land (Hague 1987, in Mishra 1997).

Over two-thirds (68%) of the total cultivated area in India is rainfed (Katyal 1993, in WRI *et al* 1994; Singh 1988, in WRI *et al* 1994). As the bulk of rainfall

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6. Adapted from Saigal 1995; Saigal 1998



is received in just three months of the southwest monsoon, only a single crop is possible in most rainfed areas. The single crop is rarely enough to see most farmers through the year and they have to search for wage labour opportunities in irrigated agriculture fields or in the towns. Since wage labour is also often scarce, many have to depend on forests and village common lands for survival.

According to India's submission at the Rio conference in 1992, 70% of rural and 50% of urban people use fuelwood for cooking purposes (World Bank 1993; Dwivedi 1993). Rural communities depend heavily on forests for small timber for house construction, bullock carts, agriculture implements and so on. There are estimated 13 million bullock carts in the country, which require considerable timber for construction and maintenance. Most houses in rural areas are still constructed from timber, bamboo and grass. It is estimated that consumption of bamboo alone for this purpose is around 1.6 million metric tonnes (MT) per annum (GoI 1984). India also has the world's largest livestock population out of which about 25%, i.e. over 100 million, graze on forest lands that have an estimated capacity to support only 31 million (The World Conservation Union 1991, in WRI *et al* 1994; Dwivedi 1993).

Forest-based activities are often an important source of cash income for the poor, especially in the lean season. A survey of 170 households in nine villages in Bihar showed that fuelwood sale served as a major source of income for 20% of the households (World Bank 1993). In some areas, so many people are engaged in this activity that fuelwood is regularly carried in local trains for sale in the towns. NTFP collection and processing is another source of cash income. Millions of people are engaged in collecting *tendu* (*Diospyros melanoxylon*) leaves for country-cigarette (*bidi*) rolling. In Saharanpur District of Uttar Pradesh, an estimated 200,000 people derive a major part of their livelihood from *bhabbar* grass (*Eulaliopsis binata*) harvesting and processing (Poffenberger and Sarin 1995). A survey carried out in nine villages in West Bengal showed that 72% of the households were engaged in stitching leaf plates from *sal* (*Shorea robusta*) leaves. This activity alone generated nearly half the households' income (Dutta and Adhikari 1991). A study conducted in seven villages spread over four districts in Orissa revealed that as many as 91% of men and 98% of women were engaged in NTFP collection from forest areas. For many, especially women, NTFP collection was found to be the primary occupation. Households having an annual income of less than Rs. 3,000 derived 50% of their earnings from NTFPs, whereas those earning over Rs. 6,000 derived 21% from NTFPs (Malik 1994).

Local communities, especially the poor and the tribals, are important stakeholders in the forests by virtue of their acute dependence on forest produce. In the past decade or so local communities have also emerged as an important protector and manager of forests through the JFM programme. As stated earlier, it is estimated that around 63,000 community groups are protecting and regenerating more than 14 million hectares of government forest lands under JFM (see Section 2.1.1).

## 1.2.4 Investment in the forestry sector<sup>7</sup>

Investment in the forestry sector is very low. While forest produce worth Rs. 300 billion is extracted annually from the government forests alone, the total investment (government and private) is under 15% of that or Rs. 41.7 billion.

The forestry sector does not appear to be high on the government's funding priority list. The outlay for forestry in the Five-Year Plans has mostly been under 1% of the total outlay despite the fact that forests are now recognised as being so critical for people's livelihoods and environmental security. The ratio of forestry budget to Gross Domestic Product has declined over the past decade.

The available figures indicate that 64% of the investment in the forestry sector is made by the private sector.<sup>8</sup> External funding agencies provide around 20% while the government's share is about 16%.

Given the fiscal difficulties of the central and state governments, it seems likely that government expenditure will increase substantially in the near future. Even if it does increase somewhat, a significant proportion of it is likely to be revenue expenditure, which would be needed just to maintain capital assets and staff positions. External funding, while currently important, cannot be viewed as a long-term and sustainable source of funding of forestry development.

Thus, there is a need to generate additional resources outside the government system. Attention is turning to the ways in which the private sector, which is already investing a significant amount, could play an even greater role in the future.

## 1.2.5 Demand and supply of forest products<sup>9</sup>

There is a huge gap between the demand and sustainable supply of various forest products. This section discusses the demand and supply situation with respect to major forest products and the role of the informal sector.

Fuelwood is by far the most important product extracted from India's forests. Of the total demand for wood in the country, it is estimated that over 80% of the demand is just for fuelwood. Though estimates for its demand vary, most of the studies place it between 210-233 million tonnes for the year 2001 assuming an annual growth rate in demand as being equivalent to that of population growth. The annual allowable cut of fuelwood from government forests is about 44 million tonnes and from private forests it is about 35 million tonnes. Thus, the total *sustainable* cut of fuelwood is 79 million tonnes, leaving a gap of some 131-154 million tonnes. It is obvious that people are meeting their demand for fuelwood somehow, and as such there is no gap. However, this demand is being met from unsustainable removals from forests and plantations and most likely also through unrecorded farm forestry and common land sources.

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7. See Annex 3 for details.

8. Assuming current investment level to be same as that for 1993-94, for which estimates are available.

9. See Annex 4 for details.



Photo: Sushil Satgai

**Workers at a pulpwood storage yard. It is thought that raw material supply will have to increase substantially to meet projected demand for newsprint and paper in the coming decade**

Industrial wood, which includes all wood other than fuelwood, though comprising a small part of the total demand, is also in short supply. Estimates put the overall demand as ranging between 50 and 65 million m<sup>3</sup> for the year 1996. Against this, the annual allowable cut is estimated to be only 26-27 million m<sup>3</sup>, resulting in a shortfall or unsustainable removal of between 23 and 38 million m<sup>3</sup>.

Within the industrial sector, the paper and pulp mills account for a sizeable portion of the total demand for wood. According to some estimates, the total demand for pulpwood was around 8 million m<sup>3</sup> in 1998 while the supply was only 3.3 million m<sup>3</sup> resulting in a gap of around 4.7 million m<sup>3</sup>. Demand is likely to go up to 14.3 million m<sup>3</sup> in 2005 while supplies will only increase to about 5.4 million m<sup>3</sup>, leaving a gap of 8.9 million m<sup>3</sup>.

Bamboo is another important forest product that has a large number of uses. It is used not only by large industries but also by artisans and households. It is estimated that the total bamboo production in the country was around 3.8 million tonnes in 1995-96. Against this, the potential availability of bamboo in India (depending on the annual allowable removal from the stands) is approximately 4.6 million tonnes. Thus, the removals presently are lower than the sustainable harvest levels.<sup>10</sup> However, this does not include the unofficial removals from the forest areas. Demand for bamboo is likely to go up in the future. It is estimated that consumption of bamboo for the year 2010 will be around 11.4 million tonnes resulting in a gap of 6.9 million tonnes. Even if we

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10. This is most probably due to the felling bans imposed by some states.

consider that one-fourth of this gap will be supplemented by the yield of bamboo from bamboo plantations created in the last 10 years, there will still be a gap of 5.2 million tonnes in the year 2010.

Despite the disparity in estimates, this analysis of available demand and supply information, and projections into the future indicate that whether for fuelwood or for industrial wood, gaps currently exist between demand and *sustainable* supply and are likely to increase.<sup>11</sup>

Another important factor that needs to be taken into account while calculating demand and supply is the role of the 'informal sector'.<sup>12</sup> A study of the small-scale informal forestry sector, undertaken in two districts (Yamuna Nagar in Haryana and Rajkot in Gujarat<sup>13</sup>) revealed that a significant proportion of wood-based enterprises are the informal sector and as such their contribution to demand and supply of forest products may not be properly reflected in the official statistics. It was found that about 27% of the total forest-based enterprises in Yamuna Nagar and as many as 98% in Rajkot were operating informally. The study found that while very few (less than 5%), of units manufacturing products such as veneer and plywood were informal, most (92.5%) of the units engaged in manufacturing truck and bus bodies were operating informally. Around 38% of units manufacturing items such as packing boxes, furniture and fixtures, cable drums, agricultural implements etc. were also found to be informal. Another activity where significant number of informal units exist is saw-milling. As many as 44% of the sawmills in Yamuna Nagar and 92% in Rajkot were found to be operating informally.



In Yamuna Nagar, around 7% of the total raw material used (in value terms) in the district was consumed by the informal sector. In Rajkot, this figure was around 93%. The informal sector spent around Rs. 191 million on raw material procurement in Yamuna Nagar, and Rs. 119 million in Rajkot.

Clearly, the informal sector has an important place in the forestry sector. Any calculation of demand and supply sector would be incomplete without including the informal sector. At present, nationwide assessments of demand from the informal sector are not available.

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11. However, it must be borne in mind that most of these estimates are based on assumptions which may no longer be valid following the introduction of radical changes in the forest policy of 1988 and liberalisation of the economy in 1991.

12. The 'informal sector' includes units that are not registered under the Factories Act 1948.

13. While Yamuna Nagar is a major industrial centre and a wood trading centre, Rajkot is less developed with respect to wood-based industries.

# Policy for private sector participation

Sustainable management of forests requires that a balance be achieved among the social, economic and environmental services that this resource provides. Policies that determine or influence the nature of this balance vary according to national and sub-national priorities at any given time. During colonial rule in India, economic exploitation of forests was of primary importance.<sup>1</sup> After independence in 1947, forests retained their commercial importance although certain social and environmental priorities were also recognised. In the contemporary policy context, there is a marked shift away from production forestry, and forest conservation and meeting the subsistence needs of local communities are emphasised as national priorities.

The national agenda for forest management, as enunciated in the National Forest Policy of 1988, the 'National Conservation Strategy and Policy Statement on Environment and Development', 1992 and the IX Five-Year Plan (1997-2002) identifies individuals, local communities and industry as the intended partners in forest management. However, the form and extent of participation of these stakeholders also depends on a number of factors, including other national and state level policies and laws, market conditions, institutional and infrastructure facilities as well as cultural and social norms.

This section examines the various national and state level policy measures and instruments that shape private sector participation in sustainable forest management. The private sector here comprises individuals, local communities and biomass-based industry (which includes the wood-based industry, ayurvedic industry and plantation companies). The scope of participation of these entities varies according to their status as owners, managers or users of forest resources. Correspondingly, the policies affecting the participation of the private sector in government forests (as managers and users), in private forests (as owners, managers and users) and in industrial processing (as users) are separately examined.

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1. In the early British period, the main objectives of the colonialists were to obtain timber for ship building, local construction, sandalwood export and to encourage conversion of forest lands into agricultural revenue-paying lands (Lal 1992; Hopley 1996). As early as 1806, a police officer was appointed as Conservator of Forests in Travancore and Malabar, who started large-scale felling to obtain timber for the Royal Navy (Lal 1992). However, in the later British period, stress was also laid on meeting people's needs. A forest policy was announced in 1894 which placed great emphasis on the management of forests for the overall public benefit. It also stressed the importance of meeting local needs.



## 2.1 Government forests

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 the change in land use and transfer of ownership. Two new clauses added to the Act in 1988 (Sub-clause 2 (iii) and (iv)) have severely restricted the role of the private sector on government forest lands.

- According to Sub-clause 2 (iii) of the Forest (Conservation) Act, 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/ organisation not wholly owned, managed and controlled by the government, without the prior approval of the central government.<sup>2</sup>
- 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. These provisions virtually preclude transfer of ownership to or lease of government forest land by the private sector.<sup>3</sup>



The system of forest leases for harvest of timber and bamboo as per Working Plan prescriptions to industry or forest contractors has also been abolished. Logging operations are carried out either by the State FDs or Forest Development Corporations (FDCs) and the private sector has no role to play even in the development of scientific logging operations.

Thus, the government holds ownership rights of government forests, and it is not possible for these rights to be transferred to individuals, local communities or to 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 (subject to carrying capacity) and also envisage their involvement in management. On the other hand, while industry is treated as a legitimate user, it is not eligible for a role in

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2. However, the Governments of Orissa and Arunachal Pradesh have entered into agreements with industry for use of forest land on terms that are deemed to contravene the Forest (Conservation) Act 1980 (Planning Commission 1998).

3. Leasing of forest land to industry has been a long standing debate (see Section 3.2) and was the subject of a working group set up in 1997 by the Planning Commission. The report of the working group deals primarily with the demand of the paper industry to raise captive plantations on government forest land to meet its raw material requirements. The working group recommended against leasing of land, as it was against the Forest (Conservation) Act, the National Forest Policy, and on social, ecological and economic grounds (Planning Commission 1998). Instead, the Planning Commission recommended concerted attention be given to developing farm forestry and various company-grower arrangements to generate the raw material to meet India's pulp and wood needs. These recommendations have been cited in the IX Five-Year Plan document.

management. Hence, within the private sector, local communities alone are currently treated as stakeholders in managing government forests.

In line with the National Forest Policy, there has been a strategic move to enlist local support for forest protection and to inculcate controlled utilisation by communities living in and around government forests. As a result, JFM has been introduced in most states and participatory 'ecodevelopment' projects are being implemented in selected protected areas.

### 2.1.1 Joint forest management

In the past, FDs in states such as West Bengal, Arunachal Pradesh, Orissa and Gujarat explored different ways of working with local communities to manage government forests. Building on this experience, national guidelines for JFM were formulated in 1990 and revised in the year 2000. The concept of JFM envisages the involvement of village communities in the protection and/ or regeneration of government forests. As an incentive, communities are entitled to certain usufruct rights, a share in the harvest income and a role in management. According to latest official statistics, JFM is being implemented by 27 state governments and over 63,000 JFM groups are engaged in protecting and managing nearly 14 million hectares of forest lands (see Table 2.1).

The national guidelines issued by MoEF provide the framework for JFM. However, the precise terms on which communities work with FDs are determined by policy measures introduced by state governments. Four elements are critical to the quality of community participation on a sustained basis. First, communities are more likely to make long term commitments to JFM if the programme and local groups (or JFM committees) have legal standing. Second, assured usufruct rights are likely to act as a powerful incentive. Third, an attractive share in income on harvest would encourage continued participation for protection. Fourth, local control over decision making would increase the opportunities for effective participation.

The national guidelines on JFM support local participation only on the second count, i.e. assuring usufruct to the communities engaged in JFM. The national guidelines are non-prescriptive on the other three elements, and leave it up to the state governments to decide. Most of the states do not give any legal backing to JFM, they give a relatively small share from timber harvests to the communities, no share in scheduled NTFPs<sup>4</sup> and little control over decision making. Community participation in JFM can be greatly enhanced if policy changes address the above-mentioned lacunae.<sup>5</sup>

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4. Scheduled NTFPs are those NTFPs in which the government enjoys monopoly rights of trade. While in most states JFM committees are not given any share in income from scheduled NTFPs, Andhra Pradesh has recently decided to share 50% of profit from a major scheduled NTFP (*tendu* leaves) with the JFM committees.

5. Although it is recognised that policies generally lay down the intention of the government and may often remain unimplemented, nevertheless, it is important that at least the policy lacunae are filled so that when the policies are implemented they are able to meet the desired goals more effectively.

<b>State</b>	<b>No. of JFM committees</b>	<b>Area under JFM (hectares)</b>
Andhra Pradesh	7,606	16,79,084.00
Arunachal Pradesh	13	5,810.00
Assam	245	6,970.00
Bihar	296	74,139.50
Chattisgarh	6,412	33,91,305.31
Goa	26	13,000.00
Gujarat	1,237	1,38,015.19
Haryana	471	65,852.42
Himachal Pradesh	914	1,11,247.20
Jammu & Kashmir	1,895	79,546.00
Jharkhand	1,379	4,30,463.00
Karnataka	2,620	1,85,000.00
Kerala	32	4,994.70
Madhya Pradesh	9,203	41,25,837.00
Maharashtra	2,153	6,86,688.00
Manipur	58	10,500.00
Mizoram	129	12,740.00
Nagaland	55	1,50,000.00
Orissa	12,317	7,83,467.00
Punjab	188	97,193.40
Rajasthan	3,042	3,09,336.00
Sikkim	158	600.00
Tamil Nadu	999	3,73,389.00
Tripura	160	23,476.79
Uttar Pradesh	502	45,025.44
Uttranchal	7,435	6,06,608.00
West Bengal	3,545	4,88,095.00
<b>Total</b>	<b>63,090</b>	<b>1,38,98,382.95</b>

Source: Ministry of Environment and Forests 2001 (Unpublished data)

### 2.1.2 Ecodevelopment

Protected areas are the second arena in which local communities are sought to be involved. The protected area network consists of 84 national parks and 447 wildlife sanctuaries, spanning about 15 million hectares. In 1991-92 the Government of India (GoI) launched an eco-development scheme around selected protected areas, mainly tiger reserves. In 1996, the India Ecodevelopment Project was started around seven protected areas with the assistance of the World Bank. This US\$ 67 million project is being implemented in the following protected areas: Palamau in Bihar, Buxa in West Bengal, Nagarhole in Karnataka, Periyar in Kerala, Pench in Madhya Pradesh, Gir in Gujarat and Ranthambhore in Rajasthan.

Under eco-development, the aim is to provide improved subsistence strategies to the local people through improving productivity and utilisation of their lands and other resources and enhancing their income. The hope is that this would



help in reducing the dependence of these communities on the protected areas. However, the progress of ecodevelopment, especially under the India Ecodevelopment Project, has been far from satisfactory. In the first half of the five year project only about Rs. 200 million could be utilised out of the total sanctioned amount of Rs. 3 billion. During the same period only 100 ecodevelopment committees and 37 FPCs could be constituted as against the total project target of 2000. The number of approved microplans during the period was only 17 (WWF 1999).

It also needs to be borne in mind that, unlike JFM, the objective of ecodevelopment is not the involvement of the fringe communities in the management of protected areas but is limited to enlisting their cooperation for conservation of protected areas through provision of certain economic incentives.

The current law governing protected areas, the Wildlife (Protection) Act, 1972, does not offer much space for local communities' participation in the management of protected areas. Although efforts are underway to amend it and introduce new categories of protected areas such as 'community reserves',<sup>6</sup> the proposed amendments do not tackle the issue of involving the village communities in the protection and management of existing protected areas. The process of declaring an area as protected is still arbitrary and there is a need for greater transparency and participation in settling of rights (Pathak and Kothari 1998).

## 2.2 Private forests and forestry on non-forest lands



### 2.2.1 Private forests

About 3 per cent of the forest lands of the country are designated as private forests. The use and management of these forest lands 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, there are two areas of concern regarding the involvement of the private sector in the management of these forests. These relate to the restrictions placed on the owner regarding the transfer of private forest land and the use of private forests (see Annex 5). The states of Andhra Pradesh, Kerala, Tamil Nadu and Orissa restrict the transfer of these lands. This means that the land owner has to obtain permission, often from the District Collector, in order to sell, mortgage, lease or otherwise alienate the whole or any portion of forest land (or forest produce). Laws dealing with private forests in other states do not mention the issue of land transfer. Instead, the owner must obtain permission in order to cut or girdle trees, or do any act likely to denude a forest or diminish its utility as a forest.<sup>7</sup> This provision clearly aims to prevent clearfelling and conversion to agriculture, but in order to do so it regulates the removal of forest produce, particularly timber.

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6. A draft amendment to this law seeks to introduce two new categories of protected areas: 'conservation reserves' to provide buffers or corridors to existing protected areas, and 'community reserves' declared on the recommendation of a community or individuals seeking legal sanction and recognition to areas that they wish to protect. In both cases, local communities are to be represented on advisory committees for management.

7. Permission is not required for using forest produce for customary or domestic needs.

Additionally, the regulations provide that if government perceives that the land owner is not taking adequate care of his/ her forest, it has the power to assume management through a process of notification. Such forest is variously termed ‘private protected forest’ (in Bihar), ‘controlled forest’ (in Himachal Pradesh) and ‘vested forest’ (in Uttar Pradesh and West Bengal). Further, under Section 35 of the Indian Forest Act, 1927,<sup>8</sup> the state government may regulate or prohibit cultivation, pasturing and clearing of vegetation in private forests through notification issued after a process of dealing with any objections that the landowner may have.

Evidently, these measures undermine the tenurial 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. Similarly, regulating removal of forest produce by owners of private forest is also a serious disincentive.

### 2.2.2 Forestry on non-forest lands

Other than in forest areas (state or private), plantations can also be taken up on non-forest lands.<sup>9</sup> The National Forest Policy envisages a major role for the private sector in planting on these lands (see Table 2.2). However, numerous

**Table 2.2 National Forest Policy: provisions for private plantation**

Entity	Role
<b>Individuals</b>	<p>People should undertake tree farming and grow fodder plants, grasses and legumes on their own land; this should be facilitated by modification of land laws; degraded land may be made available on lease/ tree <i>patta</i> basis,<sup>10</sup> subject to land grant rules and land ceiling laws; felling of trees on private land should be suitably regulated (Paragraph 4.2.4).</p> <p>Farmers may be encouraged to grow wood species required for industries. These may also be grown along with fuel and fodder species on community lands not required for pasture purposes (Paragraph 4.9).</p>
<b>Communities</b>	<p>Communities should be responsible for the maintenance of tree crops and fodder resources on village and community land with technical assistance and other inputs to be provided by government; certain tree ownership rights may be vested in individuals; communities are entitled to usufruct rights; revenue is to be shared with community (and <i>panchayat</i> if land is vested in it) (Paragraph 4.2.3).<sup>11</sup></p>
<b>Industry</b>	<p>Forest-based industries should raise their own raw material, preferably in association with individual farmers, by supporting them with inputs including credit, technical advice, and harvesting and transport services (Paragraph 4.9).</p>

Source: Gol 1988

8. This section relates to the protection of private forests (and wasteland) for special purposes. These include protection against soil erosion and landslips; maintenance of water supply in springs, rivers and tanks; protection of communication lines; and the preservation of public health.

9. Non-forest land essentially consists of private land, and public land owned either by *panchayats* or the revenue department.

10. Tree *patta* refers to the granting of right over the produce from the trees.

11. *Panchayat* is the lowest unit of local self government.

state level forest laws and rules that regulate user rights of the land and its produce, act as major disincentives for the involvement of the private sector. In addition, there are other factors that govern the decision to invest in plantations, which are influenced by a range of national and state level policies that are outside the purview of the forestry sector. These are briefly presented in Table 2.3 and detailed in Annex 6.

## 2.3 Industrial processing

Biomass-based industries add value to forest produce and provide economic incentives to both state and private forestry. In the interest of sustainability, industry must use raw material in a conservative and efficient manner. This provides the necessary link between meeting economic and ecological objectives of forest management.

The current status of forest-based industry is influenced by the larger context of industrial policy. Economic and policy reforms have drastically reduced industrial licensing requirements, removed restrictions on investment and expansion, and facilitated easy access to foreign technology and foreign direct investment. This section examines these measures in relation to biomass-based industries.

While numerous measures that once protected industry have been removed since 1991, some of these remain, notably in the case of small-scale industries. A total of 821 items are reserved for the small-scale sector. Reserved items include sawn timber, wooden crates, tea chest plywood, seasoned wood, wooden furniture and fixtures, miscellaneous paper products, sandalwood oil, pine oil, resin, safety matches, pencils and brushes.<sup>12</sup> Small-scale industries are provided certain special treatment such as priority sector lending and concessional credit, preferential purchase by central and state government organisations (358 items), assistance for technology development and modernisation, incentives for ISO 9000 certification, and excise exemptions (except sandalwood oil and matches) (MoI 1999). So far, wood processing industries and NTFP-based industries in the small-scale sector have been given preferential state support. While this policy protects the small-scale sector against competition, it does not actively promote efficient utilisation of resources such as wood, which is also a national priority. The existing arrangement also limits the possibilities of investment and technological upgrading in the industrial forestry sector.

Licensing is now required by only seven types of industries. This list no longer includes the paper and pulp industry as was the case until recently. Industries are free to select project location as long as they are at least 25 km from standard urban limits. This restriction does not apply to small-scale industries. Siting of industries is, however, subject to environmental considerations, as

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12. Large units may also manufacture these items if they obtain an industrial licence and undertake an obligation to export 50 per cent of their produce.

Table 2.3 Policies affecting private plantations

Pre-requisites for plantation development	Policies
Secure rights of use	Various state laws restrict the right of land owners to remove, transport and sell forest produce. These act against the interest of the producers and bring in an element of uncertainty in the operation of sale transactions (Saxena and Ballabh 1995) and discourage tree farming.
Availability of land	Land ceiling <sup>13</sup> laws apply to tree plantations. Permissible agricultural holdings are very small which restrict the corporate sector from playing any meaningful role in private sector forestry development, <sup>14</sup> or for raising any 'captive' industrial plantations <sup>15</sup> for meeting raw material requirements for the wood-based industries.
Technical development	Legislation for <i>sui generis</i> protection for breeder's rights is still pending, and there is no mechanism for certification of seed of forestry species or registration of clones. There is, therefore, very little incentive for private sector investments in forestry research. Recent introduction of Protection of Plant Varieties and Farmers' Rights Act (2001) may address this issue to a certain extent but how much will depend on how effectively this legislation is implemented.
Access to institutional finance	The National Bank for Agriculture and Rural Development (NABARD) provides banks with refinance through a number of forestry schemes.
Favourable trade policies and remunerative prices of forest produce	The import of wood, wood products and pulp is now virtually unregulated. Wood-based raw material and intermediate products respectively attract the lowest and middle order of import duties. The export of wood and unfinished wood products is prohibited on grounds of national scarcity. Low import duties and the ban on exports together work to depress domestic prices. On one hand, this adversely affects the profitability of domestic wood producers; on the other hand, wood-based industries have little incentive to improve wood conversion ratios and overall efficiency and competitiveness. Relatively high import duties on finished goods reinforce this situation.

In contrast, a number of NTFPs are still under state trading regimes, and many others require import licences. Import duties are pegged at the highest level possible for non-wood raw material and finished goods. Regulation of imports accompanied by high duty structure insulates the domestic market. Since state owned bodies hold a monopoly in procurement and trade in commercial NTFPs, they are the primary beneficiaries of protectionist trade policies. While this allows the government to fully control prices to its own advantage (which may or may not benefit collectors) it has the dual effect of discouraging production in the private sector and restraining growth of the NTFPs-based industry.

Laws in several states establish the states monopoly in trade of certain timber and non-timber products. The degree of regulation varies across states. The most extreme is in Himachal Pradesh, where the government is the sole authority to purchase all forest produce. Trade in sandalwood and *tendu* leaves is nationalised in all states that grow them. A system of licences is in place for the extraction of *katha* (*Acacia catechu*) in a number of states. Uttar Pradesh has a separate law dealing with control over resin extraction and trade. States often hold a monopoly in major timber species (normally excluding farm forestry ones)<sup>16</sup> and virtually all important NTFPs. A private grower is thus obliged to supply NTFPs only to government approved agencies and is paid a collection charge rather than a competitive price for his/ her produce. This acts as a major disincentive for private production.

Source: Gol 1988

13. Land ceilings are one of the elements of land reforms that seem to alleviate poverty and lead to growth with distributional equity. In 1972, the central government set out land ceiling guidelines for state governments. Accordingly, for a five member family, holdings of the best category of land in a state, with assured irrigation and capable of yielding at least two crops a year should be limited to 10-18 acres; holdings with assured irrigation for a single crop a year should be limited to 27 acres; and all other types of land should be limited to 54 acres (different states have adopted different ceiling limit). In the case of owners with holdings consisting of different types of land, the total holdings after converting better categories into the lowest categories should not exceed 54 acres (IASSI 1991). [1 acre = 0.404686 hectare]

14. For example, an agricultural land holding by a company or an individual in Andhra Pradesh cannot exceed one standard holding equivalent to 4.05 hectares irrigated land of category (a) or a maximum of 21.85 hectares of un-irrigated land of worst category (k). (Reddy and Reddy 1995, in Lal 1999).

15. Captive plantations refer to plantations raised by any industry to meet its own raw material needs.

16. In Bihar, eucalyptus grown on private holdings was exempted from state marketing as late as 1990 (vide notification S.O. 628 dated 10 September 1990).



Photo: Sushil Saigal

Two rows of poplars planted on field bund by neighbouring farmers. Poorer farmers with small landholdings can only plant on field edges rather than in blocks

specified in 56 protected districts and 27 districts reserved for non-polluting industries (excluding the paper and pulp industry). Many of these locations are in forest areas and could thus be out of bounds for any industry including the forest-based industry. In addition, environmental clearance from the MoEF is required for a list of 29 industries (including paper, pulp and newsprint) having an investment exceeding Rs. 500 million. All industries are subject to local zoning and land use regulations.

The paper, pulp and paper products industry is subject to other environmental regulations as well. It is one of the twenty-nine industries subject to regulations for using hazardous processes. Industry specific standards are prescribed for emissions, effluents, and discharge of wastewater by both small and large paper and pulp industries. Small-scale industries are allowed simplified consent procedures under the Air (Prevention and Control of Pollution) Act 1981, and the Water (Prevention and Control of Pollution) Act 1974 (Shrivastava 1999).

The central government has taken measures to facilitate foreign direct investment and investment from non-resident Indians including overseas corporate bodies. Sector specific guidelines for 22 sectors do not, however, list biomass-based industries separately. Foreign direct investment and that by non-resident Indians including overseas corporate bodies is not permitted in the plantation industry. Foreign equity up to 24% is permitted in small-scale industries, subject to licensing and government approval. Manufacture of wood and wood products, furniture and fixtures is included in the 22 industries in the consumer goods sector in which dividend balancing is applicable; and hence investment and returns are not freely repatriable (SIA 2000).<sup>17</sup>

## 2.4 Summary of the policy environment

Recent years have seen numerous policy changes, both at the central and state levels, that have influenced the participation of the private sector in forest management. While the involvement of the corporate private sector as well as individuals in management of government forests has been almost totally eliminated, community involvement in their management has been greatly encouraged through the JFM programme.



### Box 2.1 Role of private sector in government forests – the policy position

- Private sector (whether individual, community or industry) cannot own/lease government forests.
- Although industry and individuals use produce from the government forests, they do not have any role in its management.
- Only local communities are currently treated as stakeholders in managing state forests.

However, there is a need to take measures to strengthen community participation in JFM. Though most states have created a policy environment that is conducive for eliciting effective participation of communities, many states need to provide a legal backing to the JFM resolution; and almost all the states need to increase the share of income of the community in the harvested produce and give more powers to the local committees to participate more effectively in the decision making process.

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17. Under the dividend balancing condition, for companies in specific sectors with foreign equity holding, repatriation of foreign exchange in the form of dividends was linked to export earnings. This condition, which was imposed in order to prevent foreign exchange outflow from the country, was removed in 2000.

The National Forest Policy of 1988 envisages a major role for the private sector in planting on non-forest lands. However, numerous state level forest laws and rules that regulate user rights of the land and its produce act as major

disincentives for the involvement of the private sector. Further, since the requisite land, resources, and market support for plantation lie outside the purview of the forestry sector, the National Forest Policy is by itself largely ineffectual in this regard. Though many policies outside the forestry sector encourage the involvement of the private sector, reforms are needed to improve availability of land for undertaking plantations, secure ownership and use rights to the produce grown on private lands, ensure remunerative prices for the farm produce, encourage technological innovation, improve credit availability for plantations and support industrial growth.

#### Box 2.2 Factors affecting community participation in JFM

- Legal standing of JFM/ JFM committees.
- Use of usufruct rights given to JFM committees.
- Share in income of the committees.
- Decision making powers of the committees.

#### Box 2.3 Private forests: some management concerns

- Government reserves the right to regulate/ prohibit cultivation, pasturing and clearing of vegetation.
- In some states, transfer of these lands cannot be done freely.
- In most states the owner needs permission to fell trees.
- In some states the government can assume the management of these forests.

The new industrial policy has forced private sector industries, including those based on wood, to restructure themselves in order to maintain profitability; though many units have failed to do so. The transition has been particularly difficult for the wood-based industry, which also had to adjust to withdrawal of committed supply of raw material at subsidised prices from government forests. Among these, the paper and pulp industry must also contend with strict environmental regulations. Although favoured by liberalised raw material imports and high duties on finished goods, many of these industries are short of capital and use obsolete technology. These conditions threaten the sustainability of wood-based industry, which in turn may trigger increased pressure on scarce forest resources or else greater dependence on imports.



# Role of the corporate private sector

As mentioned in Section 2, the provisions of the Forest (Conservation) Act, 1980 and the National Forest Policy, 1988 have effectively ended the direct role of the corporate private sector on government forest lands.<sup>1</sup> In earlier years, many large companies were either given forest lands on lease or were allotted forest areas for logging to meet their raw material requirements. The National Forest Policy, however, specifically prohibits this (see Box 3.1). This places the forest-based industry in India in a peculiar situation as 90% of the wood-based products in the country are manufactured in the private sector while 97% of the forest area is owned and managed by the government (ICFRE 1996; GoI 1999).

The role that the corporate private sector can play outside government forest areas is also severely restricted as it is unable to raise large-scale plantations on non-forest lands on account of statutory land ceilings on agricultural land. The ceiling limits vary from state to state and also for different categories of land.

## Box 3.1 National Forest Policy on industry

"Natural forests serve as a gene pool resource and help to maintain ecological balance. Such forests will not, therefore, be made available to industries for undertaking plantation or any other activity... The practice of supply of forest produce to industry at concessional prices should cease. Industry should be encouraged to use alternative raw materials. Import of wood and wood products should be liberalised" (GoI 1988).

However, the ceiling limits on agricultural land holdings for corporate entities are the same as those for individuals. Thus, a company can own and manage only as much agricultural land as is permitted under law for any individual and this is insufficient to raise captive plantations on any meaningful scale.<sup>2</sup>

The National Forest Policy does not envisage a role for the corporate private sector in forestry research and development work. Forestry research in India has been the sole preserve of the FDs and government research institutes. In recent years, some universities have started research on topics such as agroforestry. There are no incentives for the companies to get involved in research and development. Legislation for *sui generis* protection of breeder's rights is still

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1. However, some companies are continuing to operate on forest lands, especially for extraction purposes, by becoming agents of the state owned forest corporations. For example, Ballarpur Industries Sewa Unit is currently extracting 25,000 tonnes of bamboo per annum from government forests in Malkangiri District of Orissa by entering into an agreement with the state owned Orissa FDC. Several other companies including JK Corp., Orissa and Ballarpur Industries, Ballarshah, Maharashtra are also operating on forest lands in this manner.

2. As mentioned earlier, according to national guidelines of 1972, the maximum ceiling limit for the best category of land should be 10-18 acres while that for the worst category should be 54 acres (IASSI 1991). [1 acre = 0.404686 hectare].



pending, and there is no mechanism for certification of seeds of forestry species or registration of clones.<sup>3</sup>

Clearly, there is very limited scope for the corporate private sector's direct involvement both on government forest lands and on non-forest lands. However, forest policy changes as well as trade policy changes (see Box 3.2) have led to the realisation among companies that the days of subsidised raw material supplies and protected markets are over and that they have to constantly innovate in order to survive in the evolving highly competitive environment.<sup>4</sup>

### Box 3.2 Trade policy changes and forest-based industry

Until the mid 1980s, the domestic market for most goods was closely protected by import restrictions and administered prices. Liberalisation of trade intensified rapidly after the launch of the economic reforms programme in 1991 and India's ratification of the World Trade Organisation (WTO) agreement in 1994. Trade policy reforms have progressively simplified India's restrictive import licensing and reduced tariff protection.

The basic duty on all other items has been reduced substantially (see Annex 7). Along with the other sectors of the economy, this has also affected wood-based industries, who have started facing increasing competition from overseas. Such competition has resulted in a greater stress on overall efficiency in the industry, including in raw material procurement and use.



It is against this background that several companies have encouraged tree planting by farmers in recent years and also entered into different types of partnerships with them.<sup>5</sup> Some companies have also invested significantly in research and development for improving the productivity of plantations. Many are currently engaged in the development of improved higher-yielding clones. In fact, during a very short period, these companies have emerged as the most important innovators and promoters of intensification of production in the forestry sector.

The companies have, however, simultaneously kept up the demand for the leasing of degraded forest lands for raising captive plantations. This is being bitterly opposed by Non Government Organisations (NGOs) and environmentalists.

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3. The Government of India finally passed Protection of Plant Varieties and Farmers' Rights, Act in 2001 though it is yet to be implemented. This Act has provisions to protect rights of the plant breeders. See Box 3.8.

4. Several companies have changed their manufacturing process so that they can use farm forestry species such as eucalyptus, *subabul* (*Leucaena leucocephala*) and casuarina instead of hardwoods and bamboo (Lal 2000). One company – Nepa Limited – has started using waste paper as raw material (Sharma *et al* 1999).

5. However, companies – mainly government owned ones – that continue to get the bulk of their raw material supplies from the government forests have shown relatively little interest in exploring alternative sources of raw material supply, such as partnerships with farmers. These include Mysore Paper Mills and Cachar Paper Mills both of whom get 100% of their raw material from government forests; Hindustan Newsprint Limited (97.5%) Tamil Nadu Newsprint and Paper Limited (80%) and Nagaon Paper Mills (60%) (CSE 1999).

During the last decade or so, a number of plantation investment companies have also been floated.

All these initiatives – company-farmer partnerships, plantations on degraded forests and plantation companies – are of great significance as they seek to find solutions to the three important ills of low productivity, scarcity of land and lack of investment capital that ail the sector. Experience of these initiatives is examined separately in this section.

### 3.1 Initiatives to secure raw material from farm lands: company-farmer partnerships

The National Forest Policy specifically encourages company-farmer partnerships:

*“As far as possible, a forest based industry should raise the raw material needed for meeting its own requirements, preferably by establishment of direct relationship between the factory and the individuals who can grow the raw material ... the practice of supply of forest produce to industry at concessional prices should cease” (GoI 1988).*

A number of companies took up this initiative and tried out various schemes to form partnerships with the farmers. In order to understand these initiatives, detailed case studies of four companies were prepared. The companies were Wimco Limited (see Box 3.3), ITC Bhadrachalam Paperboards Limited (see Box 3.4), JK Corp Limited (see Box 3.5) and Ballarpur Industries Limited, SEWA Unit (see Box 3.6). In addition, a survey based on secondary literature review and postal questionnaire was carried out to obtain information about similar efforts made by other companies (see Box 3.7). The following sections present the achievements of the various companies as well as the lessons from the case studies.



#### Box 3.3 Wimco Limited

Wimco Limited is the leading safety match manufacturing company in India. The company has a total annual manufacturing capacity of 5000 million boxes (50 sticks each) of safety matches and consumes about 75,000 m<sup>3</sup> of wood annually (Joshi and Chandra 2000). While the company has six factories located in different parts of the country, this case study mainly concerns the initiatives taken by the company in north India, primarily to meet the raw material requirements of its factory located at Bareilly in Uttar Pradesh.

The company began to focus on farm lands when it started facing shortages of its main raw material – *semal (Bombax ceiba)* – that it was getting from government forests.

The company identified poplar as a suitable alternative and decided to promote its farming. Extension efforts in Uttar Pradesh started in 1981. To start with, planting

stock was provided free of cost to the farmers but the results were not encouraging. The survival rate of seedlings was 56% in 1981.

Consequently, in 1982 the company decided to stop free supply of seedlings and charge a nominal price from the farmers. The survival rate improved to 85% in 1982 and 90% in 1983.

From 1984 to 1994, the company ran a bank loan scheme for encouraging poplar planting under agroforestry systems in the irrigated agriculture belt of western Uttar Pradesh, Punjab and Haryana. Under this scheme, farmers were provided loans through local banks for taking up poplar plantations, which were refinanced by NABARD. Wimco provided high quality planting stock and technical assistance to the farmers and also provided them an assured market for their produce by offering a buy-back guarantee at predetermined rates. Under this scheme, over 15 million poplar seedlings (called entire transplants or ETPs) over 30,000 hectares were planted by more than 15,000 farmers.

However, the experience with the scheme has been somewhat mixed for all the three parties involved: farmers, banks and Wimco. Although several farmers made a good profit by participating in the scheme, many lost heavily as they did not take good care of the trees due to the mistaken belief that Wimco would pay them a fixed amount per tree after eight years irrespective of the size of the tree (see Section 3.1.2). Wimco failed to achieve its major objective of getting raw material for its factory as most farmers preferred to sell their produce elsewhere. The highest number of trees bought by Wimco, as a proportion of trees planted eight years ago under the scheme, was merely 11%. Although banks got back most of the loaned amount, there were cases of loan default. A number of disputes also emerged between the three parties that even led to litigation. About 550 court cases were filed against Wimco by the farmers who were either dissatisfied with the technical assistance provided by Wimco or wanted to make Wimco a party to the loan default proceedings initiated against them by the banks. In addition, the company got involved in arbitration proceedings in 2332 cases mainly to recover its dues for ETPs and technical services from the farmers.

Wimco decided to change its strategy after its bank loan scheme ran into problems and the company faced litigation. In 1993, the company started direct sale of ETPs to farmers at commercial rates. In 1994, the company closed the bank loan scheme. Between 1993 and 2000, the company sold 13.8 million poplar ETPs to the farmers of Uttar Pradesh, Punjab and Haryana (Joshi and Chandra 2000).

The company has decided that in future it will concentrate mainly on research for the development of new and better clones and their sale on a commercial basis. The company does not wish to enter into any technical extension or buy-back arrangement with the farmers. The technical guidance regarding selection of proper clones, site, method of planting, tending and cultural operations is provided to the farmers by the Wimco extension staff at the time of purchase of ETPs and their planting. This is built into the cost of the ETPs. However, beyond this the company does not take any responsibility for the trees or their marketing.

### Box 3.4 ITC Bhadrachalam Paperboards Limited

ITC Bhadrachalam Paperboards Limited (ITC BPL) has an integrated pulp and paper mill located at Sarapaka in the Khammam district of Andhra Pradesh. This mill was established in 1979 and currently has an installed capacity of 65,000 MT of pulp and 1,82,500 MT of paperboards and paper per year. It requires nearly 0.26 million MT of freshly felled pulpwood annually.

The company decided to promote tree plantation on farm lands after it realised that supplies from government forests are going to decline in the future, and it would be difficult to raise captive plantations due to land ceiling laws and restrictions on leasing of forest lands.

The company started distributing free eucalyptus seedlings in 1982 and continued this effort until 1986. During this period, the company distributed 4.67 million seedlings to farmers (Lal *et al* 1997). However, the company decided to discontinue this approach as the response of the farmers was not very good and they did not take adequate care of the seedlings supplied free of cost to them (Lal 2000).

In 1987, the company started a bank loan scheme similar to the one started by Wimco. This scheme, which was supported by NABARD, continued until 1995. During this period 7,441 hectares of tree plantations were raised on the holdings of 6,185 farmers in 1,138 villages in the districts of Khammam, Guntur, Krishna, West Godavari, Nalgonda, Warangal, Nellore and Prakasam. However, this was far less than the targets set under the scheme.

The overall experience with the scheme was not very satisfactory for the company as it encountered a number of logistical problems (especially in getting the farmers' loans sanctioned) and also failed to achieve its primary objective of getting raw material for its mill. Merely 28% of the farmers participating in the scheme got their loans sanctioned. Further, most farmers sold their produce elsewhere because (1) they harvested their plantations earlier than the rotation period stipulated in the scheme and (2) the company would have first repaid the bank loan and paid only the balance amount to the farmer. The company even waived its due service charge of Rs. 70 per MT but very little material came to it. Thus, ITC BPL decided to discontinue the scheme after 1995.

At present, the company is concentrating on research to develop better clones and on commercial sale of clones to the farmers. The research and development programme of the company started in 1989; and the company is currently supplying 11 eucalyptus clones (called Bhadrachalam clones) on a commercial basis to farmers. While the company currently offers a buy-back guarantee at an agreed price, it plans to do away with this in the future and will offer buy-back guarantee only at the prevailing market rates. Up to 1999-2000, the company had sold over 7.2 million clonal seedlings of eucalyptus. It is also working on genetic improvement of casuarina and plans to produce and sell improved casuarina clonal seedlings in the near future.

### Box 3.5 JK Corp Limited

JK Corp Limited is a large company involved in several fields. The company established JK Paper Mills – an integrated pulp and paper plant – at Jaykaypur in the Rayagada District of Orissa in 1962. The current capacity of this plant is 130,000 tonnes per annum (TPA) of pulp and 90,000 TPA of paper (Sharda, n.d.).

The company was getting adequate raw material supplies from the government forests until the 1980s. In subsequent years, however, several restrictions were placed on the felling of government forests. This forced the company to explore alternative sources of raw material supply. The company formed a separate wing within its raw material procurement agency (Forest Organisation) in 1990 to focus on plantations on farmers' lands.

In 1990, the company started a leasing/ share cropping scheme. It was mainly targeted at absentee landlords and other farmers who were unable to cultivate their dry and fallow lands. The company bore the entire cost of raising and maintaining the plantation on the farmers' lands and the farmers were paid a fixed sum of money on monthly, half-yearly or annual basis. However, due to problems such as unclear tenure and illicit felling of plantations, the company decided to discontinue the scheme after 1997. During this period, the total area coverage under the scheme was only 139 hectares.

In 1993, the company started a bank loan scheme (similar to the schemes of Wimco and ITC BPL) with assistance from NABARD. The experience with this scheme has also not been very encouraging for the company. Although the target for the scheme was 5000 hectares, only 3205 hectares could be covered. The main problems faced by the company were two-fold (1) ineligibility of many farmers for loans and (2) non-cooperation from the bank officials. The company decided to discontinue this scheme in 1998.

The company has been supplying seedlings at subsidised rates to farmers since 1990. It has set up decentralised nurseries and invests significantly in extension efforts. The company also enters into a buy-back arrangement with the farmers. Up to 1999, plantations over 12,935 hectares were raised through this scheme. In future, the company has decided to concentrate on extension and seedling sale. It has started its own research and development programme to develop better clones of eucalyptus and other species. The company started commercial production of six eucalyptus clones (called JK Super Clones) in 1999. While 0.15 million seedlings were produced in 1999, about 0.35 million were produced in 2000. The plan for 2001 is to produce about 0.7 million seedlings. These are sold at commercial rates to the farmers. The company aims to shift entirely to clonal seedlings in a few years' time.

A number of companies, apart from the four mentioned in Boxes 3.3 to 3.6, have also taken steps to secure their raw material supplies from farm lands. A summary of different initiatives is presented in Box 3.7.

### Box 3.6 Ballarpur Industries Limited, SEWA Unit

Ballarpur Industries Limited (BILT) manufactures over 60% of the country's value-added paper and accounts for nearly one-fifth of the country's overall paper production. BILT has four paper mills in different parts of the country. One of the BILT owned pulp and paper production plants is located at Gagnapur, Jeypore in the Koraput district of Orissa and is popularly referred to as the SEWA Unit. The mill has a capacity of 36,500 TPA, which is likely to be enhanced in future to 64,000 TPA. Currently, the mill's annual raw material requirement is about 0.15 million MT of pulping material comprising about 30,000 MT of bamboo and the remainder hardwoods.

The mill was lying closed for some time until it was taken over by BILT and restarted in 1993. Since then, the company has made efforts to procure its raw material from farm lands as supplies from government forests have declined and are likely to reduce further in the coming years.

The company started a share cropping scheme for raising eucalyptus and acacia (*Acacia auriculiformis*) plantations in 1994. It entered into a share cropping arrangement with individual farmers under which the farmers provided their land to the company for raising plantations and in return got a share of the produce. This share was paid in advance to the farmers in the form of equated annual instalments. All planting, maintenance, protection and harvesting expenses were borne by the company. Although the response from the farmers was good, the company was forced to close the scheme in 1996 due to litigation over issues of 'alienation' of tribal land. The share cropping arrangement worked out by the company with tribal farmers was declared illegal by the government based on a state law that prohibits transfer of tribal land to non-tribals. Under this law, the definition of 'transfer' is quite broad and includes even leasing and mortgage.

After the stoppage of the share cropping scheme in 1996, the company started distributing subsidised seedlings of eucalyptus and acacia to the farmers. Between 1996 and 1999, the company sold over two million seedlings. It also started a bank loan scheme with assistance from NABARD in 1999. However, this being a new initiative, the experience with this scheme is not yet available.

In the future, the company wishes to concentrate mainly on production and sale of seedlings to the farmers. The company prefers this approach as there is less possibility of legal complications. The only drawback that the company has felt so far is that some farmers, especially tribals, do not take adequate care of the subsidised seedlings. As a result, the company is planning to slowly reduce the subsidy and ultimately stop it. In the future, the company would like to concentrate only on the commercial sale of seedlings, even if the volume of sale reduces.

In order to make the plantations more attractive to the farmers, the company is also planning to introduce high-yielding clones of eucalyptus in the area. It is already engaged in research and development work on this aspect at its other units. However, the future success of this approach is dependent on government policies. For instance, the recent imposition of transit permit requirement for eucalyptus in three districts of Orissa may discourage tree planting by the farmers (see Section 8.3.2).

### Box 3.7 Selected company-farmer partnership initiatives

Company name	Year of initiation of the effort				Remarks
	Supply of subsidised seedlings	Bank loan scheme	Leasing/ share cropping	Research and development	
Andhra Pradesh Paper Mills	1989 <sup>1</sup>				At present, 20 million seedlings are being distributed annually.
BILT Yamuna Nagar	1996		1992-93	1997 <sup>2</sup>	Leasing/ share cropping scheme has been closed. The target for the seedling distribution scheme in 1998 was 1 million seedlings.
Sirpur Paper Mills	1979	1994	1997	Late 1990s	The seedling distribution scheme ended in 1997. Under this scheme, over 10 million seedlings were distributed. The farm forestry scheme operated from 1994 to 1996. In late 1990s, company started producing clonal plants.
West Coast Paper Mills	1996		1998	Late 1990s	Between 1996 and 1999, 9 million seedlings were distributed under the seedling distribution scheme. The company is continuing with this scheme. The leasing/ share cropping scheme is also continuing. The company has developed high-yielding <i>Acacia</i> hybrids and planned to produce 0.5 million <i>Acacia</i> ramets annually by the end of 2000.
Century Paper Mills	1992-93				In 1998-99, the scheme covered 1500 hectares of eucalyptus and 300 hectares of bamboo plantation. It plans to expand this scheme in future.
SIV Industries	1988				Till now the company has supplied around 26 million seedlings. The scheme has operated at a very low scale since 1997 as the factory has been closed due to environmental reasons.
Nuchem	1997				Between 1997 and 2000, the company sold over a million poplar ETPs.
Central India Board Products <sup>3</sup>	1997				The company is collaborating with the local FD and supplying subsidised <i>subabul</i> seeds and seedlings to meet its annual raw material demand of around 13,000 MT. In the first year, 351 farmers in 59 villages planted over 0.2 million <i>subabul</i> trees.
Hindustan Newsprint Ltd.	1993 <sup>4</sup>				The company is distributing around a million seedlings every year.

#### Notes:

1. The efforts started in 1977 but gained momentum only after 1989.
2. Research and development efforts are on at Choudwar Unit of BILT in Orissa.
3. Source: Shrivastava 1997
4. Started plantation on leased forest land. The company is also distributing subsidised seedlings to farmers.



### 3.1.1 Types of partnerships and progress to date

The efforts of the companies for the promotion of tree farming by farmers can be broadly classified as follows:<sup>6</sup>

1. Supply of free or subsidised seedlings with or without a buyback guarantee.
2. Bank loan schemes under which the company helps the farmer in getting a bank loan to plant trees and provides planting stock, technical extension and buyback guarantee.
3. Leasing or share cropping schemes under which the company raises and maintains plantations on farmers' land and pays them a fixed lease rent or a share in the crop.
4. Intensive research and development and commercial sale of improved clonal planting stock with or without buyback guarantee.

The various schemes started by the industry have two major achievements to their credit. Firstly, they have generally popularised the concept of tree farming and secondly, they have directly contributed to the cultivation of a large number of commercial trees on private lands. The information available from twelve companies indicates that together these companies are producing and distributing over 53 million seedlings annually (see Table 3.1).

Name of the company	Current annual supply of seedlings (million)	
	Seed-route	Clonal
Wimco		2.7 (poplars)
ITC Bhadrachalam Paperboards		2.7
Andhra Pradesh Paper Mills	20.0	
JK Corp <sup>1</sup>	7.65	0.35
Ballarpur Industries	3.0	
Sirpur Paper Mills <sup>2</sup>	0.95	
West Coast Paper Mills	3.8	0.2
Orient Paper Mills	4.5	
Century Paper Mills	6.0	
SIV Industries <sup>3</sup>	0.1	
Nuchem	0.1	0.35 <sup>4</sup> (poplars)
Hindustan Newsprint Limited	1.0	
Sub Total	47.1	6.3
<b>Grand total</b>		<b>53.4</b>

#### Notes

1. Calculated from current year's target of 3200 hectares assuming 2500 seedlings per hectare.
2. Calculated from area coverage between 1997 and 1999 assuming 2500 seedlings per hectare and uniform distribution rate during these years.
3. SIV industries distributed 7.346 million seedlings in 1996 when its mill was in operation. Currently, it is closed due to adverse environmental impact of the mill.
4. Total sale of poplar Entire Transplants of Poplars (ETPs) in Uttar Pradesh, Punjab and Haryana by companies other than Wimco is estimated to be 1.4 million per year (Chandra 2000).

6. It is seen that most companies restrict their extension efforts to areas in close proximity to their plant site. Although several companies are purchasing wood from distant areas, they are less willing to directly implement their schemes in more distant places as (i) they would like to create their raw material base near the plant site so as to save on the transport costs and (ii) there is likelihood of most of the produce in far away sites being diverted to other plants in and around that area.



ITC BPL extension staff taking measurements on a farmer's field. Company extension staff have played an important role in popularising new trees such as (in this case) eucalyptus clones in Andhra Pradesh

The total annual area coverage, assuming 500 trees per hectare in case of poplars and 2500 in the case of other species, comes to about 26,000 hectares every year. Largely due to the pioneering efforts of Wimco, a large number of poplar nurseries have sprung up in Uttar Pradesh, Punjab and Haryana. The estimated total production of ETPs by these private nurseries is about 8 to 8.5 million annually. In addition, companies other than Wimco and Nuchem are estimated to be producing 1.05 million ETPs annually (Chandra 2000). This translates to an additional area of about 19,000 hectares taking the total annual area to 45,000 hectares (62.95 million seedlings).

Although information is not readily available regarding the efforts made by companies other than those listed above, the contribution of industries to annual plantation in the country is clearly significant.<sup>7</sup> Further, out of the

total seedlings supplied by these companies and private poplar nurseries, about a quarter are of clonal origin, which have high productivity as well as disease resistance. The industry is thus making a substantial contribution to the production of wood on non-forest lands.

Apart from supplying seedlings, these companies also invest a lot of effort in extension work to popularise tree farming. Several companies have extension staff, who interact with farmers regularly. The company extension staff played an important role in popularising new trees among farmers such as poplar in Uttar Pradesh, Punjab and Haryana and eucalyptus clones in Andhra Pradesh. Several companies set up demonstration plots (e.g. Wimco, ITC BPL) where farmers are shown the growth of a particular species or clone. Most companies also publish literature related to tree farming in local languages and conduct workshops and tours for the farmers. Companies such as JK Corp. have set up a large number of billboards on roads while the staff of some others, such as Wimco, regularly participate in broadcasts about tree farming on local radio.

### 3.1.2 Company-farmer partnerships: emerging experience

Although many companies have taken up partnership schemes with farmers, it is less a matter of choice than of compulsion. Given a choice, most companies

7. Kitply industries have raised *Gmelina arborea* plantations over 800 hectares.

would like to raise their own captive plantations rather than deal with farmers as elaborated below.

### **Experience with free/ subsidised seedling schemes**

Most companies start their efforts with the supply of free or subsidised seedlings to farmers (called social forestry in the parlance of companies). However, it is seen that farmers generally do not take adequate care of the seedlings supplied to them free or at heavily subsidised rates. As a result many companies have either reduced or completely stopped the subsidy in seedlings (e.g. Wimco, ITC BPL, BILT SEWA Unit and Sirpur Paper Mills) or are planning to do so in the near future (e.g. JK Corp.). Some companies, notably Andhra Pradesh Paper Mills (APPM) have, however, continued with this approach and supply large numbers of subsidised seedlings to farmers every year.

### **Experience with bank loan schemes**

Bank loan schemes appear to be the second stage in the evolution of company-farmer partnerships. Companies such as Wimco and ITC BPL found the subsidised seedling approach to be ineffective and abandoned it and instead started bank loan schemes. Some other companies (e.g. JK Corp, BILT SEWA Unit) started bank loan schemes alongside their seedling distribution schemes.

Under bank loan schemes, farmers are provided loans by the bank for raising tree plantations while the companies provide improved planting stock, technical extension and buyback guarantee. The general experience of these bank loan schemes has not been very satisfactory. Three out of four schemes examined have been discontinued due to various problems encountered by the companies, farmers and the participating banks. The main problems with these schemes are described below:

- *Cumbersome loan sanction and instalment release procedures* – The process of getting loans sanctioned and instalments released was cumbersome and time consuming for the companies as well as farmers. The company staff often had to spend a great deal of their time chasing the bank officials. The loan instalments were often released after the work was completed defeating the very purpose of the loan. In most cases, the company and the farmer had to make the initial investment themselves. As a result, farmers did not make adequate investment and consequently their plantations did not grow well. In many cases, the farmers were refused loans by the banks as they did not fulfil the eligibility criteria.<sup>8</sup> For instance, only 28% of the participating farmers got loans in the case of the bank loan scheme promoted by ITC BPL. In many cases, the company had already supplied seedlings in anticipation of the farmers getting the loan and thus suffered losses when several farmers did not get their loans sanctioned and refused to pay the company. In general, smaller banks such as co-operative banks have handled these schemes much better than the larger nationalised banks.

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8. Eligibility criteria *inter alia* included clear land title and no mortgage on the land for any other loan.

- *Lack of clarity* – Under all the schemes, there was confusion in the minds of the farmers over the terms and conditions of the scheme. In most cases, the agreements between the company, farmer and the bank were prepared only in English and the farmers did not understand the provisions properly. Many farmers did not even retain a copy of the agreement. For instance, there was considerable confusion over the buy-back guarantee offered by Wimco and several farmers failed to understand the concept of ‘harvestable tree’. They believed that Wimco would purchase *all* their trees at the predetermined rates after eight years. This led to much litigation.
- *High company charges* – Most farmers felt that the seedling and the technical extension charges being taken by the companies were very high. For instance, Wimco charged a high rate for ETPs and technical extension as poplar was a new crop for farmers. However, the farmers quickly mastered the technique for growing poplars and were unhappy over high rates being charged by the company.
- *Diversion of loan amount* – Many farmers diverted the loan amount for other purposes and did not take adequate care of the trees planted. Some planted these on marginal lands, where growth was poor. However, the cases of loan default were few as all the loans sanctioned under these schemes were secured loans. In some cases, such as BILT SEWA Unit’s scheme, the sanctioned loan amount was much higher than the actual amount needed for plantation. Thus, the company encouraged the farmers to use the balance amount to raise plantations over a larger area rather than using it for consumption purposes.
- *Rotation and buyback* – Most farmers harvested their trees earlier than the rotation period envisaged under the schemes. These companies got back very little of the wood produced under the schemes despite offering a buyback guarantee. For instance, the highest number of trees bought by Wimco, as a proportion of trees planted eight years ago under the scheme, has been only 11%. In cases where the companies were to deduct the seedling cost and technical extension at the time of purchase of wood from the farmer (e.g. ITC BPL and JK Corp schemes), they found it difficult to recover their due amount as farmers often sold the wood elsewhere. Later on, most companies started charging the seedling and extension costs up front.

The experience with the bank loan schemes has not been very good and in three cases where the schemes have run their full term, neither the companies nor the farmers are interested in joining a similar scheme in the future. Still, in spite of all their drawbacks, these schemes did play an important role in popularising tree farming in the areas where such schemes were implemented. The availability of loan, package of technical services, buy-back guarantee and extension efforts made by the companies convinced many farmers to try tree farming for the first time. Many, who found it to be a profitable venture, continued even after the closure of the scheme. The immense popularity of poplar farming in northwest India even after the closure of the Wimco scheme is a good example of this.

### **Experience with leasing/ share cropping schemes**

Some companies such as JK Corp, BILT, West Coast Paper Mills and Sirpur Paper Mills have tried leasing or share cropping schemes. Under these schemes, contiguous patches of land belonging to several farmers are obtained by the company on lease or share cropping basis for raising plantations. In this way, these companies have attempted to overcome the land ceiling restrictions.

The experience of JK Corp and BILT from the Shree Gopal and SEWA Units has not been encouraging and the schemes have been closed at all three places. In JK Corp's case, the company faced problems of litigation as well as pilferage from the plantations. In the case of BILT SEWA Unit, which is located in a Scheduled Area, the company had worked out an arrangement with the farmers whereby their share in the crop was paid to them in the form of advance instalments every year till the rotation age. This arrangement was, however, declared illegal by the district authorities as per the provisions of certain laws relating to transfer of immovable property from tribals to non-tribals. A number of court cases were also filed against the company. One farmer also breached his agreement with the company and harvested trees prematurely and sold the wood elsewhere. The company has filed a court case but is not very hopeful of a positive outcome. It appears that, given the political climate and the time taken by courts to decide a case, prosecution is not a practical option for enforcing the provisions of such agreements.

In the case of Sirpur Paper Mills and West Coast Paper Mills, the company invests in raising the plantation on the farmer's land. The produce is shared between the two in specified proportions. However, as these schemes are relatively new, results from experience regarding their performance are not yet available.



### **Experience with research and development and commercial sale of seedlings**

In recent years several companies have changed their strategy and, instead of forming a direct partnership with the farmers, they are concentrating their efforts on research to develop high-yielding clones, which they produce and sell to the farmers at commercial rates.

The two most notable efforts in this regard are development and popularisation of poplar clones by Wimco in north-west India and eucalyptus clones by ITC BPL in Andhra Pradesh. Other companies that are engaged in development and production of clonal plants include West Coast Paper Mills, Karnataka; JK Corp, Orissa; Mysore Paper Mills, Karnataka; BILT, Orissa; Century Paper Mills, Uttar Pradesh; SIV Industries Limited, Tamil Nadu; Sirpur Paper Mills, Andhra Pradesh and Nuchem Limited, Haryana.

Companies are favouring this approach as it is less cumbersome. One-off sale of seedlings is much simpler than signing agreements with the farmers and there is no follow-up requirement or risk of getting embroiled in litigation. Further, as the productivity of clonal plants is far higher than seed route plants, the companies



**Wimco Seedlings Ltd. stall at a farmers' fair. Like some other companies, Wimco now favours commercial sale of clonal seedlings rather than direct partnerships with farmers**

can get their raw material supply from a smaller area. This means that the companies have to deal with a smaller number of farmers, which reduces the extension costs for the company. The high productivity of the clonal plantations also makes farm forestry an attractive option for the farmers. However, the high investment needed for raising and maintaining clonal plantations limits participation to the better-off farmers. This also suits the companies as large and/ or well-to-do farmers, as compared to small and marginal farmers, take better care of their plantations. It is also logistically easier and cheaper for the company to collect its raw material from a few large plantations rather than many small and scattered plantations.

Due to these reasons, more and more companies are adopting this approach. Out of the four companies studied in detail, two of them, Wimco and ITC BPL, have completely shifted to this approach, JK Corp is in the process of doing so and BILT SEWA Unit is also likely to follow suit. The significance of these companies' involvement in research and development can be gauged from the fact that while average annual plan expenditure on research and development in the forestry sector in the country during the VIII Five-Year Plan (1992-97) was about Rs. 225 million (GoI 1999), one company (ITC BPL) alone spent about Rs. 5.5 million on research and development annually between 1989-90 to 1997-98. Another company, Wimco, spends between Rs. 5 to Rs. 6 million annually on research and development. Information regarding the investment by other companies is not readily available but it is reasonable to assume that companies' investment in research and development constitutes a significant proportion of total investment into research and development in the country. These companies have developed a large number of high-yielding clones of poplars, eucalyptus, acacia, casuarina and other species in a short time.

These clones are quite popular with the farmers despite the high rates charged by these companies – Wimco charges Rs. 12-18 per ETP, ITC BPL Rs. 8 per seedling and JK Corp Rs. 6 per seedling. The combined sale of Wimco, ITC BPL and JK Corp is about 5.75 million clonal seedlings per annum. In money terms it comes to sale of about Rs. 72.3 million each year and the figure is likely to increase sharply in the future.

This system of production and sale of high quality seedlings on a commercial basis seems to be working well at the moment. However, in the case of poplar, Wimco has begun to face stiff competition from other private nurseries that are producing and selling ETPs at much lower rates. Although these nurseries are only multiplying the clones developed by Wimco, the company is unable to take any legal action against them due to absence of patenting or a system of nursery registration. (The government has recently tried to address this issue by the introduction of the Protection of Plant Varieties and Farmers' Rights Act, 2001 though it is yet to be implemented. See Box 3.8). Companies producing clones of other species such as eucalyptus have not started facing this problem as yet since multiplication of clones of these species is relatively more difficult than poplar. Another possible threat to this approach is from changes in the tree felling and transit requirements. For instance, the BILT SEWA Unit's seedling distribution scheme in Orissa is likely to be severely affected by the recent reintroduction of timber transit permit requirement for eucalyptus. The permit requirement has been reintroduced to check pilferage from eucalyptus plantations raised by the FD on government forest lands. This is, however, likely to adversely impact on the growth of eucalyptus plantations on farm lands.

### Box 3.8 Protection of Plant Varieties and Farmers' Rights Act, 2001

The issue of enacting a law relating to plant varieties protection became important after India signed the agreement on Trade Related aspects of Intellectual Property Rights (TRIPs) in 1994. India ratified the WTO agreement on 30 December 1994 and the agreement came into force with effect from 1 January 1995. Article 27.3 (b) of TRIPs requires the member countries to protect plant varieties through patenting, effective *sui generis* system or a combination thereof.

In order to honour its international commitment under TRIPs, the Indian Parliament finally passed the Protection of Plant Varieties and Farmers' Rights Act in its monsoon session in 2001. The salient features of this legislation are:

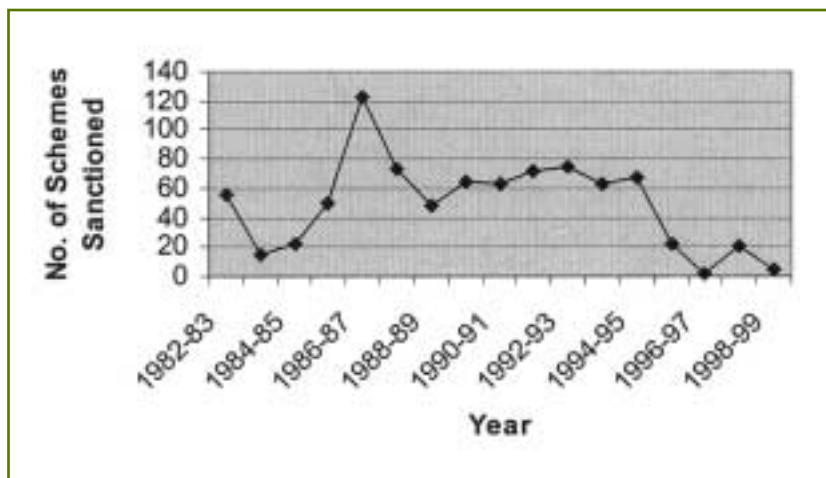
- A *Protection of Plant Varieties and Farmers' Rights Authority* will be created to enforce the provisions of the Act.
- A national *Plant Varieties Registry* will be formed. A *National Register of Plant Varieties* will be kept at the head office of the Registry.
- A new variety will be registered under this Act if it conforms to the criteria of novelty, distinctiveness, uniformity and stability.
- A certificate of registration will be valid for a maximum period of 18 years in case of trees and vines.
- Registration will confer exclusive rights on the breeder or his licensee to produce, sell, market, distribute, import or export the variety.
- A *National Gene Fund* will be constituted.

### Financing support for partnerships

The forestry sector has not been able to attract the desired level of institutional finance. Although, at the national level, NABARD offers refinance support through a number of bankable schemes, its cumulative disbursement to the forestry sector as on 31 March 1999 was a modest 0.6% of its total disbursement. There are several reasons for this. Forestry continues to be perceived as a high-risk venture and, in order to be credit worthy, the forestry projects are expected to have a minimum Internal Rate of Return of 15% at constant prices. This tends to operate against long gestation tree crops. Further, hypothecation<sup>9</sup> of trees has not worked in practice (Pethiya 1993) and insurance premiums are often unaffordable.

If one looks at the number of schemes related to forestry and wastelands development sanctioned by NABARD over the years, one can observe a sharp decline in the number of schemes sanctioned after 1994-95. This may be due to interest rate deregulation because of which NABARD's refinance rate became as high as 12% and resulted in the ultimate lending rates as high as 16%. Earlier these were only 8% and 12.5% respectively (Haque 2000a) (see Figure 3.1).

**Figure 3.1** Number of schemes related to forestry and wastelands development sanctioned by NABARD



Source: Haque 2000a

### 3.1.3 Summary of findings on company-farmer partnerships

In recent years, a large number of wood-based industries have attempted to promote tree farming on farm lands in order to secure their present and future raw material supplies. Sporadic efforts by individual companies started in the mid-1980s but most initiatives began in the 1990s.

9. Hypothecation refers to the right to liquidate the asset/ produce from the asset to recover the loan given against the asset.





Photo: Sushil Saigal

**A modern tree nursery at BILT, SEWA unit. Annual production of seedlings by companies such as BILT now totals more than 53 million, covering an area of about 26 thousand hectares each year**

The driving forces behind these initiatives are the (1) declining supply of cheap raw material from government forests on account of policy changes and (2) increased competition due to economic liberalisation process.

Several companies have tried to forge partnerships with farmers over the past decade or so. However, the experience with different partnership schemes has been somewhat mixed. The current thrust of most companies is simply on production and supply of seedlings to the farmers without entering into any specific partnership with them. This is due to problems such as:

- Lack of care of subsidised seedlings by farmers
- Cumbersome loan sanction procedures
- Lack of clarity about the agreement with the company among farmers
- Diversion of loan amount elsewhere by farmers
- Failure of companies to obtain the raw material despite giving buy-back guarantee
- Unclear legal framework governing leasing/ share cropping scheme, especially in tribal areas
- Litigation
- Difficulty in accessing finance at concessional rates

Several companies are currently focussing on tree improvement work to make farm forestry more attractive to farmers. This requires considerable investment of time, money and effort into research and development for identifying suitable species and developing and multiplying improved clones. The experience of companies studied indicates that the corporate private sector can make a significant contribution in forestry research and development work. Due to

their commercial interest, several companies have carried out intensive research and development work in the past few years and shown results in the form of better clones and packages of management practices. Another advantage with private sector research and development is that, unlike in government institutions, research and managerial staff are not frequently transferred. This is crucial for the success of forestry research and development work, which requires sustained efforts over several years or even decades.

At present, there is little sharing of experience among different companies and most are working in isolation. Consequently, most companies have devised their seedling distribution, bank loan and research and development programmes without taking advantage of the experience of other companies that may already have attempted similar programmes. Some isolation due to competition among various companies is understandable, but the current situation seems to be more a result of lack of initiative than a deliberate attempt to withhold information. There is a need to encourage sharing of information among different companies.

Overall, the contribution of the companies here is significant and it is directly contributing to establishment of tens of thousands of hectares of high-yielding plantations every year. The indirect contribution through extension efforts is also not insignificant. However, the role of the corporate private sector can be further enhanced with suitable policy and administrative changes (see Section 8).



## 3.2 Commercial plantations on degraded forest lands

The corporate private sector has been lobbying for the past several years to get degraded forest lands on lease for raising captive plantations. This is being strongly opposed by some NGOs and environmental action groups (see Box 3.9).

According to industry sources, the main reason behind the demand for degraded forest lands is that after economic liberalisation, Indian wood-based industry (e.g. paper industry) has started facing stiff competition from overseas companies, which generally have much larger units and thus enjoy competitive advantage over Indian companies due to economies of scale. Thus, the Indian companies argue that they too would have to increase the size of their units in order to remain competitive. However, the companies are unwilling to make the large investment needed for setting up new plants (e.g. paper mills) unless at least about a half of their future raw material supply is available from assured sources. In the companies' view, supplies from farm forestry are not reliable and at least half the supplies should come from committed sources such as captive plantations or government supplies. The lack of assured supplies has been cited as the reason for no new green field investment in an integrated pulp and paper mill for the past twenty years. Likewise, there has been no major expansion of wood/bamboo based pulp mills with the exception of JK Corp, who have replaced their pulp mill at Rayagada with a new one of 350 MT per day capacity. According to

**Box 3.9 Arguments for and against leasing of degraded forest lands to the industries**

For	Against
<p>There is a great deal of degraded forest land in India which is of no use to anyone. It is lying waste and should be made available to anyone who wishes to use it.</p> <p>The main constraint in the way of restoring the productivity of such lands is lack of resources. The resources required for increasing the productivity of degraded forest lands through large-scale technology based plantations are considerable and are not easily available in the public budget.</p> <p>Industry is keen to be involved in the afforestation of degraded lands because it is an economically profitable venture.</p> <p>Involving the industry in establishing high-yielding fast-growing plantations on degraded forest land will result in accelerated rehabilitation of these lands and thereby help in greening India.</p> <p>There is a shortage of raw material required by the paper and pulpwood industry; the deployment of capital and technology by the industry would amount to additionality of efforts towards afforestation, and therefore will be socially desirable. It will, without asking for public resources, create new jobs and thus will be a win-win strategy.</p> <p>There are no serious social or environmental issues in putting degraded forests under industrial plantations.</p>	<p>The degraded forest lands are not totally 'unproductive' as they satisfy fuelwood, fodder and livelihood needs of about 100 million people.</p> <p>The main reason for the degradation of these lands is not lack of technology or resources but extreme biotic pressure. These lands do not need capital investment or technology but protection which can only be achieved through working with local people for which industry doesn't have expertise or patience.</p> <p>While natural regeneration would result in multi-layer mixed forests, industry would raise monocultures of short rotation crops.</p> <p>The degraded forests are not available in contiguous patches and are usually interspersed with better quality forests making leasing of only degraded forests difficult.</p> <p>The large industries consume just a fraction of the forest products and 90% of raw material is processed by small and cottage units. If land is leased to large industries, similar demand will also come from smaller units as well as other plantation industries such as coffee, palm, cashew etc.</p> <p>Leasing of forest lands is against the National Forest Policy, Forest (Conservation) Act and <i>Panchayat</i> Act (in tribal areas).</p> <p>The industry is not interested in totally barren land as is evident from their lack of interest in developing non-forest wastelands offered to them by Governments of Rajasthan, Gujarat, Uttar Pradesh and Madhya Pradesh.</p>

Making industry self-reliant in their own raw material supply is cost-effective as more public resources could then be diverted for better protection and conservation of natural forests.

Farmers cannot be trusted to supply raw material to the industry, as farmers are essentially concerned with meeting their subsistence needs and have no interest in growing long-gestation crops. In any case relying on farm forestry alone will not give the industry the required cost-effectiveness necessary in today's reformed markets.

The industries' demand can easily be met by farmers as there is 141 million hectares of cultivated land and 20 million hectares of farmer owned uncultivated wasteland. Farmers are already producing a large quantity of wood and there is no overall shortage. The shortages reported are local because most of the production is in green revolution areas whereas industries are located near forest areas.

There is going to be no additionality of production as leasing would reduce farmers' market thereby reducing production in the farm sector.

Source: Planning Commission 1998

industry estimates, the total industrial roundwood requirement for India in 2010 is estimated to be 37 million m<sup>3</sup>, which can be met from 3.7 million hectares of captive plantations.



### 3.2.1 The leasing issue: a possible solution?

The debate over the issue of leasing of degraded forest lands to industry for raising captive plantations has reached a stage of stalemate with both sides (for and against) refuting each other's arguments.

While there is some merit in the industry's argument for need for committed supply sources (especially since industry is unable to raise captive plantations outside forest lands also), the concerns raised by those opposing leasing are also valid. While it was beyond the scope of the present study to go into this issue in detail, it appears that there is a need to explore some solutions which address the needs and concerns of both sides to some extent.

One possible solution could be leasing/ joint management by the corporate private sector of some of the *existing commercial plantations* on forest lands. These plantations are managed by the state owned Forest Development Corporations (FDCs). As these plantations are already in existence and no felling/ conversion of degraded forests will be involved, some of the concerns raised by those opposing leasing of forest lands to the industry would not be applicable in this case. There is a good case for the involvement of corporate sector in the management of these lands as the performance of most FDCs has been far from satisfactory. While FDCs were set up in different states in the 1970s to increase productivity and attract institutional finance for the forestry sector, they have failed on both fronts.

According to the review of the working of the FDCs carried out by a High Level Study Team in 1990, there were 26 FDCs in existence at that time. These FDCs were managing about 1.24 million hectares of plantations, mainly of teak, eucalyptus, casuarina, pines and bamboo along with some plantation cash crops. In the study team's view, the overall performance of the FDCs was not very satisfactory as is evidenced from the quotes from the review report (see Box 3.10).

While it is quite likely that some of the demand for farm grown wood may decline if the companies are able to raise their own captive plantations, it may be more than offset by fresh investments by the companies to expand their capacity if they have assured supplies to meet part of their raw material requirements. It is estimated that India would need an additional 14.4 million MT of raw material annually by 2010 in order to bridge the projected gap of 3.6 million MT of newsprint and paper. Assuming that half the new capacity created will be based on farm grown wood, it will still mean an additional market of 7.2 million TPA for the farm grown wood. The advantage to companies for sourcing some of their supplies from farm forestry is that they do not have to make large investments in planting and maintenance expenses. Thus, it seems likely that companies would be willing to purchase at least a proportion of their raw material requirements from farmers. In any case, most of the wood-based industries are in the small and cottage sectors, which are unlikely to develop their own captive plantations.

**Box 3.10 Extracts from the report of high level study team set up to review the working of the FDCs**

'From the information available, the overall success of these (FDCs') plantations is not as desired ... On an average, the plantations of these FDCs are 55 to 60% successful – Study Team noted that FDCs have not achieved the desired improvement of productivity of forest lands as evidenced by low yield, poor growth and low survival of plantations created by them' (Gol 1990; p.42).

'By and large it is seen that the FDCs with forest plantation activity have not shown desired profitability so far' (Gol 1990; p.45).

'In the opinion of the Study Team, the commercial performance of the FDCs can not be called satisfactory' (Gol 1990; p.48).

The Study Team noted various constraints faced by FDCs that make their operation as efficient corporate entities difficult e.g. the average term of the Managing Director was found to be only 20 months. Although these FDCs were mainly created for attracting institutional finance, by March 1989 FDCs had been able to secure loans of only Rs. 1944.7 million (Gol 1990).

## 3.3 Plantation companies and public investment in forestry

### 3.3.1 The nature of the deal

'Plantation companies' is the generic term used for collective investment enterprises in the forestry and allied sectors, which mobilise investments from the general public for various forestry ventures such as teak plantations. These companies first started operations in the 1980s.<sup>10</sup> A number of forestry and agro-based schemes were started by these companies (such as teak wood units, fruit orchards, rubber plantations, agro bonds etc.) and very high tax-free returns<sup>11</sup> (in the region of 18 to 30% per annum) were offered to the investors. The initial success in mobilising funds by some of these companies led to a mushrooming of such companies throughout the country during the late 1980s and early 1990s.<sup>12</sup> It is estimated that by 1994-95, 3,599 such companies were registered in the country (*Indian Express* report quoted at [indiashow.com/ecoupdate/ecobiz1.htm](http://indiashow.com/ecoupdate/ecobiz1.htm)).

The schemes started by these companies fall into three main categories:

1. Those which offered returns in the form of post-dated cheques to investors, aggregating to returns spread over a specified time frame (financial obligation only).
2. Those which offered returns in the form of post-dated cheques and a share of produce e.g. teak wood (combination of financial obligation and performance-linked obligation).
3. Those which offered returns entirely in the form of a share of produce at a specified period in the future (performance-linked obligation only) (*Business Line* 8 March 1998).

The promoters usually invested a minimal amount themselves and sourced the majority of funds from ordinary investors. Consequently, these schemes were aggressively promoted through media campaigns and a network of commission agents. The advertisements placed in the media emphasised high yields, high returns, tax-benefits and the ecofriendly nature of the investments.<sup>13</sup> The funds were mobilised from investors through agents, who were offered high rates of commission for securing the investments.<sup>14</sup> The estimates for the numbers of agents involved ranges from 0.3 million (*Business Line* 8 March 1998) to 2.5 million (Sinha 1999). Such a large number of agents were involved because of the multilayer marketing system followed by most companies. Investors, lured by the promise of very high returns compared to other avenues, liberally invested in the schemes floated. It is estimated that these companies mobilised anywhere

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10. Sinha (1999) mentions 1987 as the year in which such companies first started their operations.

11. Income from agriculture activities is exempted from income tax.

12. Some schemes were also launched by non-corporate entities such as Association of Persons.

13. By and large, these advertisements did not indicate the risk factors associated with these schemes (SEBI 1998).

14. The commissions offered were at times as high as 10 to 15% of the amount mobilised (SEBI 1998).

between Rs. 100 billion (*Business Line* 8 March 1998) to Rs. 250 billion (*Rediff On The Net Business News* 20 May 1998) from investors.<sup>15</sup> Estimates for the total number of investors ranges from 2.7 million (*Business Line* 8 March 1998) to 15 million (AAPCI n.d.). It is very difficult to get an accurate estimate regarding the actual extent of plantations raised by these companies. One estimate, however, puts it at a mere 25,000 hectares (GoI 1999).

### 3.3.2 Regulation of plantation companies

There was virtually no regulation of plantation schemes until recently.<sup>16</sup> As a result, a large number of schemes were started by unscrupulous companies with the intention of defrauding gullible investors.

The MoEF appointed a committee in April 1996 to study the growth rate and economics of commercial plantations undertaken by these companies. The committee found that the yields being promised by these companies were too ambitious. Further, most companies had raised investments far in excess of norms followed by NABARD.<sup>17</sup> The committee also noted that while calculating yields the companies had not taken into account natural hazards and the insurance cover was limited to input costs only and did not include the promised return (*Indian Express* 23 May 1998).

In 1997, the government decided to regulate these plantation companies. It termed the schemes floated by these companies as 'collective investment schemes' coming under the provisions of the SEBI Act.<sup>18</sup> A committee was appointed under the chairmanship of Dr. S.A. Dave to draft regulations for the collective investment schemes with a view to protecting the investors and also to promoting legitimate investment activity. The committee found that large sums of money had been mobilised by companies that did not have experience of handling agriculture or forestry projects. The schemes were typically open-ended and the disclosures made to the investors were not adequate to enable informed decisions. There were high risks associated with these ventures due to the long gestation periods involved coupled with crop risks. Due to these factors, the committee members felt that some interim measures for investor protection were necessary pending finalisation of regulations. Accordingly, the government restrained the launching of new collective investment schemes until the notification of the regulations. It was also directed that the advertisement code of SEBI would be applicable to such schemes. In 1998, the Delhi High Court issued

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15. SEBI was able to collect information from 654 plantation companies, who had together collected Rs. 25.89 billion from the investors.

16. The Department of Company Affairs could not regulate them as they were not defined as equity, bond, debenture or any other security. Investments in these schemes could not be regarded as loans or deposits so the Reserve Bank of India also could not regulate these. The Securities and Exchange Board of India (SEBI) – the main regulating body of the financial markets – also could not regulate these schemes as they were not securities.

17. While the NABARD norm is only Rs. 12,000 per acre, these companies raised between Rs. 444,000 to Rs. 1.075 million per acre.

18. A press release was issued by the Government on November 18, 1997 conveying that such schemes should be treated as Collective Investment Schemes coming under the SEBI Act, 1992.

a directive to SEBI that all companies running collective investment schemes should get themselves credit rated by SEBI approved organisations (*Business Line* 24 October 1998).

The Dave Committee submitted its report on 31 December 1998. Based on the recommendations of the Dave Committee, SEBI notified regulations for collective investment schemes in 1999. It was made mandatory for the companies operating collective investment schemes to register themselves under the Companies Act, 1956 as well as with SEBI as a Collective Investment Management Company (CIMC). As per the regulations, the collective investment schemes are to be constituted as a two-tiered structure comprising of a Trust and a CIMC. At the time of SEBI registration, each CIMC must have a minimum net worth of Rs.30 million, which would be increased to Rs.50 million in three years' time. While it has been made mandatory for each collective investment scheme to obtain credit rating from a recognised credit rating agency, the schemes have been prohibited from assuring guaranteed returns. Only indicative returns could be mentioned based on projections in the appraisal report. The schemes have to be closed ended in nature and no scheme should be kept open for subscription for a period of more than 90 days. Compulsory insurance cover for the assets of the scheme and personal indemnity cover for the CIMC have to be obtained. Other regulations pertained to expenses, fees, incentive, etc. (*Indian Express* 18 August 1999).



Existing companies were allowed to register themselves and start their business with an initial capital of Rs. 10 million, which would have to be raised to Rs. 50 million over a period of five years. They would also have to comply with all regulations such as compulsory filing of offer documents containing adequate disclosures, mandatory rating requirements, listing of schemes on recognised stock exchanges and accounting and valuation norms as stipulated by the SEBI guidelines (*Indian Express* 18 August 1999).

### 3.3.3 Plantation companies: high risk investments

The general experience with the plantation companies has not been good and many investors are in danger of losing their investments. The industry faced three major problems: (1) the land acquisition process was cumbersome, (2) the cost of raising funds was high, and (3) short term funds were used for financing long gestation projects. However the real problem, as explained later, was that the industry was dominated by unscrupulous players.

The companies found it difficult to acquire land for their projects leading to delays in the start of the projects. Most companies used innovative (and questionable) means to bypass existing land ceiling laws. They were able to obtain land for raising plantations mainly in two ways. The land was either bought in the name of individual investors (land schemes)<sup>19</sup> or it was bought by

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19. This was often used to give a false sense of security to the investors. Quite often the piece of land allotted to individual investor was not distinctly identifiable (SEBI 1998).



the company in the name of its managers, employees or some trusted people from whom the company obtained power of attorney. In many instances, a particular piece of contiguous land was bought by the company and registered in the name of a large number of persons, from each of whom the company obtained a power of attorney in its name (Subramanyam 2000).

As most companies were following the multi-layered marketing system, the cost of raising funds was too high mainly due to competition. While most plantation projects have a long gestation period, these companies were raising short-term funds from the investors and recycling these. Thus, sudden stoppage of inflow of investments and a freeze on their assets created severe liquidity problems and led to their inability to meet maturing liabilities. The panic among investors and sudden demands for withdrawal following adverse publicity in the media and enquiry by SEBI further compounded their problems.

While the above are some of the genuine problems, the main reason behind the collapse of so many plantation companies was that these were floated with fraudulent intentions. In fact, due to the absence of a regulatory framework in the early years, the industry was dominated by such companies. Many companies diverted the funds obtained from investors to other uses such as purchase of real estate. While some companies had done so with the intention of diversifying their portfolio to reduce risks, others had fraudulent intentions (Subramanyam 2000). Some companies just wanted to show that they are in the agro-related or plantation business so that they could get tax benefits.

The current situation is that most companies have defaulted on payments due to investors and some have folded up. Despite a two-month deadline for registration given in August 1999, only 35 companies had registered themselves with SEBI by July 2000 (*The Telegraph* 19 July 2000). SEBI has launched an investigation against several companies. In June 1997, these companies formed an association called the Association of Agri Plantation Companies of India (AAPCI), which, along with the Association of Teak and Agro Companies of India, is lobbying on behalf of member companies with SEBI and other bodies for rescheduling of existing liabilities, more time for adhering to SEBI norms, a cap on fund raising costs and several other issues (AAPCI n.d.). However, as investor confidence in these plantation companies has been completely shaken, it is unlikely that these will play an important role in the forestry sector in the near future.

### **3.3.4 Summary of findings on plantation companies and the potential for investment**

While the overall experience with plantation companies has not been good and many investors are in danger of losing their investments, there are some positive lessons also. One of the main complaints regarding the Indian forestry sector is the low level of investments being made. The experience of plantation companies indicates that it is possible to raise funds for forestry activities from the open market if the right incentives are provided to investors. This is not to

say that forestry investments would necessarily yield higher as compared to other avenues of investment but if the investors are assured of tax benefits, they would certainly like to invest in this sector.

The collective investment schemes mainly involve plantation activities on large areas of agriculture land. Due to land ceiling restrictions, many companies had used 'innovative' ways to acquire land for raising plantations, which did not provide clear security to investors.

There has been a debate regarding the treatment of incomes earned by the investors by participating in plantation schemes. Many of the schemes have claimed that the income would be exempt from tax under Section 10 (1) of the Income Tax Act since it is income earned from agriculture sources. However, the individuals investing in these schemes may not be genuine agriculturalists. Therefore, the government needs to provide clarification on this aspect.

Although it is true that several companies promised unrealistically high returns, it is quite likely that several investors would be willing to invest their money even if somewhat lower returns are offered if these are tax free (which was the major reason for the investor interest in these companies). Further, now that a regulatory framework has been suggested by SEBI, which will minimise chances of fraud and thus restore investor confidence to some extent, efforts may be made to remove some existing bottlenecks and promote the plantation activity by the private sector (see Section 8).

# Role of farmers: farm forestry

In recent years, farmers have emerged as important players within the forestry sector. It is estimated that currently half the wood supply in the country is coming from non-forest sources (GoI 1999). While the farmers in many parts of the country have been traditionally growing trees on farms to meet their subsistence needs, concerted official efforts to promote farm forestry on a large scale were started only about 20-25 years ago.

The origin of large-scale tree plantation on non-forest lands (private farm lands, village common lands and government wastelands) can be traced to the report of the National Commission on Agriculture (NCA), which was released in 1976. After the issuance of the NCA report, farm forestry and common land plantations were promoted in a big way by the government during the 1970s and 1980s. Farmers in several regions planted trees on a large scale. However, due to a variety of reasons (as described below), most farmers abandoned tree farming by the end of the 1980s. While constraints continue to hamper the revival and growth of farm forestry in most regions of the country, there are some regions where farm forestry either did not decline or has picked up subsequently. Two such regions – western *tarai* of Uttar Pradesh and coastal Andhra Pradesh were studied to understand the reasons for this and to determine the lessons that may be applicable to other parts of the country. The findings of the study are detailed in the sections below.



## 4.1 Farm forestry in the 1970s and 1980s<sup>1</sup>

The government's support for farm forestry started in the late 1970s as a result of the recommendations of the NCA. The NCA strongly recommended that a large-scale tree plantation programme on non-forest lands should be started, which later came to be known as the social forestry programme. It is to be noted that the NCA's main concern in promoting social forestry was to free government forests from the pressure of meeting subsistence needs of the community and instead make them available for raising high-yielding industrial plantations (termed 'production forestry' by the NCA).<sup>2</sup> Social forestry was a subsidiary activity to help achieve this goal. In order to free the forest lands for production forestry, it suggested that local communities' needs should be met by a social forestry programme on *non-forest* lands such as village commons, government wastelands and farm lands (GoI 1976) (see Box 4.1).

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1. Adapted from Saigal 1998

2. In its view, local communities' dependence on the forests was a major cause of forest destruction and a major obstacle for production forestry.

#### Box 4.1 Extract from the NCA report

“Free supply of forest produce to the rural population and their rights and privileges have brought destruction to the forest and so it is necessary to reverse the process. The rural people have not contributed much towards the maintenance or regeneration of the forests. Having over-exploited the resources, they cannot in all fairness expect that somebody else will take the trouble of providing them with forest produce free of charge... One of the principal objectives of social forestry is to make it possible to meet these needs in full from readily accessible areas and thereby *lighten the burden on production forestry* (emphasis added). Such needs should be met by farm forestry, extension forestry and by rehabilitating scrub forests and degraded forests” (Gol 1976).

After the release of the NCA report, government support for plantations on non-forest lands increased substantially. Many states also formulated special projects and obtained financial assistance from international aid agencies. A large investment was made in social forestry through these internationally funded projects. Between 1981-82 and 1985-86, projects totalling Rs. 9.9 billion were initiated in fourteen states (MoEF 1989, in Vira 1995) (see Table 4.1).

Initially, the main focus was on common land plantations and the farm forestry targets were kept modest. This was due to the belief among the planners that the farmers would plant only a few trees on the homesteads or on farm boundaries (Saxena and Ballabh 1995).

The farmers, however, adopted farm forestry enthusiastically, though they were not planting trees for meeting their fuelwood and fodder needs as initially believed by the planners; rather, they were producing wood for the market. The popularity of farm forestry in the 1980s can be gauged from the fact that over 9 billion trees were planted on private lands between 1980 and 1989 (Saxena and Ballabh 1995).

The acceptance of farm forestry, however, was not uniform throughout the country. Its popularity was confined to the regions characterised by commercial agriculture, largely in north-west India. It failed to take off in the subsistence agriculture oriented eastern states such as Orissa, Bihar, eastern Uttar Pradesh and Madhya Pradesh. Similarly, farmers in the semi-arid millet growing regions of Maharashtra, Andhra Pradesh, Tamil Nadu and Karnataka did not take to tree planting in a big way, except in the commercialised parts (Saxena and Ballabh 1995).<sup>3</sup>

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3. Saxena and Ballabh have defined commercialised and subsistence agriculture regions in India at a macro level. Most commercialised regions are the wheat and cash-crop growing regions of north-west India, the Mahanadi, Godavari, Krishna and Kaveri deltas and other areas of intensive irrigation development as are found in the lowlands of Gujarat, Maharashtra and Tamil Nadu. Subsistence regions include the paddy-growing eastern India, the Himalayan uplands, other mountains and hills, the Chotanagpur plateau in south Bihar, much of the Deccan plateau and almost all tribal and heavily forested districts of central India (Saxena and Ballabh 1995).

**Table 4.1 Details of externally aided social forestry projects started between 1981-82 and 1985-86**  
(and two follow up projects started in Orissa and Tamil Nadu in 1988-89)

State	Donor	Period	Farm forestry (hectares)	Farm forestry (%)	Common land plantations (hectares)	Common land plantations (%)
Tamil Nadu	SIDA	81-82 to 87-88	85,165	37.94	139,330	62.06
West Bengal	WB	81-82 to 89-90	52,000	55.91	41,000	44.09
Haryana	WB/ DANIDA	82-83 to 89-90	30,000	44.78	37,000	55.22
Jammu & Kashmir	WB/ DANIDA	82-83 to 89-90	19,000	43.18	25,000	56.82
Maharashtra	USAID	82-83 to 89-90	44,035	54.36	36,965	45.64
Andhra Pradesh	CIDA	83-84 to 89-90	108,100	71.72	42,625	28.28
Karnataka	WB/ ODA	83-84 to 87-88	120,500	80.60	29,000	19.40
Orissa	SIDA	83-84 to 87-88	26,500	31.74	57,000	68.26
Bihar	SIDA	85-86 to 90-91	71,750	42.66	96,450	57.34
Gujarat	WB/ USAID	85-86 to 89-90	230,500	73.55	82,900	26.45
Himachal Pradesh	WB/ USAID	85-86 to 89-90	66,838	59.23	46,000	40.77
Kerala	WB	85-86 to 89-90	69,200	81.13	16,100	18.87
Rajasthan	WB/ USAID	85-86 to 89-90	91,500	75.75	29,300	24.25
Uttar Pradesh	WB/ USAID	85-86 to 89-90	147,210	90.90	14,740	9.10
Orissa	SIDA	88-89 to 92-93	62,000	46.13	72,400	53.87
Tamil Nadu	SIDA	88-89 to 92-93	18,000	22.97	60,380	77.03
<b>All</b>			<b>1,242,298</b>	<b>60</b>	<b>826,190</b>	<b>40</b>

Source: MoEF 1989, in Vira 1995  
**Abbreviations:** SIDA: Swedish International Development Authority; WB: The World Bank; DANIDA: Danish International Development Agency; USAID: United States Agency for International Development; CIDA: Canadian International Development Agency; ODA: Overseas Development Administration (UK)

### 4.1.1 The initial success

In the late 1970s and early 1980s, farm forestry became quite popular with the farmers of commercialised agriculture regions. Most farmers planted commercial species for sale in the market. Eucalyptus was the main species in the north-western region comprising of Gujarat, Punjab, Haryana and western Uttar Pradesh (Pathak 1994). In the southern states eucalyptus, casuarina and *babool* (*Acacia nilotica*) were the major species. On the whole, however, eucalyptus was by far the most popular species.

The FD reinforced the farmers' view about the profitability of tree planting by launching propaganda through billboards and radio. The extension workers stressed this to achieve their targets (Pathak 1994). Several incentives such as free or subsidised seedlings and soft loans were also provided to the farmers.<sup>4</sup>

The response of the farmers was overwhelming and farm forestry targets were exceeded in most states. In Gujarat, 695.6 million saplings were distributed between 1980 and 1985 against a target of 150 million (GoG n.d., in Pathak 1994). Similarly, in Uttar Pradesh over 350 million seedlings were distributed during the project period against an initial target of a mere 8 million (World Bank 1989, in Rao *et al* 1992).

### 4.1.2 Decline of farm forestry

The success of farm forestry, even in commercialised areas, was short-lived. Farmers began to abandon it by the mid-1980s as they did not get the kind of returns they were expecting (Saxena and Ballabh 1995).<sup>5</sup> A study covering 45 farmers who planted trees on their lands in Gujarat showed that only nine made relative profit, whilst the remainder would have been better off sticking to agriculture (Wilson and Trivedi 1987, in Saxena and Ballabh 1995). Punjab farmers were unable to obtain even Rs. 15 for a seven to eight year old tree, whereas the FD had earlier hinted at a price of Rs. 100 (Das 1988, in Saxena and Ballabh 1995).

This led to a rapid decline in new plantations by the farmers. In Gujarat, eucalyptus seedling distribution fell from a peak of 134 million in 1984 to only 12 million in 1988 (GoG 1989, in Saxena and Ballabh 1995). Similarly, in Haryana, the distribution of seedlings fell from a peak of 43 million in 1984 to a mere 4 million in 1988 (*Indian Express* 1 November 1988, in Saxena and Ballabh 1995). A similar decline was also observed in Punjab (Kapur 1991).

### 4.1.3 Reasons for the decline

#### Inappropriate silviculture

The farmers were poorly advised regarding silvicultural methods. Trees were planted at a close spacing and were harvested after 4-6 years (Saxena and Ballabh 1995). This led to very poor and small dimension output that was not

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4. Bank loans for eight years were available in Punjab with an interest rate of 10% for small farmers and 12.5% for other farmers (Kapur 1991).

5. Saxena and Ballabh (1995) cite 1986 as the watershed year after which farm forestry declined.

suitable as timber and often only usable as fuelwood (Athreya 1989, in Saxena and Ballabh 1995; IMRB 1989, in Saxena and Ballabh 1995). The FD encouraged farmers to plant with close spacing, as its objective was to increase fuelwood production for which close spacing was ideal. Another reason for promoting high density plantations were the huge targets FD officials were given after the initial success of farm forestry (Saxena and Ballabh 1995). The quality of seedlings raised hastily in bulk by the FD for supplying farmers was also poor (World Bank 1988, in Saxena and Ballabh 1995; Arnold *et al* 1987, in Saxena and Ballabh 1995). The farmers also lacked experience of plantation forestry and believed that simply planting trees was enough. They neglected important silvicultural operations like soil working and proper weeding leading to poor yields and low quality product (Arnold *et al* 1989, in Saxena and Ballabh 1995).

## Marketing problems

### *Poles and timber*

The initial eucalyptus crop was sold as poles for which there was demand from the construction industry. The eucalyptus poles replaced teak poles (Patel 1987, in Pathak 1995) for erecting scaffolding and as roof supports (Saxena 1995, in Saxena and Ballabh 1995). The farmers who got their produce on to the market early got good returns. For instance, early producers in Punjab got Rs. 150 for a seven to eight year old tree (Das 1988, in Saxena and Ballabh 1995). This raised the expectations of other farmers. The market for poles, however, was quite limited (NCAER 1987, in Saxena and Ballabh 1995). It got saturated quickly and collapsed. In Gujarat, the price of eucalyptus poles of diameter range of 10-12 cm. crashed from Rs. 60 in 1986 to only Rs. 23 in 1988 (Bhattacharjee 1988, in Pathak 1994).

The eucalyptus crop grown at close spacing on very short rotation was not suitable for use as timber (Saxena and Ballabh 1995). Out of the projected 3 million m<sup>3</sup> of farm forestry wood output in Haryana during 1989-90, only 7% was thick enough to be used as timber (NCAER 1987, in Saxena and Ballabh 1995).

Even in the few cases in which the wood was of correct dimensions, other factors such as low density and unevenness reduced the farmers' returns. The traders also preferred to buy timber in bulk from government depots rather than to deal with a large number of scattered farmers. The timber available from the government depots was usually drier and there was scope for underhand deals with the government officials (Saxena 1995, in Saxena and Ballabh 1995). Thus, the farmers were at a disadvantage on this account.

### *Pulpwood*

The produce of farm forestry was suitable as pulpwood, but paper mills were getting a subsidised supply from the FD.<sup>6</sup> Therefore, no competitive market was available to farmers. Paper mills bought pulpwood from the farmers only if they could not get their full requirement from the FD (Saxena 1995, in Saxena and Ballabh 1995). The mills preferred to buy pulpwood from the FD as its supplies

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6. In this section, the term FD is used to denote all forest related government agencies including the Forest Corporation.

were much cheaper and available in bulk. For instance, in Uttar Pradesh, the FD supplied eucalyptus to paper mills at Rs. 140 per MT during 1983-86 while the market price was between Rs. 400 to 600 per MT. Thus a competitive market was not available to the farmers.

The farmers could not fully tap this market for three more reasons. Firstly, many paper and pulp mills in India are designed for bamboo rather than wood. Secondly, most of the mills are situated in areas near the forests.<sup>7</sup> As wood is a bulky commodity, transport costs made it uneconomical for these mills to purchase wood being produced in the commercialised agriculture areas largely in north-west India (Saxena 1995, in Saxena and Ballabh 1995). Thirdly, paper mills had been granted import concessions by the government and were getting cheap imports (Pathak 1995).

#### *Collapse of wood markets*

The combined effect of all these factors was to limit the market for the farmers and to depress the market price, which was often set by the subsidised supplies of the FD and cheap imports. The glut faced by the north-western wood markets lowered the prices even further. Gujarat hit a low in 1984, Haryana in 1986 and Uttar Pradesh in 1987 (Pathak 1995). The price of eucalyptus wood was down to Rs. 300 per MT in Gujarat during 1984 (Bhattacharjee 1988, in Pathak 1994). In the Yamuna Nagar market of Haryana, prices fell from Rs. 48 per quintal in 1987 to Rs. 28 per quintal in 1988 (Prabhakar 1988, in Pathak 1994).<sup>8</sup> In Punjab, the price came down from Rs. 600-700 per MT in 1978 to Rs. 250-350 per MT in 1988 (Khare and Rao 1991).

Consequently, many farmers were forced to sell their produce as fuelwood. Even in the fuelwood markets, farmers faced the problem of competition from fuelwood headloaders who were collecting fuelwood free from the forests or other public lands. It is virtually impossible for fuelwood producers to compete with fuelwood collectors, as the only investment made by the latter is their labour. Furthermore, eucalyptus is not a preferred fuelwood as it gives out a lot of smoke. A study in Rajasthan showed that eucalyptus fetched a 15% to 20% lower price than other fuelwood species (USAID 1990, in Saxena and Ballabh 1995).

#### **Disabling laws and policies**

The cumbersome laws and procedures concerning tree felling, transport and sale also played an important role in reducing farmers' returns from, and enthusiasm for, farm forestry.

There are several restrictions on felling of trees standing on private land. The nature of restrictions varies in terms of species, regions, type of land holding and end use (Pathak 1995).<sup>9</sup> The procedure of seeking permission for felling is

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7. There are only three paper mills in Uttar Pradesh and Haryana and none in Punjab (Saxena 1995).

8. 1 Quintal = 100 Kilograms.

9. In Rajasthan, for instance, no trees could be harvested other than for one's own use. Hence no transit passes (to transport timber) were issued by the FD (Mathur and Ghose 1991).



cumbersome and complicated. Permission is also required for transporting timber and every movement of timber has to be accompanied by a transit pass issued by a competent authority.

These rules are meant to safeguard the natural environment and to prevent pilferage from the government forests. In practice, however, they become sources of harassment and rent seeking by officials.<sup>10</sup> These act against the interest of the producers and bring in an element of uncertainty in the operation of sale transactions (Saxena and Ballabh 1995).

These irksome procedures and the resultant harassment of the producers affected farm forestry significantly. Even farmers with valid permits were often harassed by the police at road checkpoints on the pretext that either the permit was false or the quantity exceeded the amount indicated on the permit. This adversely affected the market of the farmers, as they could not take advantage of high prices prevailing in some other areas by transporting their produce there (Saxena 1995, in Saxena and Ballabh 1995).<sup>11</sup>

In the later years, several states lifted some of the restrictions on popular farm forestry species. Gujarat removed restrictions on eucalyptus and casuarina in 1984. Rajasthan, Uttar Pradesh, Tamil Nadu and Andhra Pradesh also relaxed regulations for the commercial species (Pathak 1994). To date, these procedures remain one of the main irritants for the farmers involved in tree planting in many parts of the country.

### **Loss of agricultural production**

Another factor that led the farmers to abandon farm forestry was the unanticipated loss in agricultural yields (Pathak 1995). There has been a lot of heated, often acrimonious, debate on the question of use of fast growing exotics in farm forestry. The antagonists claim that these species reduced moisture availability for agriculture crops and reduce yields significantly (Bandopadhyaya and Shiva 1985, in Pathak 1995; Ahmed 1989, in Saxena and Ballabh 1995). The proponents of fast growing exotics claim that species like eucalyptus are efficient water users if one considers the biomass output per unit of water consumed.

It appears that farmers were hoping to get some extra income by planting these trees on their farm boundaries but had not anticipated any loss in agriculture yields. Studies suggest that they started experiencing a drop in agricultural income from the third year onwards (see Figure 4.1).

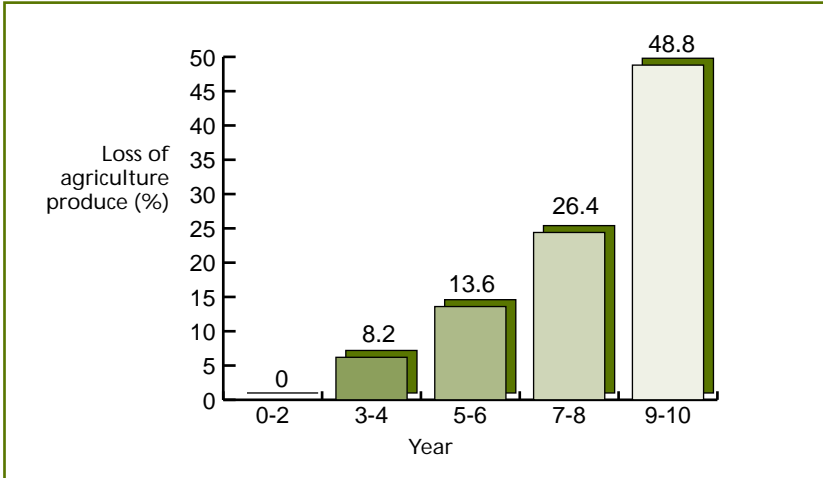
Although the argument about water use efficiency of fast growing exotics may be valid, the farmers seemed more concerned with their annual water budget rather than the net result over a period of years. As a result, many of them stopped planting trees.

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10. In Uttar Pradesh, for instance, the police have the power to apprehend a person for felling certain common species of trees standing on his or her land without permission (Pathak 1994).

11. Farmers in western Uttar Pradesh could not benefit from high prices in eastern Uttar Pradesh due to this problem (Saxena 1995).

Figure 4.1 Progressive drop in agriculture yield in Haryana due to eucalyptus



Source: Ahmed 1989, in Saxena and Ballabh 1995

## 4.2 Farm forestry: current scenario

While farm forestry experienced a general decline in the country towards the end of the 1980s, in some regions it either did not decline or has subsequently experienced an upswing in popularity with farmers. In recent years, wood-based industries have also started playing an important role in promoting tree planting among farmers in order to secure their raw material supplies.<sup>12</sup>

The regions where farm forestry is currently popular include: (1) Western Uttar Pradesh along with parts of Punjab and Haryana; (2) coastal Andhra Pradesh; (3) parts of Tamil Nadu; (4) parts of Karnataka; (5) Kerala; and (6) north Bihar areas.<sup>13</sup> Of these, two regions were selected for detailed study where, firstly, farm forestry was most popular and, secondly, farmers were supplying their produce in significant quantities to wood-based industries. These are the western *tarai* region of Uttar Pradesh and coastal Andhra Pradesh.

*Tarai* is the name given to the flat belt of the country running along the foot of the southernmost range of the Himalayan mountain system. In the western part of Uttar Pradesh *tarai* region, farmers have shown a most positive response to farm forestry and are growing poplar trees on a large scale. As well as the pioneering role played by Wimco in the promotion of poplar planting in the region, this region also has a presence of a number of other wood-based industries (such as plywood units), which have provided the farmers with a ready market for their produce.

12. The government has also continued to supply subsidised seedlings to the people. The available information indicates that from 1990-91 to 1997-98, the government agencies distributed a total of 9.309 billion seedlings (GoI 1999). However, figures regarding actual planting and survival are not readily available.

13. This is not an exhaustive list.

Figure 4.2 Location of Uddham Singh Nagar and Prakasam



Coastal Andhra Pradesh is another region of the country where farm forestry is very popular and has been taken up by a large number of farmers. This is reflected in the fact that Ongole, the headquarters of the Prakasam district in coastal Andhra Pradesh, has emerged as perhaps the largest pulpwood market in India. Wood-based industries from not only within Andhra Pradesh but also from several other states are procuring raw material from this area. The main species being grown are *subabul*, casuarina and eucalyptus.

A representative district was selected in each of the two regions, Uddham Singh Nagar district in the western *tarai* region of Uttar Pradesh and Prakasam district in coastal Andhra Pradesh, for an in-depth examination of the relevant issues (see Figure 4.2).<sup>14</sup>

#### 4.2.1 Farm forestry in Uddham Singh Nagar district

Uddham Singh Nagar district is located in the *tarai* tract at the foot of the Himalayan hill ranges, which is characterised by fertile soils, ample supply of water and a mild climate. It is one of the most agriculturally advanced areas of the state of Uttar Pradesh. Agriculture in the district is characterised by large land holdings,<sup>15</sup> secure means of irrigation,<sup>16</sup> cash crops, and enterprising farmers who have high risk bearing capacity.

A large number of the farmers in the district are planting poplar trees on their farms under an agroforestry model (see Box 4.2) and also on the farm boundaries. Poplar (especially two clones called G3 and G48) was introduced in the area in the mid 1980s by Wimco.

##### Box 4.2 Poplar agroforestry model

In block plantations, poplar trees are planted at a wide spacing to allow intercropping of agriculture crops. The most common spacing adopted is 5m x 4m and the general rotation period is six years. Typically, poplar ETPs are planted in January-February and a crop of sugarcane is raised as an inter-crop. In the next year, a second sugarcane crop is raised through *ratoons*. After this sugarcane is discontinued due to increasing shade of trees during summer months. From the third year onwards, farmers shift to growing crops in the *rabi* (winter) season alone. The most preferred *rabi* crop is wheat. Most farmers do not take any crop during the summer season from the third year onwards.

Initially, most of the ETPs were supplied by Wimco or the FD. However, over the years, a large number of private poplar nurseries have come up in the district. These private nurseries have contributed significantly to the growth of farm forestry by greatly enhancing the access (physical as well as financial) of

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14. Uddham Singh Nagar is now part of Uttaranchal state, which was carved out of Uttar Pradesh in November 2000.

15. Average land holding size in district Uddham Singh is 1.87 hectares as compared to only 0.93 hectare in the state of Uttar Pradesh (CMIE 1994).

16. About 96.5% of the net agriculture area in the district had irrigation facilities in 1998-99 (district records).

the farmers to ETPs. These nurseries have not only made the ETPs available at the farmers' doorstep but also made them extremely affordable even for smaller farmers. For instance, while Wimco charges Rs. 12 to 18 per ETP, these nurseries supply them at rates ranging from Rs. 5 to Rs. 8 per ETP. These nurseries are able to supply ETPs at such low rates as, unlike Wimco, they have not invested any money in research and development and are simply multiplying the clones developed by Wimco, FD and others (see Section 3.1.2).

The popularity of poplar farming can be gauged from the fact that around 30,000 acres in Uttar Pradesh, 17,500 acres in Punjab and 13,000 acres in Haryana (total 60,500 acres) are being planted with poplars annually (Chandra 2000).

In Uddham Singh Nagar district, it is estimated that 0.5-0.7 million ETPs have been planted in the year 2000, which translates to about 2,500 to 3,500 acres of potential plantings (Joshi 2000).

### **Pattern of spread/ planting pattern**

Farm forestry is not uniformly popular throughout the district. The differences in the spread of farm forestry in various parts of the district are due to factors such as soil and moisture conditions, land-holding size, ethnic composition, remoteness and so on. The pattern of planting adopted by farmers also varies according to the economic status/ land holding size. While the large and medium farmers combine block plantation and boundary plantation, the small and marginal farmers essentially confine themselves to boundary plantation.



### **Markets and marketing arrangements**

The tree harvesting and transport rules have been simplified in the state in recent years, which has facilitated the growth of farm forestry. In the case of several farm forestry species, including poplar and eucalyptus, no felling permit is needed. There is no need for a transit permit (for transporting wood) where there is no reserve forest in the district. However, as there is some reserve forest in the Uddham Singh Nagar district, a transit permit is required here.

In the initial years, the main market for the poplar wood produced in the area was provided by Wimco through buy-back agreements with the farmers (see Box 3.3, Section 3). In the mid-1980s, however, a number of plywood and plyboard factories were established locally and these became the major purchasers of poplar wood grown in the area. Currently, these plywood and plyboard factories along with sawmills that produce sawn strips for flush doors etc. are the main markets for poplar wood produced on farm lands. Wimco is no longer the main market for poplar as it gets the bulk of its raw material from government plantations. There are about fifteen plywood and plyboard units operating in the area. In addition, there are a number of sawmills, especially in the nearby Rampur town. Some of the wood is also sent to Yamuna Nagar in Haryana, which is a major market for farm forestry produce in north India.

The preferred system is sale of standing trees to middlemen, who then harvest the trees and cart them off to the industries or, at times, to the wood market in Rampur. Sometimes, large farmers harvest trees on their own and take them directly to industries or wood markets at Rampur or Yamuna Nagar. The bulk of the wood sale, however, takes place through middlemen.

### Price trends

While the price of poplar wood had been increasing steadily over the years, it declined sharply in 1998 and again in 2000 (see Table 4.2).

Year	Rate of poplar wood	
	Oversize (girth >90 cm.)	Undersize (girth 30-90 cm.)
1990 - 93	100 -150	45-50
1994 - 95	200 -250	-
1996 - 97	450 -480	-
1998	340 -385	190-225
1999	385	210-225
2000	280-310	165

Source: Timber trader in Rampur



The sharp decline in the price of poplar wood since 1998 can be attributed to a number of factors. The prices in the year before the crash had reportedly risen sharply due to a gap in planting of poplar during 1992-93 and harvesting of immature trees by several farmers in the earlier years to pay off their bank loans. Consequently, very little oversized material entered the market during 1997 leading to sharp increase in the prices.

In 1998, however, the government lifted the ban on felling of mango trees and a large number of old mango orchards were felled by the farmers. The supply of large quantities of mango wood in the market depressed poplar prices, as mango is also a good wood for making plywood, plyboard and packing cases. This ban was re-imposed in 1999.

Another reason for the fall in prices in 1998 stemmed from the closure of several sawmills as a result of a Supreme Court judgement, which reduced the demand for poplar wood.

Apart from these reasons, there are two other general reasons for the decline in price of poplar wood in recent years:

- While the supply of poplar wood has been increasing steadily, the demand from the plywood/ plyboard industry has either stagnated or has started falling in recent years. Plywood units in the region have started facing stiff competition from imports and consequently their sales have dropped. At the



Photo: Sushil Salgal

Poplar log being peeled in a local plywood factory in Uddham Singh Nagar

same time, it has also become easier for wood-based industries to import cheaper raw material from outside India. These have also contributed to the lowering of demand for poplar wood and a consequent slump in its price.

- The state run Forest Corporation supplies large quantities of wood to large wood-based industries of the area thereby reducing the demand for farm grown wood. For instance, in 1998-99 Wimco got 98% of its supplies from the Forest Corporation and bought only 2% of its requirements from the farmers. During the last four years, on average, Wimco has got poplar wood from the Forest Corporation at only about 83% of the rate in the open market (Wimco records).

### Future trends

The future of farm forestry in the district and the region will mainly depend on the trends in local wood markets, especially that of poplar. Farmers of the area are going to continue with poplar farming only if they are able to get reasonable returns.

Another factor that is likely to affect the future of farm forestry is the performance of different poplar clones. Due to lack of genetic variability, it is inevitable that sooner or later different clones will become susceptible to diseases. Already, out of two initial clones – G3 and G48 – one (G3) has become susceptible to a fungal disease and farmers have stopped planting it. Similarly, in the future other existing clones are also likely to become susceptible to diseases. Thus, the future of farm forestry will also depend on development of new clones of poplar on a regular basis.

Wimco is likely to play an important role in this regard. It is planning now to devote its resources mostly to research and development and reduce its extension activities as farmers of the area have now become well-versed with the technical aspects of raising poplar trees. The FD is also likely to develop new clones through its research and development facilities. However, in this connection, one issue that needs to be tackled is that of intellectual property rights. Currently, Wimco faces tough competition from private nurseries, which multiply the clones developed by Wimco and sell them at much lower rates affecting returns to Wimco. Mechanisms such as patents and registration of poplar nurseries would need to be seriously considered to enable Wimco and other private sector companies to play a meaningful role in forestry research and development (see Section 8).<sup>17</sup>

#### 4.2.2 Farm forestry in Prakasam district

Prakasam is a coastal district of Andhra Pradesh. It is a drought prone district with an average rainfall of only 752 mm. A significant proportion of the soils in the district (especially its eastern half) are highly saline and alkaline. At several places, the groundwater is also saline and unfit for irrigation or human consumption.

Agriculture is the main land use in the district covering about two-fifths of the total geographical area. About two-thirds of the agriculture in the district is rainfed. Farmers are quite enterprising and a number of cash crops such as tobacco, cotton, chillies and paddy are widely cultivated in the district.

Farm forestry is currently very popular with three main species being grown: *subabul*, casuarina and eucalyptus. The first tree species to be grown on a large scale in the district was casuarina, which has been cultivated by the farmers for several decades. It was initially planted by the FD in the coastal shelterbelts. Many farmers found it to be more profitable than agriculture crops on the coastal sandy soils. They initially grew it for sale as poles and fuelwood but in later years the pulpwood market also developed.

The other two main farm forestry species – *subabul* and eucalyptus – have become popular only in the past 15-20 years. The spread of these two species can be directly linked to problems faced by farmers in the cultivation of alternative cash crops such as tobacco and cotton. The fluctuations in the tobacco markets and pest problems in cotton have played a critical role in forcing the farmers to shift to alternatives such as *subabul* and eucalyptus.

It is estimated that over 100,000 acres of farm land is under tree crops and the district is supplying between 0.65 to 0.7 million MT of pulpwood annually to different wood-based industries (FD n.d.a). The most popular tree species is

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17. The Government of India has taken a major step in this direction by passing the Protection of Plant Varieties and Farmers' Rights Act, 2001 (Act Number 53 of 2001). This Act got the President's assent in November 2001. Under this Act, an effective system of registering plant varieties and protecting breeders' rights is proposed (see Box 3.8).



*subabul*, which covers 54.3% of the area under farm forestry followed by casuarina (26.4%) and eucalyptus (19.3%). The current production of these species is estimated at around 0.38 million MT for *subabul*, 0.11 million MT for casuarina and 0.15 million MT for eucalyptus (FD n.d.a).

Companies such as ITC BPL and APPM have played an important role in promoting farm forestry in the district. The most important contribution of ITC BPL has been the development of high-yielding disease resistant clones of eucalyptus through intensive research and development, which are being supplied to farmers at commercial rates. These clones have productivity ranging from 20 to 44 m<sup>3</sup> per hectare per year under rainfed conditions as compared to only 6 to 10 m<sup>3</sup> per hectare per year for seed-route plantations (Lal 1999). So far, 516 hectares of the clonal eucalyptus plantations have been raised in the district.

APPM is encouraging farm forestry through supply of casuarina and *subabul* seedlings to farmers at heavily subsidised rates. In Prakasam district, three to four million seedlings of *subabul* have been distributed annually since 1992 when APPM began its operations in the district (Brahmanudu 2000).<sup>18</sup>

### **Pattern of spread/planting pattern**

Farm forestry is mostly restricted to the eastern part of the district; and distinct regions in the district have developed where one of the three species, i.e. *subabul*, eucalyptus or casuarina, is dominant.

Casuarina is grown on the sandy soils in the coastal areas as farmers find it more profitable than alternative agricultural crops. In the earlier years, casuarina was mainly grown for poles and fuelwood but these days it is mainly sold as pulpwood. *Subabul* and eucalyptus have become popular with farmers who were looking for alternatives to crops such as tobacco and cotton. These species are mainly grown in areas where soils have problems of salinity and alkalinity and irrigation facilities are limited.

Clonal eucalyptus is mostly planted by large, better-off farmers as the initial investment required for raising these plantations is high.<sup>19</sup> The cost of planting stock itself comes to around Rs. 15,000 per hectare. In addition, the clonal plantations need further investment on fertilisers, pesticides, ploughing, intercultivation and irrigation annually until the rotation age is reached. This high initial and recurring cost has put the plantation of clonal eucalyptus beyond the reach of the small and marginal farmers.

### **Markets and marketing arrangements**

In Prakasam district, there are no restrictions on felling and transport of *subabul*, eucalyptus and casuarina. These have been exempted from the purview of Andhra Pradesh Forest Produce Transit Rules, 1970. While casuarina was

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18. The FD is also distributing subsidised seedlings in large numbers to the farmers.

19. Clonal eucalyptus was introduced in the district in 1996.

exempted from the transit restrictions in the 1970s itself, *subabul* and eucalyptus were granted exemption in 1984. The farmers are only required to obtain a *cultivation certificate* from the Mandal Revenue Officer stating that the farmer has grown the farm forestry produce on the land cultivated by him. After obtaining the *cultivation certificate*, the farmer is free to sell his produce.

The main market for the farm forestry produce of the district is provided by wood-based industries that are procuring pulpwood from the district. Some of these are located within the state while others have their production facilities in other state.<sup>20</sup> It is estimated that at present between 0.65 to 0.7 million MT of wood worth around Rs. 560 million is procured annually by these companies from the district (FD n.d.a).

At present, these companies are purchasing the raw material through three systems: (1) procurement through suppliers; (2) direct purchase from farmers and (3) purchase from farmers through the Agriculture Market Committees (AMCs).

The supplier system was the most common system of procurement until 1999. Under this system, the companies enter into contracts with suppliers for providing a specified amount of raw material to the company at their depots or mill site within a given time period, say six months to one year. These suppliers, in turn, procure the pulpwood from farmers often through sub-suppliers. The companies preferred this system as, apart from administrative convenience, they had a tax advantage in purchasing through suppliers rather than directly from



Photo: Sushil Saigal

**A farmer's clonal eucalyptus plantation in Prakasam district, Andhra Pradesh. Clonal eucalyptus tends to be planted by better-off farmers as the initial investment for raising such plantations is high**

20. At present, the following companies are procuring wood from the district:

*Andhra Pradesh based companies*

1. Andhra Pradesh Paper Mills, Rajahmundry
2. Sirpur Paper Mills, Sirpur
3. AP Rayons, Kamalapuram
4. ITC Bhadrachalam Paperboards Limited, Sarapak
5. Nagarjuna Cement, Huzur Nagar

*Companies located outside Andhra Pradesh*

1. West Coast Paper Mills, Dandeli, Karnataka
2. JK Paper Mills, Rayagada, Orissa
3. Ballarpur Paper Mills, Ballarshah, Maharashtra
4. Orient Paper Mills, Amlai, Madhya Pradesh
5. Mahendra Pulp and Paper Limited, Vapi, Gujarat
6. BILT Sewa Unit, Jeypore, Orissa

the farmers. This was due to a provision in the Sales/ Purchase Tax rules according to which the rate of tax was 4% if the wood was purchased from a supplier registered with the Commercial Tax Department and 10% in cases where it was purchased from an unregistered supplier.<sup>21</sup> While all the companies' suppliers were registered, farmers were treated as unregistered suppliers and higher rate of tax was charged. This acted as a disincentive for the companies to purchase wood directly from the farmers.

Still, in some cases, the companies did directly purchase from the farmers and continue to do so. However, the total quantity procured directly from the farmers by the companies is insignificant.

The AMC system was introduced only in 1999 after agitation by the farmers following the sudden reduction of *subabul* prices in 1998-99. The rate for *subabul* wood fell from Rs. 910 per MT in 1996 to Rs. 740 per MT in 1999 (see Box 4.3). After an agreement was mediated between the farmers and procuring companies by the Chief Minister, *subabul*, casuarina and eucalyptus were declared as *Agricultural Produce* as per the provisions of the Andhra Pradesh (Agricultural Produce and Livestock) Markets Act, 1966. The government has also exempted purchasing companies from the payment of sale/ purchase tax in case they purchase wood of *subabul*, casuarina or eucalyptus from farmers through AMCs. So far only *subabul* (with bark) wood is being traded through AMCs as a price has been fixed only for this wood (Rs. 860 per MT) and not for others.

**Box 4.3 Collapse of subabul market**

Sirpur Paper Mills started procuring wood from the district in 1996 and as they badly needed wood, they offered a high rate of Rs. 910 per MT against the prevailing rate of around Rs. 850 per MT. However, subsequently they realised their mistake and asked their suppliers to lower the prices. They procured at lower rate the following year and by March 1999 their suppliers had reduced the procurement rate to Rs. 740 per MT.

The details of prices paid by the major purchasers of *subabul* at the local depots are given in the following table:

Name of paper mill	Procurement price per MT in different years (Rs.)			
	1995-96	1996-97	1997-98	1998-99
Andhra Pradesh Paper Mills	766 to 846	846 to 898	865 to 830	800
West Coast Paper Mills	840	830	820	810
Sirpur Paper Mills	No procurement	890 to 910	825 to 835	795 to 800 Lowest: 740 in March 1999

Source: FD, n.d.

21. The sale tax rate for unregistered dealers has now come down to 8% due to implementation of a uniform sale tax structure by different states.

## Future trends

The future of farm forestry in the district will mainly depend on (1) the state of the pulpwood market and (2) the economics of alternative crops such as tobacco and cotton. The farmers are likely to continue to raise tree crops if they get reasonable and assured returns. However, if they do not get adequate returns, they are likely to shift to other crops. This trend was clearly seen at the time of the crash of *subabul* prices when very few farmers raised new *subabul* plantations.

## 4.3 Discussion of findings from the two districts

### 4.3.1 Reasons for the popularity of farm forestry

#### Facilitative government policies

Facilitative government policies have played a crucial role in encouraging and sustaining farm forestry in both districts. These government policies have encouraged farm forestry in two ways: (1) by reduction or stoppage of raw material supplies to the wood-based industries from government forests and (2) through removal of legal and procedural bottlenecks in the way of tree farming. After the 1988 forest policy, several state governments including Uttar Pradesh and Andhra Pradesh, have reduced the supplies of raw material to industries from state forests. In both states, felling and transport of important farm forestry species has been made easy and paperwork has been reduced to the minimum. The Andhra Pradesh Government has further facilitated the growth of farm forestry by declaring *subabul*, eucalyptus and casuarina as 'agricultural produce' and abolishing sale/ purchase tax in case of purchase of wood by the paper mills from farmers through the AMCs. In the case of Prakasam district, the District Administration has also played an important facilitative role.

#### Commercialised agriculture and enterprising farmers

In both the districts, agriculture was already commercialised and farmers were already growing agriculture cash crops for sale in the market. For instance, farmers of Uddham Singh Nagar were growing sugarcane, wheat and paddy while those of Prakasam were growing tobacco, cotton and chillies before they adopted farm forestry. As farmers of these districts were already operating in the cash economy and understood the functioning of the market, it was easier for them to adopt commercial farm forestry.

The farmers in these districts are willing to try out new crops and combinations, if they feel that this is going to bring them higher returns on their investment. The enterprising nature of the farmers of Uddham Singh Nagar is evident from the case of mentha. A few years ago, mentha cultivation was taken up on a large scale by the farmers of the area as they could get good returns by sale of mentha oil. A number of farmers also established mentha oil distillation plants. However, they discontinued its cultivation as soon as the price of mentha oil crashed.



Photo: Sushil Salgal

Farmers in Prakasam are replacing tobacco (foreground) with clonal eucalyptus (background). The volatility of the tobacco market has encouraged farmers to opt for tree farming with a view to higher and more secure returns

Similarly, in Prakasam district when the tobacco market became very volatile and uncertain, many farmers shifted to other crops such as cotton. When these farmers found tree farming to be a better option, they adopted it. The efforts of the farmers in these areas have been directed essentially towards getting higher returns from their land and it is only due to this reason that they have adopted farm forestry. Thus, in the future, if farmers start getting increased returns from some other crop they will not hesitate to shift from farm forestry to that crop.

### **Climatic and edaphic factors**

The climatic and edaphic conditions of both the districts have played an important part in the spread of farm forestry there. In Uddham Singh Nagar, poplar farming would not have been possible if the area did not have fertile soils, good surface drainage, easy availability of irrigation and suitable climate. Poplar has very exacting requirements and all of these are fulfilled in Uddham Singh Nagar. Due to fertility of soils, farmers of the district have been able to raise poplar crops without sacrificing much of their agriculture crop, especially in the *rabi* (winter) season.

By contrast, in Prakasam district farmers took to tree farming because the climatic and edaphic conditions are such that the choice of crops available to the farmers is limited. Due to a combination of low rainfall, saline-alkaline soils, saline groundwater and lack of irrigation facilities, only a few agriculture crops such as tobacco or some trees can be raised by the farmers. Once farmers started facing problems in marketing tobacco, they shifted to tree crops such as *subabul* that can be raised on such refractory soils under low rainfall conditions

without much investment or care. Once *subabul* farming picked up in the area, several farmers who had wastelands on which they were not raising any crop also started tree cultivation on such lands.

### Higher profitability and lump sum money

The cost of production under conventional agriculture has increased considerably over the years because of increasing input costs (prices of fertilisers, diesel, pesticides etc.). The stagnating productivity levels and increasing input costs of certain agricultural products have made agriculture less lucrative to farmers in these districts. Farm forestry is lucrative to the farmers as it requires lower inputs and the profit margins are higher (see Box 4.4). Another major attraction for farmers is the lump sum income, which they get at the time of harvest. The farmers find it difficult to make small savings from the annual returns from agricultural crops and prefer the lump sum income from trees that can be used for some major family expense such as marriage, house construction, purchase of land or some durable asset such as a tractor or truck. Thus, farmers tend to view trees (especially those on farm bunds) as ‘insurance policies’, which can be used at times of need.

#### Box 4.4 Increased profitability under poplar

Approximate average net returns per acre from major cash crops:

Sugarcane: Rs. 15,000

Wheat: Rs. 5,000

Paddy: Rs. 8,000

Approximate returns from poplar (per acre):

Number of trees per acre: 200

Rotation: 6 years

Average expenditure over rotation: Rs. 10,000

Average net return: Rs. 1,50,000

Average return per year: Rs. 25,000

Average loss of agriculture income over rotation (loss of four years' paddy crop as well as loss in production of sugarcane and wheat): Rs. 47,625

Net benefit with poplar: Rs. 1,02,375

Net benefit per year: Rs. 17,062

Source: Primary survey

### Risks associated with alternative crops

Agricultural crops carry considerable risks, which, according to the farmers, have increased in recent years due to erratic rainfall and emergence of new pests. While a farmer cannot be very certain about the return he or she is going to get from the agriculture crop until he or she actually sells it (often rain during the harvest season either ruins the crop or reduces its grade significantly), tree crops are comparatively less risky. Firstly, trees are not so easily damaged and secondly these can be retained on the farm in case the market price falls. Even if

trees fall during a storm, the farmer can still get some money by selling the wood, whereas agricultural crops usually get completely damaged. Thus, farmers prefer to grow a combination of trees and agricultural crops – in other words a suite of low and high risk assets. The increasing risks (pest attacks/ climatic variations/ market crash) associated with the alternative agricultural crops have been instrumental in pushing the farmers towards more reliable and relatively less susceptible tree crops.<sup>22</sup> For example, the volatility of tobacco and chilli markets and pest problems in cotton were the main reasons that have forced the farmers in Prakasam to shift to relatively safer tree crops such as *subabul*. Similarly, high costs of inputs and uncertainty of production and marketing associated with agriculture crops such as paddy and sugarcane are the reasons why farmers in Uddham Singh Nagar have adopted farm forestry.

### **Availability of suitable tree species**

Availability of suitable fast growing tree species, that fitted in well with the local climatic/edaphic conditions and the cropping pattern, was an important reason for the adoption of farm forestry in both the districts.

Farmers of Uddham Singh Nagar adopted poplar as it fitted well with the local cropping pattern. The tree sheds all its leaves in winter enabling the farmer to raise a *rabi* (winter) crop such as wheat without much loss of yield. Further, it can be easily and rapidly multiplied through vegetative propagation methods. There is no need for special technology, equipment or infrastructure (mist chambers etc.). The tree cuttings root so easily under the local climatic conditions that the farmers are themselves able to prepare their nurseries from cuttings. If the multiplication had not been so easy, poplar farming may not have become so popular among the farmers of Uddham Singh Nagar. Similarly, *subabul* is popular in the Prakasam district as it is able to grow well under the harsh climatic and edaphic conditions prevailing in the district and needs no irrigation. It is also extremely easy to multiply and its plantations can be raised by farmers by using locally collected seeds or wildlings.

### **Research and development effort by private sector companies**

The research and development effort put in by the companies in developing suitable clones of tree species has played an important role in the promotion of farm forestry, especially in Uddham Singh Nagar. Even in Prakasam, eucalyptus farming has become more popular among large farmers after the introduction of 'Bhadrachalam clones' by ITC BPL. While higher productivity of clones as compared to seed route trees is important, other factors such as disease resistance, suitable morphology and phenology have also played a part in popularising tree farming.<sup>23</sup>

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22. While it is true that even tree crops, especially clonal ones, become susceptible to diseases over time, farmers consider these to be far less risky than agricultural crops.

23. For instance, while poplar trees were around for several years, they were not very popular with farmers as they did not shed all their leaves in winter. The new clones introduced by Wimco became more popular as these shed all their leaves in winter and time of leaf fall and re-emergence is such that farmers can take the *rabi* (winter) crop.

## **Demonstration effect/ extension efforts by the private sector**

Demonstration effect has played an important role in the popularisation of tree planting in both the districts studied. For instance, many farmers in both Uddham Singh Nagar and Praksam adopted tree farming after seeing other farmers in their neighbourhood earning profits from the sale of their tree harvest. Extension efforts made by the companies, which included setting up of various demonstration plots, offering free technical advice regarding the clones that would be best suited for their land, and educating farmers in the various aspects of tree planting and maintenance, have also been instrumental in the adoption of farm forestry in these districts.

## **Ready availability of markets and market infrastructure**

Ready availability of market for wood, owing to the presence of a number of wood-based industries in and around both districts, is also a major reason for the popularity of farm forestry. Many farmers in Uddham Singh Nagar initially planted poplars only because of the buy-back guarantee offered by Wimco. Similarly, the buy-back guarantee offered by ITC BPL prompted farmers in the Prakasam district to raise clonal eucalyptus plantations. Availability of market infrastructure such as presence of weighbridges, depots and market yards has also encouraged them to plant trees.

### **4.3.2 Planting pattern**

It has been observed that in general, most farmers plant trees only over a part of their land and use the rest of the land to grow agriculture crops due to (i) their desire to spread the risks and (ii) their need for cash income on an annual basis. However, the pattern of planting varies depending on the farmer's land holding size and economic status. Larger landowners generally opt for block plantations as their problems are not of subsistence or cash flow but often of labour shortage. They can afford to make the high initial investment in block plantations, forego agriculture yields and wait for several years to get the returns. On the other hand, small and marginal farmers usually limit themselves to boundary plantations or put only small parcels of their land under block plantations as they are unable to forego the food security and annual cash flow offered by agriculture. Further, they are unable to take risks due to fluctuations in the market prices of wood.

### **4.3.3 Market regulation**

Market related problems were observed in both Uddham Singh Nagar and Prakasam after a large number of farmers started growing trees. In Uddham Singh Nagar, the price of poplar (oversize) wood came down from Rs. 450-480 per quintal in 1997 to about Rs. 280-310 per quintal in 2000. In Prakasam district, the price of *subabul* (with bark) wood crashed from about Rs. 910 in 1996 to Rs. 740 in 1999. In both districts, the fall in prices led to a decline in fresh planting by the farmers. Some allegations regarding manipulation of prices and attempts to form cartels have also been levelled against the purchasers of



wood in both places. While the intervention by the government has stabilised the situation somewhat in Prakasam, no such initiative has been taken in Uddham Singh Nagar.

The benefits of a regulatory mechanism were seen in the Prakasam district where timely government intervention saved the *subabul* market from crashing in 1999. Although a mechanism for the trading of *subabul* (with bark) wood through AMCs has been put in place, it is only a first step. For instance, while the price of *subabul* (with bark) wood was fixed at Rs 860 per MT, there is no mechanism for periodical review. As this is not the minimum support price offered by the government (as is the case with agricultural crops), some people have questioned its validity. Their argument is that government cannot force the industries to purchase wood at a predetermined fixed rate as the markets for the end produce, such as paper, are not controlled.

#### 4.3.4 Impacts of farm forestry

The spread of farm forestry in an area is likely to have impacts beyond increased production of wood. These may include impacts on aspects such as local climate, ground water, agriculture, the dairy industry and so on. Some of these may be positive while others may be negative.

In both the districts studied, there has been some sort of controversy over these impacts. For instance, some farmers in Prakasam feel that growth of eucalyptus and *subabul* plantations have adversely affected the ground water resources. This is refuted by the ITC BPL officials who are promoting eucalyptus plantations. In Uddham Singh Nagar and other *tarai* areas, some sugar mill owners are opposing poplar on the grounds that the area under sugarcane has come down. A number of people also feel that eucalyptus adversely affects agriculture crops in the neighbouring plots.

#### 4.3.5 Corruption

Corruption is defined as the abuse of public office for private gain (World Bank 1997, in Hill 2000). It is widely acknowledged that there is widespread corruption in the Indian forestry sector, though much of it is 'petty' in nature (Hill 2000).<sup>24</sup> The issue of corruption came up strongly during the field visits, especially in Uttar Pradesh. Although it is an issue in general governance, its negative impact on farm forestry is often ignored by those planning change.

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24. Transparency International refers to corruption as 'petty' when the benefits are relatively small, though they may be large from the perspective of the individual. When the benefits are large at the national level, the corruption is termed as 'grand'.

## 4.4 Summary of findings on farm forestry

Farm forestry first became popular in the 1970s when the government aggressively promoted it following the NCA recommendations. Farmers in several parts of the country (especially commercialised agriculture areas) adopted it enthusiastically. However, the popularity of farm forestry declined sharply after the mid 1980s as the farmers did not get expected returns on their investments.

In recent years, farm forestry has staged a comeback and has become quite popular with farmers. While the popularity of farm forestry is limited to certain regions of the country only, its contribution towards meeting the demand for wood in the country is significant. It is estimated that Uddham Singh Nagar and Prakasham districts alone produce between 0.2-0.28 million MT and 0.65-0.7 million MT respectively of farm grown wood annually. In terms of value, it is estimated that wood worth Rs. 650 million and Rs. 560 million respectively is produced annually in Uddham Singh Nagar and Prakasham districts.<sup>25</sup> Thus, just two districts (or rather parts of these districts) are producing nearly a million MT of wood valued at over Rs. 1200 million annually. Overall, it is estimated that 50% of the wood supply in the country is currently coming from non-forest sources.

A facilitative policy environment is a necessary though not sufficient precondition for adoption of farm forestry by farmers. Cumbersome laws and procedures related to tree felling, transport and sale discourage farmers from taking up tree farming. While these restrictions have been imposed in many states with the objectives of preserving the environment and preventing pilferage from government forests, it is the *relaxation* of these restrictions that has helped in achieving these very objectives in many areas. Relaxation of restrictions encourages more farmers to plant trees, which in turn tends to reduce pressure on the government forests. For example, farmers of Uddham Singh Nagar and Prakasham districts are planting trees on a large scale because state governments have removed most restrictions on tree felling, transport and sale, and made the procedures extremely simple.

The other critical factor for the popularity of farm forestry has been the research and development effort of private sector companies. The main benefits of research and development have been the identification of locally suited species and development of high-yielding, disease resistant clones having other desirable qualities as well. The availability of suitable high-yielding clones of trees has made farm forestry popular with farmers who were looking for avenues for higher or more assured returns.

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25. The figures for Prakasham are based on FD data. The figures for Uddham Singh Nagar have been calculated based on an estimated current harvest of 2500 to 3500 acres of poplar annually. Productivity is assumed to be 80 MT per acre. It is assumed that half the produce is sold at 'oversize' rate of Rs. 3000 per MT while the remaining half is sold at 'undersize' rate of Rs. 1650 per MT.

The learning emerging from this study indicates that the availability of market and remunerative prices for farm forestry produce are likely to be major factors determining the future of farm forestry. The farmers' failure to get remunerative prices for their produce was the most significant factor that led to decline of farm forestry in several regions in the late 1980s. It has been observed that, in both the districts studied, farm forestry received setbacks in recent years mainly on account of the volatility of wood markets.

The farm forestry markets are affected by a number of factors including the government's policies e.g. those pertaining to raw material supplies to industries from forest lands and export and import of wood-based materials.

In some states, the government continues to supply raw material to industry from forest lands (although there has been a general decline in the supply of such raw material), which affects the market of the farmers. For example, major wood-based industries in Uttar Pradesh are still supplied raw material by the government from eucalyptus and poplar plantations raised on government forest lands. Often, the rate charged is also lower than the market rate (see Annex 8).

The import of wood and wood products is now virtually unregulated and customs duty on these has been substantially reduced (see Annex 7). While import of wood-based raw material has been liberalised and duties have been kept at the lowest level possible, the export of wood and wood products in the form of logs, timber, bark, pulp, charcoal etc. is banned. The low import duties on wood-based raw material along with the ban on export work together to depress domestic prices and thus adversely affects the domestic producers.

Farm forestry is at a critical juncture in its development. Farmers of certain regions in the country have demonstrated that, given the right policy environment and incentives, they are willing and capable of raising tree crops on a large scale. However, available experience indicates that certain policy interventions are needed to sustain farm forestry in these regions and to promote it in others (see Section 8). Currently there appears to be no comprehensive policy on this issue. Although the National Forest Policy does mention that forest-based industries should be encouraged to procure their raw material from farmers, the thrust of the policy seems to be encouraging tree planting by farmers for environmental reasons or for meeting their subsistence needs.<sup>26</sup> There is a need to acknowledge the commercial nature of much of farm forestry and the potential for this to provide significant improvements to local livelihoods. If a comprehensive policy is developed to address various issues related to farm forestry and to sustain and further promote it, it is likely that within a relatively short period farmers could meet the entire industrial wood needs of the country.

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26. This focus of the policy is clear from a clause in the paragraph dealing with farm forestry that stresses the need for regulation of tree felling on private holdings.



Photo: Sushil Salgal

A billboard and a sample of saplings advertising a local poplar nursery. A large number of private poplar nurseries have emerged in the *Tarai* in recent years, contributing to the growth of farm forestry by greatly enhancing farmers' access to saplings

# The role of communities: Joint Forest Management

Local communities are important stakeholders in India's forests. It is estimated that about 15% of the country's population resides in the close vicinity of forests and derives much of its subsistence needs from them. While local communities are important users of forest produce everywhere, in some parts they have traditionally played an active role in the protection and management of forests. In some areas, such as the north-eastern states and Uttaranchal, their role is officially delineated; in others, such as parts of Orissa and Jharkhand, they have been doing so on their own, without any official support or approval.

With the advent of the JFM programme, local communities have formally started playing a greater role in the protection and regeneration of government forests (especially degraded ones) in most parts of the country.

While the meeting of subsistence needs is a well accepted objective of JFM, a major question being raised is whether forests under JFM can also be managed for commercial production. In an attempt to answer this, the current production from forests in two states where harvests have started, Haryana and West Bengal, was analysed.<sup>1</sup> On the basis of the experience of these states, an assessment is made of the potential of these forests to meet commercial needs in the future. In order to put this in perspective, the progress that JFM has made in the country and in the two study states is presented first.

## 5.1 Progress of JFM

### 5.1.1 National level

As has been presented in Section 2.1.1, twenty-seven state governments have so far issued enabling orders/ resolutions permitting JFM partnerships between FDs and organised groups of local people. Over 18% of the recorded forest area is already under JFM. However, there have been no independent comprehensive estimates of the actual coverage at the field level and the effectiveness of the institutions that have been formed.

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1. Field work was done in the Yamuna Nagar Forest Division in Haryana and in Midnapur and Bankura Forest Divisions in south West Bengal.



## 5.1.2 Haryana

Having begun in two villages of the state, Sukhomajri and Nada,<sup>2</sup> the JFM programme today extends to many villages in the Morni-Pinjore and Yamuna Nagar Forest Divisions in the Shivalik region of Haryana. Started without any formal policy backing from the state government, the programme received formal recognition when the state government issued a memorandum in June 1990 (amended in 1998) laying down the policy for JFM in the state. Subsequently, the FD has also undertaken a project on rehabilitation of common lands, on similar principles, in the Aravalli hill areas.

Societies formed in the Shivalik hills are called Hill Resource Management Societies (HRMSs) and the operational area of these societies are government forests. In the Aravalli hills these are called Village Forest Committees and their operational area is common lands.<sup>3</sup> Latest figures obtained from the state indicate that there are 471 HRMSs and Village Forest Committees in the state protecting and managing around 66,000 hectares of forest and common lands.

In order to get a better understanding of the progress of JFM in the state, one forest division was studied in detail: the erstwhile Ambala Forest Division (parts of which are now reconstituted into the Yamuna Nagar Forest Division), whose Working Plan (1986-87 to 2000-01) was obtained from the FD.<sup>4</sup> Looking at the kinds of areas that have been brought under JFM in this division and after discussions with officials at the field level, it can be concluded that while the state JFM policy does not preclude JFM in good forests,<sup>5</sup> in practice only degraded areas are brought under JFM. For instance, 93.8% of the area brought under JFM in the Yamuna Nagar Division belongs to the Watershed Protection Working Circle (WC), or to the most degraded and ecologically fragile area of the state forests.<sup>6</sup>



## 5.1.3 West Bengal

West Bengal is one of the pioneering states where experiments with JFM were started in the seventies. The first experiment took place in the Arabari Range in the Midnapur district. The encouraging results of this experiment laid the foundation of the JFM programme in the state and the state government issued the JFM Order in 1989 for the south West Bengal region. In 1991, the state government issued three more orders to extend JFM to North Bengal plains, Darjeeling Gorkha Hill Council areas and Sunderbans.

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2. Located in the Morni-Pinjore Forest Division (District Panchkula).

3. The most common term used for JFM groups in the country is Forest Protection Committees or FPCs.

4. The Ambala Forest Division has a total area of 13,932 hectares. Of this, 4,836 hectares (34.7%) have been brought under JFM. Nine HRMSs have been formed for the management of these lands (information pertains to the time of field work).

5. As per state notification No. 3799 FTI 98/ 13358, dated 29.6.98. Even the earlier state order of 13.6.90 did not restrict JFM to only degraded areas. It only stipulated that 'The basic philosophy underlying the proposed policy is to link the economic interests of villagers living adjacent to forest areas with sustainable management of those areas'.

6. The remaining area belongs to the *Khair* WC but has also been identified as that needing plantations in order to restore productivity.

Presently, the state has about 3,545 FPCs protecting a forest area of 488,095 hectares. The south West Bengal region accounts for approximately two-thirds of the area brought under protection in the entire state with the maximum concentration of FPCs in the districts of Bankura, Midnapur and Purulia. Mainly degraded forest areas in the state have been brought under JFM.

## 5.2 Current commercial production from JFM

### 5.2.1 Haryana

The main products extracted from the forest areas under JFM include *bhabbar* grass, fodder grasses and bamboo. Of these, *bhabbar* is the only commercial raw material (for the paper industry) from the JFM areas. In small pockets, some other products like *tendu* leaves for *bidi* making, *sarkanda* (*Saccharum munja*), herbs, fruits like *harra* (*Terminalia chebula*), *behera* (*Terminalia belerica*), *amla* (*Emblica officinalis*), etc. are also extracted. However, most of these are specific to some areas and, at the state level, there are no estimates on extraction and revenue earned from them.

*Bhabbar* grass is commercially valuable as it is an excellent raw material for paper pulp and is also used in rope making by the local village communities. Trends in *bhabbar* production, harvesting and sale in the state (see Annex 9 for the output of *bhabbar* from JFM areas in Yamuna Nagar Division) bring out the following important points:



Photo: Jeff Campbell

Hill Resource Management Society meeting in Haryana. HRMSs can choose to take *bhabbar* grass on lease, which is then free to harvest, for subsistence or commercial use. However, many HRMSs have seen yields decrease under current forest management practices

- Of the 15 forest areas in Yamuna Nagar Division where 15 HRMSs have been constituted, *bhabbar* has been taken on lease only by six HRMSs.<sup>7</sup> In the remaining areas, the *bhabbar* is being sold through open auction. Various studies and reports (Sarin 1996; TERI 1999; Mahapatra 1998) indicate a range of reasons for this trend. Among the important reasons are declining yields, increasing extraction costs and declining markets and market prices, with no corresponding decline in lease costs.
- Although the underlying philosophy of JFM in the state is based on giving the village people a major share in the increased production, the FD does not maintain any production records once the forest is given on lease to the HRMSs. There is some indication that grass yields have actually declined after a few years of protection. According to Sarin (1996), in a meeting of 17 HRMSs of Pinjore Range, held in 1991, most HRMSs pointed out that their *bhabbar* yields were decreasing rather than increasing, largely due to proliferation of *Lantana camara* weed and the shade effect of growing trees. This was also mentioned during the field visits made to the area.

Based on field observations and discussions, it can be concluded that:

- Under the current forest management practices, the yield of *bhabbar* starts declining within a few years of initiating protection;
- Under the current lease price policy, not many HRMSs are interested in taking up the *bhabbar* lease (and, by the same logic, will not be interested in taking fodder grass lease either);
- Under the current arrangement for sharing of benefits between the HRMSs and the FD, if the HRMS does not take the lease (*bhabbar* or fodder), there is little incentive in the short run for the HRMS to continue in protection efforts to improve productivity of these forest lands.<sup>8</sup> Clearly, this would adversely impact on the sustainable management of forest areas.

## 5.2.2 West Bengal

In West Bengal, and more specifically south West Bengal, where harvests have started, the JFM forests yield a wide variety of produce. Amongst the woody produce are poles, posts, cogging sleepers, fuelwood, pulpwood and timber. NTFPs include *sal* leaves, *sal* seeds, cashew nuts, *tendu* leaves, mushroom, *tussar*, resins, lac, gum, *mahua*, herbal medicinal plants, etc.

7. On payment of a certain amount of money, HRMSs can take on lease the *bhabbar* grass, which they are then free to harvest (according to prescribed norms) for local consumption or sale to outsiders. Taking the grass on lease also means that the HRMS has to protect the area in order to ensure that the grass grows well.

8. In most HRMSs in Haryana, the FD has made water harvesting structures to provide water for irrigation to the community. This would then remain the only incentive for protection of forests. However, many studies have brought out that the water harvesting structures in many HRMSs are non-functional or benefit very few members of HRMSs. In such cases, the future of JFM is quite uncertain.



## Woody produce

Information about production and harvests in south West Bengal (see Annex 10 for details) reveals that:

- The total area that is harvested annually is less than one-fifth of the full potential of annual harvesting.<sup>9</sup> The main reason for this is the inability of the FD to sell all the products that are harvested from the JFM areas. The markets are limited and the enhanced production is depressing the prices of the produce in the market. This has major implications for the FPCs who are unable to get adequate returns.
- The maximum production, in terms of quantity, from the area is of cogging sleepers<sup>10</sup> followed by poles and posts. Pulpwood and timber are harvested in relatively small amounts, while the harvest of fuelwood is substantial. Nearly 95% of the timber harvested is from plantation areas.

## Non-timber forest produce

The production, collection and marketing of NTFPs is, to a large extent, a function of whether the NTFPs are nationalised or not. In West Bengal, *sal* seeds and *tendu* leaves come under the category of nationalised NTFPs i.e. the government has a monopoly over their procurement and trade. The collectors can sell these only to a designated agency, which is the “Large Scale Adivasi Multi-Purpose Cooperative Society” or LAMPS in the case of West Bengal. The procurement rate is decided by LAMPS. The LAMPS sell the NTFPs so collected and the profits are shared with the collectors who are members of the LAMPS. Production data regarding nationalised NTFPs is available at the state level and is presented in Table 5.1 (along with some data available on non-nationalised NTFPs). However, this data needs to be treated with some caution, because not all the *sal* seed and *tendu* leaves collected by the village people are sold to the LAMPS.<sup>11</sup> Hence, official data on production figures is likely to be much less than actual production.

There is generally a lack of data on the levels of production of non-nationalised NTFPs in the state as a whole. This is mainly because these products are sold through unorganised markets at a local level and cover a wide range of produce that is bought by a very large number of buyers.

Despite the lack of aggregate data regarding the non-nationalised NTFPs, a number of studies have been carried out in the state that bring out the range and extent of NTFP collection as well as their importance and relevance to the

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9. The total area harvested in 1996-97 in south West Bengal was 4673 hectares, which was less than one-fifth of the full potential of annual harvesting, at an average rotation of about 12 years, in the proportion of 2:1 of coppice *sal* and plantations (Guhathakurta and Roy 2000).

10. The production of cogging sleepers is totally dependent on the demand that is received for these from the mining companies.

11. The informal market pays the people the market rate for the *sal* seed/ *tendu* leaves collected, which is always higher than the rate paid by the LAMPS. The people, therefore, prefer to sell to illegal traders (TERI 1999; ETS 2000).

**Table 5.1 Output of NTFPs in forest areas**

Year	<i>Sal</i> seeds (MT)	<i>Tendu</i> leaves (MT)	Honey (Quintals) <sup>12</sup>	Wax (Quintals)
1989-90	1189	2251	42	2
1990-91	345	2080	148	9
1991-92	1885	1900	387	24
1992-93	1488	2100	509	36
1993-94	1892	1928	682	38
1994-95	1436	1250	380	20
1995-96	865	1455	324	19
1996-97	290	1033	447	27

Source: State report on West Bengal Forests 1989-90 and 1996-97 in TERI 1999.

tribals and the poor in the state. Many of these also bring out the problems associated with the production and marketing of NTFPs. Some of the more important findings are presented here:

- A survey conducted in the forests under JFM in Midnapur district revealed the immense potential of these forests to meet the subsistence and cash needs of the local communities (Malhotra *et al* 1991, in Guhathakurta and Roy 2000). A total of 214 wild plant species were observed in the regenerating *sal* forests. Of these, 155 (72.43%) were being used by the local communities for different purposes. It was found that NTFPs contribute 22% and 16% of the income of tribal and caste families respectively. It has been estimated that the potential earnings from NTFPs from one hectare of regenerated *sal* forest comes to about Rs 16,000 over a period of ten years (Palit 1992, in ETS 2000). This is likely to be several times higher than the income from the community's 25% share in the timber revenues available after ten years.
- NTFPs from naturally regenerating forests usually yield more income to community members than monoculture plantations.
- NTFPs are more attractive to community groups than clear felling on 8-12 year rotation as these not only yield higher returns than timber but are also available in good quantities soon after forest protection efforts start. The benefits from NTFPs also tend to flow disproportionately to low income families in general and women and children in particular.

### 5.2.3 Lessons from current commercial production

The nature of commercial production from areas brought under JFM, at present, seems no different from a position in which the forest areas were adequately protected and managed by the FD itself. Haryana continues to produce and sell *bhabbar* grass although there are indications that the quantities harvested are reducing over time because of closing canopy cover.

12. 1 Quintal = 100 kgs.



Photo: Jeff Campbell

NTFPs collected from JFM forests in West Bengal. It has been estimated that the potential earnings from NTFPs are likely to be several times higher than the income from the community's 25% share in timber revenues

Clearly, the change in the current commercial harvests is happening not because the forests are being managed to meet subsistence needs, or because the produce is being used for consumption. Neither is the change happening because of any man-made changes in species composition through plantation of new species, or a transformation in the management prescriptions. Rather, this is happening because of more effective protection provided to these forests. However, this is not to say that JFM will not induce changes because, with JFM, local people have a greater say in the management of the forest areas. Any change in management prescriptions (based on microplans) might well result in a shift in the focus of harvests: from timber to NTFPs; from poles to fuelwood etc.

Another important factor that is seen to influence the current levels of commercial production as well as the involvement of the village communities in the management of the forests is the marketing of the produce. Both Haryana and West Bengal are facing marketing problems for the present product mix. Price figures as a major factor in limiting the demand for the produce. The last couple of decades have witnessed imposition of felling bans, cessation of subsidised raw material supplies to the industry, growth of private forestry and import liberalisation, among other things. All these have resulted in one of the following effects:

- closure/ decline of many forest based industries
- change in the raw material mix of the industry
- shift to alternative sources of supply (private/ captive forestry, imports, etc.)

This highlights the need to re-examine the demand-supply situation in the context of price and market conditions. The presumption that demand exists and will absorb all new supplies does not seem valid.

Thus, while current harvest trends are fashioned on traditional management principles, the various ecological, social, silvicultural, institutional and marketing issues that are coming to light might well exert considerable influence on shaping the nature and extent of commercial produce that is available in the future. It seems logical to conclude that similar factors will influence both current and future production in other states as well.

## 5.3 Potential of commercial production from JFM forests

In order to assess the potential of commercial production from JFM forests, five factors that seem to have played an important role in determining the current production levels in the two study states were examined.

- Site condition
- Growing stock of commercial species/ Productivity
- Potential for harvest
- Subsistence vs. commercial needs
- Market (or demand) for the saleable produce



### 5.3.1 Haryana

An assessment was done on the first three points listed above for the nine HRMSs that fall in the erstwhile Ambala Forest Division and are presently part of the Yamuna Nagar Forest Division. This covers about 82% of the forest area brought under JFM in the Yamuna Nagar Division and about 25% of the total forest area brought under JFM in the whole state. A more general assessment for the entire JFM area is done on the last two points.

#### Site condition

As noted above, about 94% of the area brought under JFM in the Ambala Division is under the Watershed Protection WC. This WC includes all the forests located on steep, rugged, erodable and unstable hills. The major portion of the area occurs on the higher slopes of the Shivaliks, where growing conditions are difficult.

#### Growing stock of commercial species

According to the enumeration carried out by the FD in the Watershed Protection WC, 75% of the trees growing in the WC belong to miscellaneous (i.e. commercially less valuable) species, 12% are *khair* (*Acacia catechu*) and 8% are *sain* (*Terminalia tomentosa*) trees. The rest is accounted for by *sal*, eucalyptus, *shisham* (*Dalbergia sissoo*) and *chir* (*Pinus roxburgii*). In terms of

volume, miscellaneous trees account for about 63% of the standing volume while *sain* trees account for another 23%. The trees are generally middle aged and mature, younger age classes being deficient. There is very little regeneration of the tree species. In the absence of any major planting programmes in this area, it is unlikely that the species mix would change dramatically to yield high value commercial species. The miscellaneous species growing in this tract are largely used for making charcoal and as fuel.

The Working Plan prescriptions do not indicate any intention of managing these forests for meeting commercial needs. The main objective of management is soil and water conservation. There is hence unlikely to be any major change in the species composition of the area in the future.

### Potential for harvest

In general, the extraction of timber is guided by the provisions of the Working Plan for the forest areas under which they fall. The kind of WC and the silvicultural system that is in operation decides the harvest levels and the returns.

In the case of Watershed Protection WC, it is clearly stated in the present Working Plan that there will be no felling except hygienic felling and only dead, dying and diseased trees will be removed. If these prescriptions continue during the next plan period also, then there will be no harvest of any trees from the area and the only commercial output will be *bhabbar*.<sup>13</sup> There is reason to believe that these prescriptions will continue as the area under consideration is hilly and erodible and in all WCs it is prescribed that 'no trees will be marked (for felling) near the edges of the steep and precipitous areas or on erodable sites'.

This also brings us to a related aspect: the impact of a growing canopy cover on the grasses growing in the area. A rethink of the management objectives for the area is needed. Should the areas be managed for continual grass production or should the area be nurtured for encouraging mainly tree growth? Looking to the dependence of the villagers on the fodder grass growing in the forests and the potential of *bhabbar* for meeting commercial needs as well as providing some cash income to the HRMSs in the short run, it would seem that management should be undertaken to maintain a canopy cover that allows grass production whilst ensuring tree growth at a lower density. However, whatever management system is ultimately adopted should also take into consideration the ecological needs of the area. Many foresters feel that the fragile ecology of the Shivalik hills needs a good canopy cover in order to minimise erosion in the area. Participatory microplanning can perhaps help to resolve this apparent conflict.

If felling is allowed in the JFM areas, as mentioned earlier, a large proportion of the harvest would comprise miscellaneous species.

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13. Although some bamboo may be expected, the area under bamboo is so small that there is hardly likely to be any surplus for the market.

## Subsistence vs. commercial needs

On the whole, it is expected that the forests should continue to yield subsistence requirements for the people, and at the same time produce some surplus for sale in the market. No major conflict is expected between meeting subsistence and commercial needs from the JFM forests especially if the JFM notification of 1998 is followed in this regard. The notification mentions 'All members of HRMS(s) may be permitted to collect dry and fallen wood, fencing material, limited number of bamboo and poles free of cost from their respective joint management areas for their bonafide use and not for sale'. However, some concerns have been raised about the conflicts between the commercial sale of *bhabbar* and its availability for meeting the subsistence needs of the village community. There are also some concerns regarding declining fodder production in the area, which would need to be tackled if JFM is to continue successfully.

There are clear indications that the majority of the *bhabbar* that is produced in this tract will in future be sold commercially as before the formation of HRMSs and the initiation of JFM, the *bhabbar* areas were traditionally leased to paper mills or sold in open auction. Villagers were allowed to cut a head load each for their domestic consumption. It is possible that villagers were removing quantities slightly more than this but it is unlikely that their unfulfilled needs would require the huge amounts of *bhabbar* removed by the mills. Even under conditions where more *bhabbar* is available to the villagers, there are limits to the use it can be put to since not many households traditionally follow the practice of rope making which is the main use of *bhabbar* in the villages.<sup>14</sup> So even under JFM, surplus *bhabbar* would be available for commercial sale and should be used for meeting commercial needs.

However, two issues are of importance here. One, the HRMSs must meet the bonafide needs of the members before considering sale to outsiders; and second, that it gives preference to meeting the subsistence needs and the raw material needs of artisans over increasing its cash income. Both these stipulations have been included in the JFM notification issued by the state in 1998.

## Market (or demand) for the saleable produce

The following developments in the last two decades have greatly influenced the current demand for *bhabbar*:

- *Change in the bhabbar leasing policy of the FD:* In earlier years, BILT used to take most *bhabbar* producing areas on long-term lease to meet the raw material requirements of its paper mill located at Yamuna Nagar. The FD used to charge the company only a nominal lease rent. When the company's lease expired in 1980, the FD decided to auction annual leases for *bhabbar* areas. The average rate for standing *bhabbar* immediately increased from Rs. 6.67 per quintal (the price paid by BILT in 1980 under its earlier lease) to

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14. For details regarding why it is unlikely that more HRMS members will shift to rope making as their occupation, see Sarin 1996.

Rs.18 per quintal in 1980-81.<sup>15</sup> The rapid increase in the price of *bhabbar* combined with the increased availability of a number of cheap substitutes has reduced the industrial demand for *bhabbar*.

- *Import liberalisation*: As presented in Sections 2 and 4, import liberalisation has affected the demand for indigenous raw materials by the paper industry.
- *Change in excise policy*: An important reason for the use of *bhabbar* by paper mills in the past was excise concession granted by the government. However, due to withdrawal of this concession (due to standardisation of the excise rates), *bhabbar* is no longer an attractive option for the paper mills (BILT 2000).
- *Change in technology at BILT*: BILT paper mill, which until recently was one of the largest consumers of *bhabbar*,<sup>16</sup> has undertaken massive renovation of their plant, due to which their consumption of *bhabbar* has decreased and in a time span of two to three years they aim to discontinue the use of this grass altogether (BILT 2000).

The change in technology at BILT has dramatically affected the *bhabbar* market. The price of *bhabbar* declined sharply after 1997 when BILT switched to wood-based pulp manufacturing. With the demand coming down and the HRMSs not agreeing to reduce the price of *bhabbar* (mainly because their lease prices were not reduced), many HRMSs have not been able to auction their *bhabbar*.

While the demand for *bhabbar* from the paper mills is declining, there are hardly any alternative uses or consumers for it. On the other hand, *bhabbar*, being a perennial grass, regenerates on its own in protected JFM forests, and has to be harvested each year, or it becomes a fire hazard in the summer months.

The *bhabbar* market in the state today is a buyer's market and is highly price sensitive. The price of *bhabbar* is, in turn, affected by a number of factors. The most important of these are:

- *Bhabbar lease pricing policy of the FD*: The present delinking of the lease price from the actual quantum of production of *bhabbar* has meant that the per quintal cost can vary considerably from year to year. In years of low yields, the HRMSs suffer heavy losses.
- *Harvesting cost of bhabbar*: Increasing shade effect of trees and invasion of *Lantana* have resulted in low clump density of *bhabbar* in many places. This in turn results in high extraction costs, which increase the per unit cost of harvested *bhabbar*.

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15. In 1989, BILT negotiated a new five year lease with the FD. Under this, the mill paid Rs. 28.84 for each quintal of *bhabbar* harvested during the first two years followed by an annual increase of 7.5% during the subsequent years (Sarin 1996).

16. BILT used to buy approximately 80% of the *bhabbar* from the villages.

- *Duties and taxes on bhabbar*: According to an amendment to the Income Tax Act, it has become mandatory for the FD to collect 15% of the sale price of any commercial forest produce as advance income tax from the buyers. Although the HRMSs can obtain a refund of this tax, this is a time consuming process and also involves high transaction costs. The Government of Haryana has also imposed a sales tax on all grasses, both fodder and *bhabbar*. This further increases the effective lease prices for the HRMSs. The increase in excise rates for grasses has also effectively increased the price of *bhabbar*.

### 5.3.2 West Bengal

#### Site condition

All agro-ecological zones in the state, except for the central alluvial tract, have important forest resources with distinct floristic composition. North Bengal, with a total forest area of 305,000 hectares (approximately 26% of the recorded state forest), contains good productive forests. Forests in the laterite tract of south West Bengal mostly consist of relatively small and widely scattered blocks of degraded *sal* interspersed with farm land. The most compact area is the mangrove forests in the coastal saline zone which cover 426,000 hectares (36% of the recorded forest area). However, approximately 40% of the forests in the coastal saline zone is actually made up of numerous rivers and creeks (Sarkar 1995).



The majority of the area brought under JFM lies in the laterite tract of south West Bengal. As per the JFM orders of the state, mainly degraded areas are brought under JFM.

#### Productivity

Table 5.2 presents the average annual increment in different forest types of West Bengal. It can be seen that south West Bengal forests record the highest annual increments in coppice forests and the second highest in plantations. Thus despite the forests being degraded, the productive potential of south West Bengal forests is quite good.<sup>17</sup>

Over the years, local need rather than timber production has become the major factor determining the choice of species planted. In new plantations, the proportion of indigenous and locally useful species is increasing with corresponding reduction in exotics and timber species. For example, there is a reduction in the planting of species such as eucalyptus and acacia in south West Bengal and *dhupi* (*Cryptomeria japonica*), teak and even *sal* in north Bengal (Guhathakurta and Roy 2000). The emphasis has shifted towards growing species that yield multiple locally useful products rather than just timber. This is a major change from the past as the interest of people in sustaining JFM is built on initiatives such as this (TERI 1999).

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17. The coppice forests, however, tend to lose vigour after a few rotations.



<b>Forest type/ area</b>	<b>Average annual increment (m<sup>3</sup>/ hectare/ year)</b>
High forests	
Hills	0.80
Plains	1.65
south West Bengal coppice (10 year rotation)	3.00
Plantations	
Hills (conifers)	12.50
Plains	5.00
south West Bengal (eucalyptus)	6.00

Source: Sarkar 1995.

### Potential for harvest

In general, the extraction of timber is guided by the provisions of the Working Plan for the forest areas under which it falls. The kind of WC and the silvicultural system that is in operation decides the harvest levels and the returns.

The current treatment for the majority area brought under JFM (i.e. *sal* forests) is management under the Coppice with Reserves system. The coppice rotation is kept at 10 to 15 years.<sup>18</sup> This rotation age has been worked out on the assumption that *sal* attains a marketable girth of four inches by this age. This rotation age thus attempts to balance the need for quick returns to the people and marketability of the produce.

However, many have criticised this short rotation on technical grounds. Some of the major criticisms are:

- The soil is exposed at shorter intervals leading to drier soils and their erosion. Chaturvedi (Chaturvedi 1992, in TERI 1999) has mentioned that this system would lead to total destruction of *sal* dominated ecosystems leaving behind only *Xanthium spinosum* in the end (TERI 1999).
- Malhotra and co-workers (Malhotra *et al* 1991, in Guhathakurta and Roy 2000) report that over 80% of the stumps in these coppice forests exhibit active heartwood decay. The coppice originating from infected stems are also likely to be infected. Raising *sal* forests through coppice system is therefore not advisable. It can only be achieved by slowly replacing the coppice crop with a seedling crop (Chaturvedi 1993, in TERI 1999).

18. In Bankura, one hundred *sal* trees are retained as reserves. All other miscellaneous trees like *hartaki*, *babera*, *kend*, *mohul*, *kusum*, *amla*, *peasal* etc. are also retained, in order to meet the local demands of predominantly tribal areas. Trees of age 10 years and above are harvested, keeping in view the local and market demands.

In addition, it is also feared that *sal* pole markets may get saturated soon leading to a slump in the price of poles – the main product of forests managed on short rotation. Such a fall in the prices of *sal* and eucalyptus poles has been witnessed in recent years.

The above arguments, however, have been refuted by those in favour of short rotation. They argue that an early and regular flow of benefits to the local communities is needed to maintain their interest in JFM. The coppicing power of *sal* also declines with size (Joshi 1980, in ETS 2000) and consequently longer rotation will require total or near total regeneration from seeds. There is a lot of uncertainty involved in regenerating *sal* forests from seeds (due to the recalcitrant nature of seeds, dying back of seedlings, danger of browsing etc.) and this may result in total loss of the forest. As regards the problem of fungal attack, they point out that this problem can be tackled by encouraging lateral coppice shoots over those that arise from the top of the stool (Guhathakurta 1992, in ETS 2000). Most field level FD officials stated that they have not faced any problem on account of fungal heart rot. The bulk of the *sal* crop felled had developed some heart wood and was not found to be rotten at the time of felling (ETS 2000).

Another contentious issue in the state is that of production of timber and allied products versus NTFPs. According to a study on the role of NTFPs in the village economy in Jamboni Range, West Midnapur Division, the income derived from the harvested poles after 10 years of protection is only one-third of the income from NTFPs over a period of 10 years (Malhotra *et al* 1991, in Guhathakurta and Roy 2000). Despite the possibility of achieving such benefits, the silvicultural system being practised in the state is heavily biased towards the propagation of timber trees. In south West Bengal the coppice system of management is inadequate to propagate the variety and number of wild species, many of which are useful to the people. There is a need to readjust the current silviculture system to blend NTFPs with timber, poles and fuelwood (Guhathakurta and Roy 2000).

One of the dominant concerns in the above management system is *sal* leaf harvesting versus coppicing of *sal* trees at final harvest. The present practice of *sal* leaf harvesting, according to some foresters, is harmful as it impacts on the health of the trees and production of wood, and deprives the forests of much needed leaf litter. A limited study by Debal Deb has not subscribed to this view, and there are some other grey areas of management of productive activities. For instance, *tendu* leaves may occur substantially in some areas that will require crown manipulation (Deb 1990, in Guhathakurta and Roy 2000). Impacts will definitely be felt on the productivity of the area due to such practices. As reported by Simlapal LAMPS (Bankura), collection of *sal* seeds takes more time because trees are now distantly located due to annual harvest. This is making *sal* seed collection less economically attractive than earlier.

The future harvest potential in the state will depend greatly on how these issues are resolved. Any change in silvicultural practices and *sal* rotation period will immediately change the product mix that will be available in the future. The new Working Plans that have been prepared for different divisions in the state post-1990 in fact raise a number of concerns in this direction. While approving the plans, the Chief Conservator of Forests (Central)<sup>19</sup> has rejected final harvests in coppice with reserves in south West Bengal and clear felling in mature plantations of north Bengal. Not only this, in several plans of south West Bengal, JFM has not found a place either in the general or in the special objectives of management. The plans of south West Bengal have basically three WCs:

- Coppice with reserves WC for *sal* with a rotation of 15 years.
- Development WC of multi-tier species plantations on non-rooted and poorly rooted wastes to yield both timber, fuelwood and other NTFPs, on regular harvesting regimes up to about 10 years.
- Conservation WC for promising *sal* crops for timber yield on long rotation and eco-tourism.

Silvicultural prescriptions in the conservation WC have basically stopped all harvests, with only dead and diseased trees being removed. This has meant denial of harvests to the FPCs and a stoppage of all commercial production from these areas.

### **Subsistence vs. commercial needs**

Under the present benefit sharing arrangements (as presented in Table 5.3), the most important subsistence product that is in short supply for the FPC members is fuelwood. The bulk of the superior fuelwood in the form of roundwood (about 2.5 cm and above) and splitwood coming out of intermediate and final harvests in *sal* coppice and plantations of south West Bengal are stacked in the depot and sold by auction, and 25% of the income is given to the FPC members. Women are left with inferior fuelwood only, i.e. twigs and branches, fallen, dead, diseased and dying material and few green sticks (Guhathakurta and Roy 2000). Forest floor sweeping and other accounts of people not being able to meet their fuel requirements are frequently reported. Sarkar (Sarkar 1998, in Guhathakurta and Roy 2000) has calculated that 59,080 hectares of forest and 35,081 hectares of plantation area in five districts of south West Bengal, namely Midnapur, Burdwan, Purulia, Birbhum and Bankura are affected by floor sweeping. It has been estimated that from the plantations of south West Bengal alone, 0.8 million tonnes of leaf litter is collected annually.

As is clear from the JFM Orders, while in south West Bengal and Sunderbans the FPCs do get at least 25% of the intermediate harvest (which can be largely used as fuel), in the other areas all sharing is on a net revenue basis. This focus on the commercial sale of fuelwood in the state needs to be reconsidered in the

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19. Chief Conservator of Forests (Central) is the representative of the Central Government based in each region of the country, who approves the Working Plans.

light of the continuing need of the FPC members, especially when practices like forest floor sweeping to gather fuel have a detrimental effect on forest productivity.<sup>20</sup>

**Table 5.3 FPC share in benefits from JFM**

	Share in NTFPs	Share in intermediate yields	Share in final felling
south West Bengal	All NTFPs except cashew nuts, <i>sal</i> seeds and <i>tendu</i> leaves free of royalty. Cashew: 25% of net sale proceeds. <i>Sal</i> seeds and <i>tendu</i> leaves: paid only collection charges.	25% of the products or 25% of the net sale proceeds from any intermediate harvests (multiple shoot cutting, thinning).	25% of the net sale proceeds.
Sunderbans	All NTFPs except cashew nuts, honey and beeswax. Cashew: no benefit sharing.	Same as south West Bengal.	Same as south West Bengal.
North Bengal Plains	All NTFPs except cashew nuts, <i>sal</i> seeds and <i>tendu</i> leaves free of royalty.	25% of the net sale proceeds of fuelwood and poles harvested.	No share in timber harvest. 25% of the net sale proceeds of lops and tops.
Darjeeling	All NTFPs (including inter-crops) except <i>sal</i> seeds.	Same as North Bengal Plains.	Same as North Bengal Plains.

### Market (or demand) for the saleable produce

#### *Poles*

As increasing number of *sal* forests and plantations under JFM are nearing their rotation age, the potential harvestable area in south West Bengal is increasing. The harvestable area of *sal* coppice forests and eucalyptus and *Acacia auriculiformis* plantations in south West Bengal has increased from about 4600 hectares in 1996-97 to around 25,000 hectares at present. In the absence of adequate demand, if all the potentially harvestable areas are harvested, there is likely to be a glut in the market.

20. A study carried out in parts of West Midnapur Division and Bankura (South) Division has shown that forest floor sweeping affects soil adversely. Over a period of time, it leads to a decline in soil fertility and consequently productivity. It also results in a decline in species diversity and the density of herbs, shrubs and trees (Guhathakurta and Roy 2000).

The market rates of pole crops have fallen in recent years. The major reasons for this are:

- The market has been flooded with pole crops after the introduction of JFM. Due to degradation of forests in the pre-JFM period, no harvesting of poles was carried out, especially in south West Bengal. The last harvesting was done in 1965. Because of this, the buyers have either found alternative sources of supply or have changed their business. Harvesting is now being done, resulting in increased supply of poles. This has caused a drop in the rates for *sal* poles from Rs. 166 (for a pole of girth 51-60 cm) in 1992-93 to Rs. 140 in 1997-98 and in the rates for eucalyptus poles of similar girth from Rs. 110 to Rs. 85 over the same time period (TERI 1999).
- Unlike in the past, wooden poles are no longer used on a large scale for electricity transmission (TERI 1999).

The market is further restricted due to the following reasons:

- Eastern Coalfields Limited – a large coal mining company operating in the area – does not buy eucalyptus poles for safety reasons. Although the other mining companies do use eucalyptus poles, this has restricted the market for eucalyptus poles.
- There is currently a ban on the sale of eucalyptus outside the state and this has limited the market available for it. This ban has been put to help the two main paper mills in the state, Bengal Paper Mill at Raniganj and Titagarh Paper Mill at Barrackpore. However, both these mills have reportedly stopped procuring the raw material.

#### *NTFPs*

Although NTFPs, other than fuelwood, provide income and subsistence to the FPC members, there is no comprehensive information available on their markets. Most of the NTFPs, except *sal* leaves, *tendu* leaves, *sal* seeds and *bhabbar* grass, are marketed raw, either in the local market or handed over to agents (Guhathakurta and Roy 2000).

- Nationalised NTFPs: *Sal* seeds and *tendu* leaves come under the category of nationalised NTFPs. In 1980, the government granted monopoly rights of collection and disposal of *tendu* leaves and *sal* seeds to the West Bengal Tribal Development Cooperative Corporation for subsequent allotment and operation through LAMPS on payment of a modest royalty (TERI 1999). The LAMPS, however, have failed to deliver and these products are generally traded illegally through the informal market channels. Thus, the reduction in the number of legal buyers has increased the exploitation of the primary collectors and nationalisation has choked the free flow of goods and opened the gates for contractors who operate with higher margins (TERI 1999).

- Other NTFPs: Other NTFPs mainly include *sal* leaves, *bhabbar* grass, edible mushrooms and medicinal plants. Such produce flows from the collector through one or more intermediaries (that may include village merchants, traders and processors) to the consumers. In some cases, however, no intermediaries may be involved. For example, mushrooms are sold without any processing in the local market (TERI 1999).

There is no strategy or approach to tackle the problem of private traders exploiting the primary collectors in the FPCs, who do not have much bargaining power. FPC members may have little idea about alternative markets (Guhathakurta and Roy 2000). Collectors currently get only a fraction of the price paid by the final consumer. For example, several medicinal plants such as *Kalmegh* and *Anantmul* are collected by traders and sent outside the region for processing. Collectors get a meagre sum while the bulk of the profit is cornered by the intermediaries. The income of the FPC and the collectors can be enhanced by adding value to the NTFPs at the FPC level itself (ETS 2000).

Medicinal NTFPs have an informal market since the supply is irregular and collection takes place as per the demand made by local traders and middlemen. The problems associated with their marketing are elaborated in Section 6.

Overall, inadequate marketing facilities and inefficient marketing systems are affecting the returns to the FPC members in south West Bengal (Guhathakurta and Roy 2000). The monopoly purchase rights of certain NTFPs granted to the LAMPS are a major policy related constraint in the marketing of NTFPs (ETS 2000).

## 5.4 Potential impacts of JFM commercial production

During the past decade, the JFM programme has played a key role in regenerating degraded forest areas and increasing productivity. While it is possible to use part of the produce for commercial sale and to enhance the income of the local community, there are concerns about linking commercial interests and the JFM programme. The main ones are as follows:

- Since the main reason behind initiating JFM is protection and regeneration of degraded forests, the concept of commercial production is not very relevant.
- Commercial interests imply long gestation crops (perhaps even monocultures) and thus may involve sacrifice of the subsistence needs of the local people.
- Since biotic pressure is one of the main reasons why forests became degraded in the first place, the major objective of JFM should be meeting the subsistence needs of the community in a sustainable manner.

However the increase in incomes associated with commercial production is an important incentive for continuing JFM. This is particularly so in areas where people have surplus produce after meeting their consumption needs. As is the case in Haryana, the large quantities of *bhabbar* produced cannot be consumed locally. If commercial sale of the surplus *bhabbar* were not allowed, there would be no incentive to increase production. In fact, several HRMSs, where lease price policy of the FD has made commercial sale of *bhabbar* difficult, show relatively less interest in managing their forest patches.

Whether the forests should yield commercial produce or not, once the village is able to meet its subsistence and artisan needs, should be for the FPC to decide.

Since a forest can yield much more than just timber, it is very much possible that bringing a commercial orientation does not necessarily mean a sacrifice of subsistence produce. NTFPs harvested for commercial sale can easily be integrated with management of the forests for meeting subsistence needs.

While at an aggregate level it seems that linking commercial interests with the JFM programme has had beneficial impacts, it is important to ensure that the impacts are equitable and not biased against the poor, marginalised and other disadvantaged sections of the society. If the rich and the poor are to be equal beneficiaries as well as equal bearers of the cost of protection, it is necessary to ensure that the two most important subsistence needs of the people, fuelwood and fodder, be met on a priority basis. Meeting these needs must have primacy over commercial production. This is important also from the point of view of sustainability. If these needs are met, returns from commercial production can further improve prospects for sustainability of the JFM programme.

## 5.5 Generating commercial output from JFM areas: an analysis

It is of critical importance that meeting the subsistence and livelihood needs of the village communities should remain the first charge on forest areas. It is only after the subsistence needs have been met that commercial gains should be pursued. It is quite possible, however, that generating income through the commercial sale of surplus forest produce could set in place processes and interests that are detrimental to the JFM programme and FPCs themselves.<sup>21</sup>

The analysis presented in Table 5.4 summarises the strengths, weaknesses, opportunities and threats ('SWOT') associated with commercial output from the JFM areas. Clearly, income generation (not only for the FPC but also for the FD) is the single most persuasive reason for encouraging commercial sale of surplus forest produce. However, the flip side of this is that where FPCs are unable to realise the benefits promised to them (which could be due to a range

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21. This is an argument forwarded by those against the inclusion of commercial interests in the JFM programme. They fear that the entire programme may be hijacked by vested interests.

of institutional, technical, ecological, managerial or marketing factors), they might turn to plundering of the very forest that they previously protected. On the other hand, income generation might become the sole motive of the powerful and wealthy within the FPC, resulting in commercial needs overriding the subsistence needs of the poor. Equity issues might get sidelined in the quest for income.

Awareness generation, empowerment, training and capacity building at the FPC level can help overcome some of these problems. The existence of a network of NGOs within the country, the availability of funds in most externally funded forestry programmes for training and capacity building, the provision for preparation of a microplan that incorporates the needs of the village community etc., are all opportunities that can be utilised to ensure that all sections of village society benefit equally from the JFM programme.

<b>Strengths</b>	<b>Weaknesses</b>
<ul style="list-style-type: none"> <li>• It will increase income of the communities. Income incentive is likely to provide motivation to FPC members and this can result in better protection and utilisation of forests.</li> <li>• It will make the local communities less dependent on government funds for forest and village development.</li> <li>• It will increase revenue for the government.</li> <li>• It will provide additional industrial raw material.</li> </ul>	<ul style="list-style-type: none"> <li>• Income generation might become the prime concern of the FPCs, making the fulfilment of subsistence needs a secondary issue. This could have a detrimental impact on the poor.</li> <li>• The sale of forest produce to meet commercial needs might bring in vested interests, further marginalising the poor and disadvantaged sections.</li> <li>• The focus on commercially valuable species may lead to neglect of other species adversely affecting the ecology of the area.</li> </ul>
<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>• Supportive JFM resolutions that enable harvest of forest produce for meeting both subsistence and commercial needs.</li> <li>• Availability of funds in the externally assisted JFM projects to take up market feasibility studies and to implement strategies to overcome the present marketing problems.</li> <li>• The existence of NGOs in a number of states that can be involved for awareness raising as well as protecting the rights and needs of the poor and other disadvantaged sections.</li> <li>• Interest in industries to source some of their raw material from JFM areas.</li> </ul>	<ul style="list-style-type: none"> <li>• Change in FD policy or failure to keep the promises made to the communities may lead to regressive effects not only on the forest areas but also on the future relationship between the people and the FD.</li> <li>• The success of the endeavour is largely dependent on the interest and capability of the FPC to handle forest management issues. The present low level of management capacity at the FPC level is a serious threat to the system.</li> <li>• Poor skills and infrastructure in government to handle marketing issues.</li> <li>• Competition from private sources as well as imports.</li> </ul>



Although commercial production from JFM forests is seriously threatened by numerous factors, as elaborated above, the commercial viability of JFM projects is now being recognised by banks also. A study undertaken by NABARD in collaboration with FAO in Andhra Pradesh concluded that JFM in areas having predominantly teak, *sal* and bamboo is a commercially viable venture and the banks would be ready to provide credit for it. The study estimated that with an investment of Rs. 10,000 per hectare, a return of Rs. 80,000 is possible by sale of poles and other NTFPs in eight to ten years. However, for bank credit for JFM to materialise, certain reforms, especially in the legal framework to provide security to the banks for lending to FPCs, are needed (Haque 2000b).

NABARD sanctioned its first ever loan for JFM to Andhra Pradesh in December 1999 after obtaining a government guarantee. Subsequently two more loans were sanctioned in February and March 2000. All these loans were provided from the Rural Infrastructure Development Fund. With the help of these loans 141,207 hectares of degraded forest lands are proposed to be treated through 918 FPCs (Haque 2000b).

Recently, corporate sector involvement has also been sought to support JFM. While some companies are assisting in the JFM programme (e.g. Tata Electric Company, IPCL and Uttam Steel Limited in Maharashtra and TVS-Suzuki in Tamil Nadu), their involvement has so far been marginal and mainly in the nature of charity or public relations exercise (e.g. Tata Electric company has built some water closets in FPCs while Uttam Steel Limited has provided a steel pipe to Khalapur FPC in Raigarh district, Maharashtra). The only state where the involvement of corporate sector has been sought on a meaningful scale in order to sustain the JFM programme is Andhra Pradesh. A government order (G.O. Ms No. 112) was issued on 22 September 2000, which permitted companies to enter into tripartite agreement with FPCs and the State Government.

These initiatives mark the beginning of the commercialisation of JFM programme. The experience generated from these initiatives will help in understanding the issues connected with commercialisation of JFM.

## 5.6 Summary of potential production from JFM

In Haryana, the output of grasses is the major benefit that accrues to the HRMSs presently. It is unlikely that poles, timber and other major forest produce will become available to the HRMSs under the current management regime or that this area will yield any other substantial commercial produce. It is hence necessary to note that commercial production of *bhabbar* from the HRMSs needs to be nurtured so as to assure continued benefits to the people. This, of course, needs to be done keeping in mind the ecologically fragile nature of the Shivaliks region. The present threats to the system are from the lease price policy of the government, closing canopy cover, weed infestation, shrinking market and declining prices. Corrective steps are needed on all fronts. There is also a clear need to explore new markets (including new uses) for the *bhabbar* produced.

In south West Bengal, final harvests are a major incentive to the people for undertaking JFM. Any change mid-way in the policy to restrict harvest, as has been done in some areas in the state, may well be counter-productive. However, unless steps are taken to ensure market for the produce harvested, interest in JFM may wane.

On the basis of insights gained from the two states, it is clear that the potential commercial production from JFM will depend on many factors. These include the kinds of land brought under JFM, the productivity and growing stock on these sites, the kind of plantation activities taken up, the kind of WC and the silvicultural system that is in operation in the JFM area, the sharing arrangements in place, the availability of harvested produce for sale and the market for the saleable produce.

Because of the multiplicity of factors that influence commercial production as well as the great variation found across the country, it is not possible to generalise for India as a whole regarding the potential that JFM areas have for commercial production. However, the two case studies do give some insights. The scope for commercial production from fragile ecosystems that are brought under JFM (e.g. Shivaliks region of Haryana) is limited as the emphasis in such areas is on restoration of ecological stability. This calls for maintenance of a good canopy cover that severely restricts the scope of final harvests and hence the availability of any kind of wood product, such as timber, poles, pulpwood, or fuelwood, which can be commercially traded. The commercial potential in these areas is for selected NTFPs only.

In forest areas that are currently degraded and not producing any major commercial produce, but which have good regenerative potential and a species composition that yields a variety of forest produce including NTFPs (as seen in south West Bengal), the potential for commercial production exists. However, the potential will not be realised unless:

- the product mix harvested from the forests is changed in accordance with the new commercial needs; and/ or
- forest-based enterprises are set up to utilise the surplus production.

Finally, if the potential for commercial production from JFM forests is to be meaningfully realised and sustained in the long run, it is essential that:

- the local community, especially the poor and most forest-dependent groups, are fully involved and supportive of this venture,
- silvicultural prescriptions followed for management of the forests are sustainable,
- the supply of forest produce is in line with demand,
- marketing infrastructure and institutions are improved, and
- policy bottlenecks are removed.

# Promoting sustainable management: a case study of the ayurvedic industry

## 6.1 Introduction

This section looks at the role that market-based instruments can play to enable the ayurvedic industry to contribute to the sustainable management of medicinal plants, many of which grow in forest areas. Following a synthesis of existing information on the ayurvedic industry, this section considers value addition along the supply chain, current and potential market demand, and the potential application of market-based instruments. These instruments would be applied with a view to both ensuring a sustainable supply of high quality medicinal plants of known origin to the ayurvedic industry, and finding ways to secure economic benefits for cultivators/ primary collectors.

### Box 6.1 Ayurvedic system of medicine

The ancient system of ayurvedic medicine is thought to have originated in Vedic times around 5000 years ago. In ayurvedic terms, good health is believed to result from balance between three basic forces or elements: *vata*, *pitta* and *kapha*. These relate to all physical and mental processes, and maintaining harmony between these different elements is key to the concept of ayurveda.

The range of systems of knowledge known as Traditional Health Systems – of which ayurveda is predominant – have, except during the colonial period, always been recognised as the formal health system in India. Knowledge of these systems has been passed down through generations, and even today much of the knowledge is kept within the families of ayurvedic practitioners. Currently, interest in ayurveda continues to grow, both within India and internationally. More than 8000 plants have been found to be of medicinal value, and combinations of these are used to produce ayurvedic formulations.

### 6.1.1 Raw material appraisal

Ayurveda uses medicinal plants in various forms. Harvesting can be destructive for many plants: for about 30% of plants, roots are used; in 16% of plants, the whole plant is used; and in 13% of cases, bark is used. In other cases, medicines use the fruits, leaves, flowers, rhizome, seeds etc. It is commonly thought that medicinal plants are mainly herbs, but in fact about one-third are trees – this has implications for conservation and management of supplies to the industry.

The effect of agroclimatic conditions on the chemical composition and therapeutic properties of a medicinal plant species are well recognised and documented in ayurveda (Sarkar 1996). For example there are seven varieties of



'Haritaki' (the fruit of *Terminalia chebula*) which originate in different parts of India and which are known to have different therapeutic properties. Seasonal variation and age have a bearing on the composition of drugs.

### 6.1.2 Resource base

Ayurveda classifies ecological zones/ habitats according to soil conditions, and identifies the source of a particular medicinal plant from a specific ecological zone. It thus distinguishes and attaches significance to the natural habitat of particular species.

The various agroclimatic zones of India harbour a variety of species of medicinal plants. In particular, the forests of the Himalayas supply a large proportion of medicinal plants, and the Western Ghats form another major source of supply. Around 80% of the medicinal plants active in trade are procured from wild areas, mostly notified as forest land (Gupta 1993; Ahmed 1993; FRLHT 1996). Whilst the majority of plants used in ayurvedic formulations are procured from the wild, around 10% are cultivated on private lands. In addition, some tree species are found both in the wild and on agricultural lands (e.g. *Butea monosperma*, *Mangifera indica*, *Sapindus emarginatus*, *Tamarindus indica*). Also, some species are now grown commercially, specifically to supply the large-scale ayurveda industry but this cultivation remains a very small proportion of the overall supply.



## 6.2 Overview of the ayurvedic industry

### 6.2.1 Organisation of the ayurvedic industry

Ayurveda is predominant amongst India's health care systems and has a 70% share of the formal medicine market.

Ayurvedic manufacturing units can be broadly classified into two groups:

- the 'organised' sector, comprising well-established manufacturers who operate in both domestic and/ or international markets. These could be large or small units. Often a small manufacturer can be considerably strong in a niche market.
- the 'unorganised' sector, comprising mainly practising ayurvedic doctors (*vaidyas*) and micro-units manufacturing only a few products and operating at local levels.

There are around six thousand licensed and perhaps a similar number of unlicensed manufacturing units. The large number of manufacturing units can be attributed to comparatively low infrastructure costs, access to raw material, simple manufacturing processes and lack of standardisation of quality and efficacy of medicines.

It is estimated that the total annual turnover of the industry is around Rs. 45 billion, although the figures are uncertain due to the large number of micro-units.

## 6.2.2 Nature of the ayurvedic industry

Ayurvedic drug manufacturing companies, whether in the organised or unorganised sector, are mostly family owned businesses. The origin of most of these companies can be traced back to a *vaidya* who used to prepare some formulations for dispensing. The gradual acceptance of the medicines over time led to the growth of such units. Many such companies are now being run by third generation owner-managers. The ownership pattern has helped in transfer of knowledge from one generation to other, thereby enriching the knowledge base of families. But it has also brought in conservatism and a secretive attitude in the sector, which has affected its amalgamation with the general stream of development. This is particularly so in the matter of standardisation of raw material as well as medicines.

In general, the medicinal plants trade in India may be described as extremely complex, secretive, traditional, badly organised, highly under-estimated and unregulated. There is no macro level information available for assessing the nature and full extent of the trade; there are only 'guesstimates' based on local inventories and micro studies. Identification of species and volumes traded is further complicated by the fact that there is no reliable correlation between trade names and botanical names, and names used for particular species may change along the supply chain. Conversely, the same trade name is even used for several species, especially if they are used for similar purposes.

## 6.2.3 Value addition along the supply chain

The study included a focus on value addition and information flow mechanisms along the supply chain from the primary collector/ cultivator to the large-scale processing industry. For the purposes of this study, twelve species were selected for study of aspects relating to conservation, collection, cultivation and trade in medicinal plants. In an attempt to ensure the sample of twelve species was representative, selection was made according to a range of factors including habit, plant part used for medicinal purposes, abundance in the wild, natural population of the species, regeneration status in the wild, reported cultivation price and volume traded. The twelve species selected include three shrubs, four trees and five herbs.<sup>1</sup> However, this is an initial study that should not be taken as being truly representative of the entire medicinal plants trade in India.

The survey identified a number of factors that affect the final price. Volumes traded are directly proportional to the prices of the raw material which in turn are proportional to the abundance/ availability of the species. There is also a connection between the part used and prices, so that species that are destructively harvested seem to be more expensive. High altitude species such as *Nardostachys grandiflora*, *Picrorhiza kurroa*, *Swertia chirata* also are high value species. Price also increases with the distance of the source of raw material from the market.<sup>2</sup>

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1. The twelve species selected for study are: *Aloe vera*, *Chlorophytum borivillianum*, *Commiphora wightii*, *Embelia ribes*, *Embllica officinalis*, *Nardostachys grandiflora*, *Picrorhiza kurroa*, *Rauwolfia serpentina*, *Saraca indica*, *Swertia chirata*, *Terminalia chebula* and *Withania somnifera*.

2. Full details of prices for the twelve selected species along their respective supply chains are given in the substudy on the ayurvedic industry (see preface for reference).

## 6.2.4 Supply channels

Market centres for medicinal plants may be divided into three categories – major, medium and minor – based on the number of traders and annual turnover. According to one estimate, there are six major, 21 medium and 35 minor markets of medicinal plants spread across India (Rawal 2000). Out of these, major export takes place from Mumbai (the largest export market), Delhi, Chennai and Tuticorin.

The general supply channels leading to these market centres can be different for each species. However, the following distinct set of players can be identified:

*Collectors:* usually comprise people living in or near forests and include tribals and the rural poor, who are most dependent on the forests for their basic needs. Seasonal collection of medicinal plants provides supplemental income to the families involved and is not generally a full-time economic activity. The rates paid to the collectors for the herbs are extremely low, and bear no relation to the final price paid by the consumer.

*Local agents/ traders:* they buy the raw material from a number of collectors in the village, often operating in a group of villages simultaneously. Always men, local agents/ traders mostly belong to the upper castes.

*Stockist or agents at state level:* state level agents, known as stockists, operate from major/ medium markets or *mandis*. The stockist or the agent at the state level is often in touch with his counterpart in the main markets like Delhi, and may specialise in supply of a certain set of medicinal plants.

*Commission agents:* are located in the major markets (e.g. Mumbai, Delhi, Chennai, Calcutta) and buy the raw material from the stockists operating in the medium/ state level markets. They are extremely well organised and often have their own storage facilities.

*Suppliers:* are mainly to be found in the major centres and specialise in supplying to one or two major manufacturers like Dabur or Zandu. They procure raw material from the commission agents or the stockists and then supply to a single large manufacturer.

*Wholesale traders:* are located at the final major markets in the big cities like the four metros of Mumbai, Delhi, Calcutta and Chennai. They make the final purchases before they are supplied to the manufacturers, retailers in the cities, and other petty traders. They are in fact, often the initiators of business transactions, in that their placing the orders with the Commission agents results in a backward chain of reactions reaching down to the collector level.

This long chain of supply of medicinal plants leaves very little for the collectors/ cultivators. The prices along the supply chain for the twelve selected species were tracked to ascertain the approximate share of the final cost of the product

obtained by each of the players in the supply chain.<sup>3</sup> It was observed for the species selected for the study that the collectors get as little as 3% of the final price in case of species like *Embelia ribes* and *Nardostachys grandiflora* while in the case of *Commiphora wightii* the collectors receive a maximum share of 58% of the final price. The collectors' low share of the final price could well be a deterrent in generating interest of cultivators in sustainable management of medicinal plants, when they receive such low returns.

Information flow between the different players in the supply chain is linear with no direct contacts between the collectors/ growers and final consumers. Apart from a few species like *Aloe vera* or *Tinospora cordifolia*, which are generally used fresh, all other species reach the final consumer through one or more middlemen.

One means of ensuring better returns to the primary collectors/ growers might be to develop semi-processing of raw materials at the village level: at first sight, there appears to be tremendous scope for negotiating a higher price if the raw material is cleaned and graded. However, the production processes involved in making formulations include drying, powdering, making aqueous extracts, boiling, distilling and cooking: most of these must be done in sequence and are logistically best done in a central place. Furthermore, it would be very difficult to ascertain the quality of the raw drug being used if semi-processed material is purchased in the form of powders, pulp, extracts, etc. Also there is little difference in terms of cost effectiveness, hence little incentive for manufacturers to consider increase in local semi-processing.

However, it does appear that there is more scope for local semi-processing of raw material to supply the herbal cosmetic industry, rather than the pharmaceutical industry. Small production units with low capital investment might enable local groups to add some value to the raw material – for example through washing, cleaning, drying and grading – before it leaves the village level.

## 6.3 Trends in demand and supply

### 6.3.1 Domestic market demand

About 70% of India's population is estimated to use traditional medicine (ITCOT 1999), and many of the rural poor, particularly tribal and other forest-dependent populations have no access to other systems of medicine.

The ayurvedic industry has witnessed a steady increase in market share over the last two decades. A survey of agents and manufacturers indicated an annual compound growth rate in domestic sales of 20%. Considering the estimation of Rs. 25 billion domestic market size in 1998, the market size and demand for ayurvedic medicine in the year 2004 is predicted to be about Rs. 75 billion.

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3. Full details are given in the substudy report (listed at the front of this report).

### 6.3.2 International market demand

The World Health Organisation (WHO) estimates that over 80% of the world's population relies on traditional plant-based medicine for their primary health care needs (Bannerman *et al* 1983). The international market for medicinal plant-based products is estimated at US\$ 60 billion and is growing at the rate of 7% per annum.

Germany, UK, France, Switzerland, Japan and USA are major importers of Indian medicinal plant products. The major exports from India are in crude forms: herbal medicine can be sold in processed form only if the formulation is registered in the country of import. This is a lengthy and costly process, hence most of the ayurvedic drugs are either sold as para medicine or food supplement. During 1986-87, India exported crude drugs valued at about Rs. 660 million. During the last decade, exports reached a value of Rs. 4.46 billion. A recent report by the Planning Commission estimates massive potential increases in this export volume, to Rs. 30 billion by 2005 and to Rs. 100 billion by 2010 (Planning Commission 2000).

The global demand scenario provides a very considerable potential market for ayurvedic products. However, despite estimates of rapidly increasing demand, India's share of the world herbal market is quite insignificant – the value of herbal exports from China and Thailand, for example, are much higher (e.g. China's exports are around Rs. 220 billion compared to Rs. 4.46 billion for India).

### 6.3.3 Supply crisis

Given rapidly increasing demand, there is tremendous pressure on the supply base; this has reached crisis point for some species. It is reported that certain species of medicinal plants have already become extinct through over-harvesting, and other species are endangered. Drug manufacturers do make use of alternative species (relying on advice from traditional ayurvedic texts) when the 'first choice' is no longer available. However, there are reports that even some of the 'second best' alternatives are now facing extinction. Further, there are concerns about maintaining the quality of supplies.

### 6.3.4 Options for addressing the demand-supply gap

There are a number of potential (and some actual) responses to this demand-supply gap. These include the following:

- *Substitution of raw material*: Classical ayurvedic texts authorise the use of alternate species when the original plant prescribed in the text is not available. However, even some of the substitute species are now in short supply.
- *Import of medicinal plants*: Indian markets are heavily dependent upon medicinal plants imported, both legally and illegally, from neighbouring countries, particularly Nepal and Bhutan.



- *Cultivation of plants by the corporate ayurvedic industry:* Given a soaring export market and increased domestic demand, coupled with uncertainty and scarcity of raw materials, adulterated materials and government restrictions on exports of some species collected from the wild, some of the large-scale ayurvedic manufacturers have opted for cultivation of medicinal plants (see Box 6.2).

### Box 6.2 Corporate industry's response to the supply crisis – cultivation of medicinal plants

More than 25 private companies are engaged in nursery development, generation of planting material and seeds, development of techniques for cultivation of medicinal plants, and contracting out cultivation to farmers (Katiyar and Narayana 1998). (see Annex 11).

For example, Dabur's 'Plant for Life' project aims to develop a sustainable source of medicinal herbs through collaboration with farmers. Started in late 1997, the project has a greenhouse, shade house and terraces for out-planting; currently seedlings of twenty medicinal plants are being cultivated, of which eight are endangered species. It is envisaged that seedlings will be provided to farmers for cultivation, and the resulting plants and/ or their products may be supplied back to Dabur or any other interested company under a buy back guarantee scheme.

Arya Vaidya Sala, another leading manufacturer of ayurvedic products, has undertaken research into the propagation of ten species, resulting in recommendations for *in situ* conservation, and the possibility of re-introduction in forests in collaboration with the FD. Planting materials of economically viable plants were distributed free to farmers, with supporting technical advice. Farmers were free to sell the harvested raw material in the open market, but with the assurance that Arya Vaidya Sala would purchase it at market rates. However, initial constraints faced by farmers included long gestation periods for some species, distress sales in the case of perishable species, and vulnerability to market fluctuations due to lack of good market information.

Initiatives such as these represent potential progress in ensuring sustainable supply of certain species, but, so far, the raw material from farms directly owned or sponsored by industry represents a very low proportion of overall industrial demand.

The industry has expressed various constraints to cultivation, such as: land ceiling restrictions, lack of agrotechnology, inadequate support for wastelands development, and infrastructural issues concerning research and development.

- *Cultivation of plants by farmers:* Selected species suitable for cultivation tend to be perceived as short rotation, herbaceous cash crops that are more profitable than other crops. The cash-crop/ profit mindset presumes a high input agricultural affair involving irrigation, fertilisers, pesticides, marketing etc. This limits the 'cultivation' of medicinal herbs generally to the well-off farmers, who can afford to take risks. Small and marginal farmers are much less likely to benefit. Furthermore, it is highly unlikely that cultivation of medicinal plants will contain or reduce collection pressure from the wild. Not only do many species only occur in forest environments, but their collection is of great importance to the livelihoods of forest-dependent people. So whilst cultivation might meet bulk industrial requirements of particular species and benefit large farmers, it is unlikely to benefit poorer sections of rural communities.

- *Enhancing production from natural habitats:* Not all species of medicinal plants can be cultivated (for ecological or economic reasons).<sup>4</sup> The production of medicinal plants in their natural habitats can be enhanced through protection and better management. Instead of cultivating one or two medicinal plants on farms, a number of medicinal plant species can be grown mixed together in their natural or near natural environment. There are several initiatives to encourage growing of medicinal plants by community groups – such as the Medicinal Plants Production Areas, promoted by the Himachal Pradesh FD. However these initiatives are still in the early stages.
- *Forest department and NGO initiatives:* These include *in situ* and *ex situ* conservation, germplasm collections, plantation projects, research on selected species, attempts to integrate medicinal plant cultivation into JFM arrangements, etc. Conservation and preservation of genetic diversity of different medicinal plant species is needed even to sustain cultivation in the long run.

In addition to these attempts to address the demand-supply crisis, there is one long-established response which represents an unofficial, illegal response by sections of the industry. The widespread occurrence of *adulterants* is one of the most striking aspects of the medicinal plants trade, underlining the absence of an effective mechanism of regulation, quality control or standardisation. An ‘adulterant’ is an entirely different species to the original prescribed, which does not necessarily possess similar properties to the original, but which is passed off as the original. For six out of the twelve species selected for study, some form of adulteration is known to occur; the processes employed in producing adulterants are subject to much secrecy. This poses major challenges to any market-based intervention in the trade, as well as to any attempts to integrate traditional medicine into the mainstream health services.

## 6.4 Institutions responsible for the medicinal plants trade

There are numerous national and state government ministries and departments with some responsibility for medicinal plants;<sup>5</sup> however it is not clear whether any of these actors take overall responsibility. Even within the MoEF, there are seven different divisions charged with some responsibility for different aspects of medicinal plants. Nevertheless, aside from a recent Planning Commission initiative (Planning Commission 2000), there appears to be little recognition of the importance and potential of medicinal plants both in commerce and in terms of the livelihoods of forest-dependent people.

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4. The cultivation techniques for many medicinal plants are poorly developed at present and as such it is difficult to successfully grow them outside their natural habitats. The medicinal properties of several plants are also affected if they are cultivated. Some are needed in such minute quantities that it is not economical to grow them on a large scale.

5. Such as Ministry of Environment and Forests, Ministry of Health and Family Welfare, Ministry of Agriculture, Department of Science and Technology and Ministry of Tribal Affairs.

The operations of NGOs, communities and individuals are mostly at the micro level and it has been difficult for them to contact the industry and develop viable working relations. A nodal agency could work as a platform for the benefit of both the collectors/ cultivators and manufacturers. Two major factors which might have hindered the growth of the relationship between the industry and collectors/ cultivators are the credit facility availed by the industry<sup>6</sup> and the quality perceptions by the industry. The issue of quality also restricts the avenues for value addition by the collectors/ cultivators. A nodal agency could address the potential for value addition at the local level and ensure quality.

Up until now, the lack of coordination between various stakeholders and regulators has hindered the development of the medicinal plant sector. At the national level, there has been hardly any coordination between cultivators, collectors, industry and government agencies. However, in November 2000 a Medicinal Plants Board was established by the Department of Indian Systems of Medicine and Homeopathy under the Ministry of Health and Family Welfare, comprising government, trade, marketing, the pharmaceutical industry and medico-ethnobotany representatives. Cultivators, researchers, NGOs and state governments are also likely to be involved. It is possible that this Board will fulfil some of the functions of the nodal agency referred to above.

## 6.5 Potential application of criteria and indicators

### 6.5.1 Emerging needs for sustainable management of medicinal plants

As described above, there is a crisis in the supply of medicinal plants, such that some species are already extinct through over-harvesting, whilst others are endangered. Short-term solutions appear to be limited: cultivation is appropriate for only certain species and will not, in any case, prevent collection from the wild by those who depend on such activities for their livelihoods. Apart from shortage of supply, the industry's primary concern is the quality of raw material: this presents a major challenge given the prevailing secrecy in the ayurvedic industry and the adulteration of raw material.

The potential for organisation at the community/ collector level needs to be explored, as also the possibility of ensuring better returns to primary collectors through value addition at the local level. Organisation and control of production may also be encouraged if consumers or retail buyers express preference for supplies that derive from socially and environmentally sustainable production. Whilst it may be some time before the extent of such preferences encourages large-scale changes in production, this paves the way for the introduction of market-based instruments as a mechanism for meeting consumer demand whilst ensuring sustainable production.

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6. The industry prefers to deal through middlemen as they usually supply raw material on credit basis.

In order to move towards a system of sustainable management of medicinal plants, there is a need address a number of issues, including the following:

- *better information* on current status and potential production, to provide a baseline from which strategies for sustainable production may be developed
- *more transparent supply chain information* in order to improve the bargaining power of those near the start of the chain, and to help ensure good quality materials for the ultimate consumers
- *organisation of collectors* at the local level; promising models are already being developed, and these might help to put in place mutually enforced codes of collection and sharing of marketing benefits.<sup>7</sup>

### 6.5.2 Relevance of criteria and indicators (C & I)

The development of C & I for the sustainable management of the forests or other landscapes in which medicinal plants are found can help to define good practice, and can be applied to measure progress towards sustainable management. Application of C & I for sustainable management and supply of medicinal herbs to industry may help to address some of the needs identified above; but it has to be driven – by voluntary approaches of the collectors (generally the weakest party); by regulations (dependent on enforcement capacity) or by buyers (who will probably want proof of sustainable management through third party certification).

The application of C & I for certification of raw material and products would primarily benefit the collector and the end-user. The market value – or more probably, market access – for certified products would be greater if the industry could ensure sustained supply. So whilst overall volumes of plants harvested under sustainable management would likely be lower, the price and market access would be enhanced.

At present it is unlikely that certification of medicinal herbs will be feasible in India, except where collection/ cultivation areas are subject to control by a recognised ‘manager’.<sup>8</sup> If, in due course, it is applied, it may add to the cost of raw materials and may be reflected ultimately in the price of the products. However, this will ensure ecological, social and economic sustainability.

Initially, there could be scope for a voluntary code of practice, complemented by education of both consumers and producers. C & I can help to show what is good practice, and can be applied as a means of measuring progress towards that good practice. However, the current extent of the illegal trade seems to be so great that application of C & I would not make significant difference to the overall trade, unless it is market-driven. These constraints aside, the following sections identify draft C & I for application to the management of medicinal plants.

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7. For example under the Van Dhan programme, tribal collectors of NTFPs (mainly tamarind) in Bastar have been organised into committees and through collective action and government support they have been able to increase their income several fold, mainly through better marketing strategies.

8. The first few cases where certification has been sought by a private producer have been reported in 2001. Two of these pertain to bamboo plantations and the third to *Acacia nilotica* plantations. Teddy Exports, a company based in Madurai, which exports wooden products (such as body massagers) to Body Shop International Plc has sought independent Forest Stewardship Council certification from the Soil Association, United Kingdom. The company’s wooden products are produced using *Acacia nilotica* wood obtained from tank foreshore plantations.

### **6.5.3 Identification of draft C & I for medicinal plants**

A set of eight criteria and 43 indicators for sustainable forest management in India has been developed, as part of the 'Bhopal-India Process'. Out of these, all eight criteria and 32 indicators can be applied to the sustainable management, development and use of medicinal plant resources (see Table 6.1).

### **6.5.4 Potential and constraints of application of C & Is**

The set of C&I are potentially a reliable tool for measuring the success of conservation and development measures as it will simultaneously indicate the social, economic and ecological contribution of medicinal plants. Despite the great contribution medicinal plants are making in local health care and the economic benefit flowing through trade and exports, not much of this contribution is documented. With the use of tools like C&I, the value of medicinal plants would be highlighted, as would their contribution to India's gross national product. This would provide an opportunity to increase sustainable production of medicinal plants.

Measurement of indicators may have some limitations, as not all of them can be measured in one go. According to their measurability, they can be grouped into three categories (i) those which can be measured from existing secondary sources of information (ii) those for which information can be gathered with little effort and (iii) those for which information may require long-term research. In the early stages, the indicators of first group and some of second group can be measured. As resources develop and the potential of medicinal plants grows, the third category of indicators can also be measured through investment in research and development.

### **6.5.5 Monitor and certification**

Third party certification is essential for market reward. For example, institutions like the Indian Institute of Forest Management (IIFM), Bhopal, can act as an impartial agency for such work; training in certification issues is being imparted under the WWF/ WB Alliance initiative with which the Institute is associated. A number of NGOs and other autonomous institutions in different parts of the country can be identified to undertake certification. The development of group certification schemes will help to lower the cost of certification.

## **6.6 Conclusion**

As described above, the production and processing of ayurvedic plants is highly complex and there are many aspects where improvements might be made. A number of recommendations are presented in Section 8, relating to the sustainability of forests and other landscapes from which medicinal herbs are extracted, the livelihoods of those involved in collection and cultivation, and the sustainability of the ayurvedic industry. However, these recommendations constitute some initial thoughts as a result of this study. Further research is clearly necessary in a number of areas.

**Table 6.1 Draft criteria and indicators for the sustainable management and supply of medicinal plants**

Criteria	Indicators
1. Increase in the extent of forest and tree cover	1.1 Area of dense and open forest 1.2 Area under JFM
2. Maintenance, conservation and enhancement of biodiversity	2.1 Area of protected ecosystems 2.2 Area of fragmented ecosystems 2.3 Number of rare, endangered, threatened and endemic species 2.4 Level of species richness and diversity in selected areas 2.5 Availability of medicinal and aromatic plants in various forest types 2.6 Status of non-destructive harvest 2.7 Number of keystone and flagship species in various forest types
3. Maintenance and enhancement of ecosystem function and vitality	3.1 Status of natural regeneration 3.2 Extent of secondary forests with medicinal plants 3.3 Incidence of pests and diseases, weed infestation, grazing and fire
4. Conservation and maintenance of soil and water resources	4.1 Extent of ground cover 4.2 Area under watershed treatment 4.3 Soil erosion status
5. Maintenance and enhancement of forest resource productivity	5.1 Growing stock of keystone and flagship species 5.2 Volume of production of identified/ important medicinal plants
6. Optimisation of forest resources utilisation	6.1 Aggregate and per capita consumption of medicinal plants 6.2 Import and export 6.3 Recorded removals 6.4 Direct employment in conservation, development and extraction 6.5 Direct employment in ayurvedic industries 6.6 Level of processing and value addition
7. Maintenance and enhancement of social, cultural and spiritual benefits	7.1 Degree of people's participation: number of committees and area protected by them 7.2 Use of indigenous knowledge 7.3 Human development index 7.4 Extent of cultural/ sacred protected landscapes: forests, trees, ponds, streams etc.
8. Adequacy of policy, legal and institutional framework	8.1 Existing policy and legal framework for conservation, extraction and utilisation of medicinal plants 8.2 Enabling conditions for participation of communities, NGOs, civil societies; like JFM resolution, transit rules etc. 8.3 Level of investment and priority for research and development of medicinal plants 8.4 Human resource capacity building 8.5 Status of information dissemination and utilisation
<b>Total – 8 Criteria and 32 Indicators</b>	

# The process of policy change

## 7.1 Introduction

In the preceding sections, a number of suggestions and recommendations have been made for enhancing the role of different private sector players in sustainable forest management. Many of these recommendations would require facilitative changes in policy.

However, whilst desirable changes in provisions may be identified, it is less easy to understand and analyse the *process* of policy change – who are the main actors, who/ what acts as a catalyst in bringing about change and what opportunities exist for change to be made. In this section, the process of policy change in the forestry sector is briefly analysed. This process of policy change is illustrated by a case study of one state – Madhya Pradesh – where significant policy change has been brought about in recent years to encourage private sector participation in forestry.

## 7.2 Important players and processes

Policy change is a complex process and involves the interaction of a number of players. In the context of private sector forestry, the following have emerged as the most important players at the national level:

1. Ministry of Environment and Forests
2. Planning Commission
3. Non Government Organisation
4. Forest-based industries
5. Judiciary
6. Funding agencies

It is the mandate of the MoEF and the Planning Commission to formulate national policies. In recent years, the main mechanism adopted by both for moving towards policy change appears to have been through the constitution of committees charged with researching, debating and analysing specific policy issues leading to policy recommendations.<sup>1</sup> In the past few years, both the MoEF and the Planning Commission have constituted a number of such committees. The major ones, along with their mandates, are listed below:

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1. The other main mechanism is commissioned research.



**Table 7.1 Various committees constituted by the Ministry of Environment and Forests and the Planning Commission in recent years to examine forestry issues**

Name of the committee	Mandate	Date of formation	Date of report submission
Rajamani Committee	To examine issues related to forestry in the north-eastern states.	January 1997	September 1997
Pandeya Committee	To review the National Forest Policy 1988 and its implementation.	October 1997	February 1998
Mukherjee Committee	To review afforestation policies and rehabilitation of wastelands.	October 1997	January 1998
Verma Committee	To recommend steps for promoting women's involvement in the forestry sector.	October 1998	April 1999
Chadha Committee	To study and recommend steps for conferring ownership rights of minor forest produce on panchayats following the amendment of the Constitution of India.	October 1997	January 1998
Maslekar Committee	To finalise guidelines for the approval of forest Working Plans.	October 1997	December 1997
Tiwari Committee	To provide recommendations regarding improvement in forestry training.	February 1996	
Expert Committee on JFM	To review people's participation in forest management.	October 1997	February 1998
Saxena Committee	To examine the issue of leasing of degraded forest lands to the industry.	June 1997	October 1998
Bhatt Committee	To formulate a twenty-year action plan for the forestry sector	November 1998	August 2001



While the large number of committees constituted by the government in recent years indicates its keenness for policy change, the actual process of change has been somewhat slow. There has been limited progress on the implementation of the recommendations of the different committees. This is perhaps due to the inability of policy makers to efficiently deal with multiple (and often conflicting) demands on forest goods and services. Another reason for slow implementation of the recommendations of these committees could be lack of active involvement of various stakeholders in their deliberations (most were dominated by the forest bureaucracy) and consequently their recommendations were perhaps not acceptable to all.

Non government organisations and forest-based industries are important stakeholders who have influenced the policy making process in recent years. This has been done in the following manner:

1. Direct lobbying of policy makers (presentations, letter campaigns, workshops)
2. Preparation of analytical papers
3. Participation in, or representations to, committees and other policy fora
4. Agitation (mainly used by NGOs)
5. Legal action

The roles of important players such as the MoEF, Planning Commission, NGOs and forest-based industries are highlighted in the case of leasing of degraded forest lands to forest-based industries (see Box 7.1).

#### **Box 7.1 A broad timeline of debate over leasing of degraded forest lands to industry**

- Lobbying by the forest-based industries for leasing of degraded forest lands for raising captive plantations after the amendment to the Forest Conservation Act (FCA) in 1988 that specifically prohibited leasing of forest lands to private sector companies.
- The demand for leasing of forest lands is rejected by the MoEF citing reasons such as villagers' traditional rights over forests, need for mixed forests and danger of similar demand from others if the pulp and paper industry is leased forest lands. The MoEF advises the industry to get its raw material by establishing direct contact with the farmers.
- The Union Environment and Forests minister states the need for involvement of industries in the regeneration of degraded forest lands. A draft scheme for the involvement of industries is prepared by the MoEF in 1994.
- Stiff opposition by certain NGOs who come together and start a campaign against the proposal. An analytical paper – 'Leasing of forest lands to industry: a policy analysis' is prepared and published by WWF India on behalf of several

NGOs in 1995. This paper questions the validity of all arguments put forth by the industry for leasing of degraded forest lands. Aggressive lobbying is also started by this group.

- Due to intense opposition by several NGOs and influential individuals, the leasing scheme is put on the back burner by the MoEF.
- Intense lobbying by industry for reconsideration of the scheme in 1997. Assurance by the Prime Minister to reconsider the National Forest Policy and make it more industry friendly.
- Representations to the Prime Minister and Union Environment and Forest Minister by CSE (a leading NGO). A letter signed by eminent persons such as Dr. M.S. Swaminathan, former Chief Justice of the Supreme Court, two former Planning Commission members and Secretary General of WWF India was sent to the Prime Minister in October 1997, citing various reasons why forest lands should not be leased to industry.
- Point by point rebuttal of NGO arguments by the Indian Paper Makers Association in January 1998 in a letter addressed to Mr. A.K. Mukherjee, Chairman of the Committee set up by the MoEF to review afforestation policies and rehabilitation of wastelands.
- Mukherjee Committee (GoI 1998b) unable to take a clear stand on the issue, though indicates that there are over 15 million hectares of forest lands that may not regenerate through JFM and would need substantial investment and technological inputs (indirectly hinting at the need for industry's involvement).
- Working Group set up by the Planning Commission submits its report in 1998 (Planning Commission 1998) and recommends against leasing of forest lands to the industry.

NGOs often use agitation and legal action as tools for influencing policies. This is best illustrated in the case of Karnataka Pulpwood Limited (see Box 7.2).

### Box 7.2 The case of Karnataka Pulpwood Limited

Several years ago, the Government of Karnataka decided to lease around 75,000 acres (about 30,350 hectares) of mostly forest lands to a joint sector company (formed jointly by government and private investors) named Karnataka Pulpwood Limited, for raising fast growing pulpwood species. The lease was for 40 years and the lease rent was a token one rupee per acre per year.

A local NGO – Samaj Parivartana Samudaya (SPS) – decided to fight this lease and started mobilising the local people. The argument of SPS was that this proposal would adversely affect the livelihoods of about half a million people.

The campaign lasted a total of eight years. In several places, the plantations of fast growing species raised by Karnataka Pulpwood Limited were destroyed and

local varieties planted in their place. This was called the *Kittiko-Hacchiko* (pluck and plant) initiative.

A public interest writ petition was filed in the Supreme Court and the petitioners challenged the handing over of reserved forest land to a joint sector undertaking, Karnataka Pulpwood Limited, on the grounds of grave ecological damage and disruption of the livelihoods of forest dependent communities. Because of the NGO led campaign, 72 members of the state legislature effectively pressurised the government to abandon the plan.

In recent years, the judiciary has started playing an important and proactive role in matters related to the environment. Such has been the level of judicial activism that several Supreme Court judges have earned the sobriquet of ‘Green Judges’. The judgements of the Courts in several Public Interest Litigation cases have virtually set the policy (see Box 7.3). The courts have extensively referred to and upheld the Public Trust doctrine in environmental cases where the government has failed to perform its statutory duty of protecting the environment.<sup>2</sup>

### Box 7.3 Judicial activism

In recent years, the Judiciary has started playing an important role in matters concerning environment and forests. This is perhaps due to the perceived failure of the Executive to effectively implement the law and safeguard the environment. There has been a spate of public interest writ petitions filed by concerned citizens or activist groups, based on which the courts have issued orders ranging from a ban on green felling in the hills to closure of saw mills near the forests. Some of the recent orders issued by the Supreme Court are listed below:

- The definition of ‘forest’ broadened and Forest (Conservation) Act made applicable to all areas having forest cover, whether legally notified or not.
- No felling in any forest without a Working Plan approved by the central government.
- Complete ban on felling of trees in the tropical wet evergreen forests of Tirap and Changland districts. All wood-based industries in the above area ordered to be closed down.
- Closure of all sawmills within a distance of 100 kilometres from the border of Arunachal Pradesh.
- Movement of timber and timber products from north-east India to any other part of the country completely banned except for purposes of defence or to meet government requirements.
- No private agency to deal in felled trees in the state of Jammu and Kashmir. No permission to be given to sawmills to operate within a distance of 8 kilometres from demarcated forest areas.
- All unlicensed sawmills, veneer and plywood industries in the states of Maharashtra and Uttar Pradesh to be closed immediately.

2. Public trust doctrine essentially means that certain public resources (such as land, running water, air, etc.) are held in trust by the state for the benefit of the people. The state, as trustee for the people, bears responsibility for preserving and protecting the right of the public to the use of these resources for specified purposes.

External funding agencies, such as the World Bank, have also played an important role in influencing forest-related policies, especially in the states where they have provided loans or grants for forestry projects. This is illustrated well through the case of Madhya Pradesh, presented in Section 7.3.

While all players listed earlier in this section do play a part in the policy change process, the judiciary and NGOs have emerged as the most important ones in recent years. The policies pertaining to different environment related matters, including forestry, are virtually being decided by the courts. For instance, when the Himachal Pradesh FD wanted to revoke the ban on felling of trees in high altitude areas, it was unable to do so due to a ban imposed by the Supreme Court. Similarly, when the Madhya Pradesh FD wanted to allow harvesting of trees from private forests, the Supreme Court banned it in response to a public interest writ petition.

The great zeal shown by the higher judiciary in recent years in strictly enforcing environment-related laws is the result of its belief, not entirely misplaced, that due to apathy, inefficiency and corruption, bureaucracy has failed to perform its duties. The mechanism of public interest litigation has proved extremely useful for the activists and NGOs to appeal to the judiciary to intervene in environment-related matters. The NGOs and activists have also got support from the media, though the media's direct role has been limited so far.

The forest-based industries have lobbied hard but have met with limited success on account of the active opposition to their demands from NGOs and parts of the bureaucracy. The judiciary too has not been very sympathetic to their cause, as is evident in restrictions imposed on the operation of various industries near natural forests.

It appears that the bureaucratic mechanism of setting up committees, though used extensively, has had limited impact on policy.

## 7.3 Policy change in practice: a case study of *Lok Vaniki* in Madhya Pradesh

### 7.3.1 Introduction

In this section, the actual process of forest policy change in one state with respect to private sector involvement in forestry is examined in detail. The purpose is to demonstrate how policy change actually takes place in practice. The state of Madhya Pradesh was chosen for the study as significant policy changes have taken place in this state in recent years.

### 7.3.2 Private forests in Madhya Pradesh

The state of Madhya Pradesh is not only territorially the second largest in India but it also has the largest forest area.<sup>3</sup> The state has a large number of private forests, which are mostly small in size. According to one estimate, there are about 800,000 private forest owners in the state owning around one million hectares of private forests.<sup>4</sup> The forest owners generally neglect their forest patches as they get little or no income out of them. This is mainly because the procedures for felling and disposal of trees from private forests (as given in the Madhya Pradesh Land Revenue Code) are cumbersome and time consuming. Thus, even the sale value of the land carrying these forests is low, even lower, in fact, than marginal agricultural land. Thus, forest owners see trees on their land as a hindrance and would prefer to fell them and use the land in some other way.

#### 7.3.3 The *Lok Vaniki* scheme

While the private forests in the state have been virtually ‘locked up’ due to a restrictive legal and policy framework, the gap between demand and *sustainable* supply of forest products has been increasing rapidly over the years. On one hand, this has put the government forests under tremendous pressure leading to their degradation and, on the other, a number of forest-based industries have closed down due to raw material shortage.<sup>5</sup>

In order to address this imbalance, the state government recently decided to encourage greater private sector participation in forestry. Accordingly, a scheme called *Lok Vaniki* (people’s forestry) was started in 1999. The main objectives of the scheme are the scientific management of private forests and promotion of tree cultivation on marginal lands, which are presently lying barren. This is to be achieved by making tree farming attractive to land owners by providing a suitable legal, institutional and market environment.

The three main components of the *Lok Vaniki* scheme focus on (i) increasing production outside the government forests; (ii) creating an institutional framework for managing, supervising and monitoring forestry on non-forest lands; and (iii) research and development.

#### Increasing production

The scheme seeks to increase production by removing restrictions over the management of existing private forests and by encouraging new plantations. It is estimated that out of a total of 8.4 million farmers in the state, 200,000

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3. Prior to its division in November 2000, Madhya Pradesh was the largest state in the country. Now a new state – Chhattisgarh – has been created out of its eastern and south-eastern districts. In this section, unless otherwise specified, all data pertains to the undivided Madhya Pradesh state.

4. According to another estimate, there are about 200,000 private forest owners in the state owning forest patches of above 0.4 hectare (Singh 1998).

5. It is estimated that 14 forest-based industries in the state have been closed in recent years for want of raw material. Several others are running below their installed capacity (Singh 1998).

farmers have a total of about 400,000 hectares of standing forests which can be 'unlocked' immediately. Further, about 600,000 farmers each have about one hectare of degraded forest. The farmers can make this productive without much investment. New commercial plantations on private and revenue wastelands through individuals, associations, co-operatives and companies are also to be encouraged. There is also potential for production of NTFPs such as lac and myrobalans from private lands.<sup>6</sup>

### Creating an institutional framework

The scheme is to be implemented by people themselves through farmers' associations and elected bodies such as *panchayats*. The FD will enrol qualified professionals as chartered foresters, who will provide technical support to land owners for a fee. Initially, there was a proposal to set up forestry boards at state, district and block levels but now a state level coordination committee has been formed instead to oversee implementation of the scheme.

### Research and development

The FD is to coordinate with the forestry research institutes for development of improved planting stock and better plantation management techniques so that tree farming becomes an attractive option for the land owners.

### Anticipated benefits of the scheme

- *Wood production:* It is expected that with the 'unlocking' of the private standing forests, wood production in the state would go up by 100,000 m<sup>3</sup>. By the tenth year, this additional production is projected to be 1 million m<sup>3</sup>. It is also expected that the rehabilitation of the degraded forest and the new plantations will begin to add to this production from the seventh year onwards; and by the year 2020, wood production in the state would be sufficient to meet the demand in a sustainable manner.
- *Financial benefits:* It is expected that with the increased wood production from their land, about 200,000 farmers will begin to get additional income, on average, of about Rs. 30,000 annually. Nearly 600,000 owners of degraded forests will start getting additional income from the seventh year onwards. Another million farmers will get additional income from tree plantations or agro-forestry operations from the tenth year onwards.

In addition, there will be other benefits such as increased employment generation and a positive impact on the environment.

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6. For instance, in Hoshangabad, several hundred acres of private forests are dominated by a tree species *Kusum* (*Schleichera trijuga*), on which lac insects are reared. Owners of these woodlots are willing to have a plan for non-consumptive use of such woodlots. The management objectives for such areas are going to be based on cultivation of lac and not harvesting of trees.

### 7.3.4 The process of policy change

Policy change is a complex and slow process. While the announcement of the *Lok Vaniki* scheme was made in April 1999, the process of policy change leading to the scheme can be traced back to over a decade. Some of the significant events contributing to policy change are listed below.

- Under the USAID sponsored social forestry programme in the 1980s, farmers were encouraged to grow tree crops along with agricultural crops. Four species of trees being planted under this programme were exempted from the purview of the Madhya Pradesh Timber Transit Rules.
- Through a gazette notification on 2 December 1994, the provisions of the Land Ceiling Act were relaxed to permit plantation on private land, and the leasing out of government non-forest wastelands to private companies, registered societies, institutions and individuals for plantation establishment. However, inter-cropping on such land was not permitted.
- The state government provides subsistence forest products, including timber, either free or at highly subsidised rates to the people (called *Nistar*). This has led to degradation of forests on one hand and acted as a disincentive for private producers on the other. The *Nistar* policy was revised on 26 December 1994 and free/ subsidised supply of forest produce was restricted to villagers living within a radius of five kms. from reserve/ protected forests. This amendment partially removed the disincentive to the private sector to produce forestry goods for the market.
- Under the World Bank supported Madhya Pradesh Forestry Project, from 1995 onwards 14 Extension and Research units were set up in different agro-climatic zones throughout the state. These centres have helped to create awareness about clonal forestry and fast growing species and their economics amongst the public. These in a way set the platform for encouragement of private participation in forestry activities by use of improved planting material.
- As an incentive to tree growing on private and community lands, timber transit rules were amended on 28 March 1996. Now, only 16 species of timber require the issue of transit permits. The local *panchayats* have been empowered to issue transit permits for 10 of the 16 species; the FD issues transit permits only for six nationalised timber species.
- To facilitate the procedures for felling of trees on private property, an amendment was made to Sec 240/241 of the Land Revenue Code on 29 July 1997. Prior to this, only the Collector of the district was empowered to grant permission for felling of trees but after this amendment, the Sub Divisional Magistrates can also issue these orders. Further, to encourage replanting of

areas, a procedure was laid down through which, if the farmer registers with the *Tehsildar* and Range Forest Officer, no permission is required at the time of harvest of the trees.<sup>7</sup>

- The concessional supply of raw material from government forest to forest industries was stopped in December 1998, after which the industries had to look for raw material from areas outside government forests.

## Development of the *Lok Vaniki* Scheme

### *Origin of the idea*

The initial idea of policy change to promote private sector forestry came from one individual, Mr. D.P. Singh, then Chief Conservator of Forests, after he visited some private teak forests in 1994 and discovered that these were degrading due to lack of proper care and management. Subsequently, in 1996, after he became the Principal Chief Conservator of Forests (PCCF) – state forestry chief – he appointed a high level committee to probe the issue and to suggest ways for improving the condition of private forests.

### *Estimation of the extent of private forests*

The first task was to estimate the extent of private forests in the state. It was not possible to determine this from land records as these forests have been classified in different categories in different parts of the state. An assessment carried out to respond to a query from the Supreme Court indicated that there were 19,488.6 hectares of private forests in the state. This figure, however, included only patches of forests that were larger than 10 hectares and having 200 or more trees per hectare. There was no reliable information on the extent of smaller patches of forest (up to 10 hectares) owned by individuals.

To make a more realistic assessment, a quick survey was conducted in two forest divisions, Dewas and Hoshangabad. This survey indicated that there were at least 2000 farmers who had forests of over 1 hectare on their holdings. Their total holdings amounted to more than 5000 hectares. Considering that the major forest divisions are much larger than Dewas or Hoshangabad, this indicated that the number of such farmers in Madhya Pradesh is likely to be in hundreds of thousands with a substantial area under private forests. This, in turn, meant that, if sustainably managed, the annual output from these forests could certainly go a long way in addressing the demand-supply imbalance in the state. This exercise resulted in a rough estimate of about 200,000 farmers who have private forests of 0.4 hectare and above.

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7. The Madhya Pradesh Land Revenue Code was further amended in 2001. In the amended code, the powers given to the Sub-Divisional Magistrate were withdrawn and a Sub-Division level Committee, under the Chairmanship of the President of *Janpad* (Block) *Panchayat* will now recommend such cases to the District Collector. Permission for felling of trees under *Lok Vaniki* will remain outside the purview of these Rules.





Photo: Sushil Saigal

A eucalyptus tree being harvested. The *Lok Vaniki* scheme is projected to 'unlock' private standing forests to the extent that within twenty years, state wood production will meet demand

#### *Preparation of management plans for private forests*

Around the same time, an important development took place at the national level. The Supreme Court passed a judgement on 12 December 1996 banning felling of trees in all forests (including private forests) except in accordance with approved working (management) plans.<sup>8</sup> As a consequence of this judgement, it became necessary for private forest owners to prepare working plans for their small private holdings.<sup>9</sup> Subsequently, the FD, at the request of farmers, prepared working plans for three private forests in Hoshangabad, Raigarh and Durg districts. The state and central government approved these working plans in May 1997. However, the private owners still had to go through the process of getting permission to fell trees on their plots from the District Collector as required under the Madhya Pradesh Land Revenue code, 1959. Permission for felling was granted only in Raigarh after nearly two and a half years in December 1999 but unfortunately the Supreme Court banned all tree felling in the state in the same month. This ban came about because of a Public Interest Litigation filed in the Supreme Court, regarding the alleged felling and transport of trees from government forests by falsely showing their origin as private lands.<sup>10</sup>

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8. This judgement was applicable all over the country.

9. Until then, felling of trees on private lands was governed exclusively by the Madhya Pradesh Land Revenue Code of 1959, which does not specify any arrangement for the management of private tree-clad land.

10. This ban has now been lifted (see Section 7.3.5).

### *Economic viability of management of small private forest plots*

The working plans prepared in the three trial cases showed that even small marginal farmers can gain substantially by sustainable management of their small forest patches. For instance, it was calculated that the 6.589 hectares of teak forest in Hoshangabad – for which a working plan was prepared – was capable of yielding returns well above Rs. 50,000 per year. In fact, even a two-hectare patch could yield Rs. 5,000 to Rs.10,000, which is substantial additional income to a marginal farmer. These farmers are presently getting next to nothing from their forest holdings.

### *Visit abroad*

While these developments were taking place, Mr. D.P. Singh got an opportunity in 1997 to visit Sweden, Finland, Brazil and USA. He was impressed by the role that private forestry was playing in the economy of these countries. This visit strengthened his belief in private forestry and he started discussing the possibility of developing private forestry in the state with his colleagues. However, before he could give any concrete shape to his ideas, he retired from his post and it seemed that the private forestry proposal would not develop any further.

### *Preparation of a concept paper*

Fortunately, Mr D.P. Singh had also introduced the idea to the Chief Minister of Madhya Pradesh. The Chief Minister was enthused by the potential that this programme could have for the state, and requested a concept paper and proposal for further consideration. Mr. D.P. Singh was made Forestry Advisor to the state government to allow him to continue developing this concept. He worked with a dedicated team of young officers and prepared the concept paper entitled ‘Socio-economic development in Madhya Pradesh through forestry by the people, for the people’ in June 1998. In this paper, the anticipated benefits of private forestry at hardly any additional cost to the government were highlighted. The draft of the *Lok Vaniki* scheme was also prepared.

### *Cabinet approval of the proposal*

On 24 April 1999, the Cabinet of the Government of Madhya Pradesh formally approved the scheme to encourage private sector forestry. The favourable disposition of the Chief Minister played an important role in countering critics of the approach within the state FD. It was decided to implement the scheme on a pilot basis in four districts – Dewas, Raigarh, Siddhi and Damoh.<sup>11</sup> It was announced that a ‘mission’ approach would be adopted for implementation of the scheme.<sup>12</sup>

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11. The scheme was later extended to 10 districts.

12. Mission approach means that the scheme would be implemented expeditiously with inter-departmental cooperation and the scheme would continue until its objectives are met. Madhya Pradesh has adopted a mission approach for watershed development, education and health also.

### *Creation of the Lok Vaniki cell*

A *Lok Vaniki* cell was created with Additional PCCF (Production) as the mission leader. In July 1999, a high-powered committee composed of senior officials from the *Panchayat*, Tribal, Forest and Revenue departments was set up to look into legal requirements of the *Lok Vaniki* scheme. A task force was also set up to look into institutional arrangements needed to successfully implement the scheme. Further, three sub-committees were appointed by the PCCF to look into the issues of:

1. Structure and function of the forestry boards at the state, district and block levels<sup>13</sup>
2. Guidelines and format for working plan preparation
3. Guidelines for chartered foresters

### *Development of legal framework*

It was noted that to create an enabling legal environment for private forestry in the state, a number of Rules and Acts needed to be amended. These include:

1. Indian Forest Act, 1927
2. Madhya Pradesh Protection of Aboriginal Tribes (Interest in Trees) Act, 1956
3. Madhya Pradesh Sales Tax Act, 1958
4. Madhya Pradesh Land Revenue Code, 1959
5. Madhya Pradesh Forest Produce Transit Rules, 1961
6. Madhya Pradesh Forest Produce (Trade Regulation Act), 1969
7. Madhya Pradesh *Panchayati Raj* Act, 1993



Since it was difficult to amend so many Acts, the high-powered committee set up for this purpose suggested enactment of new legislation to take care of the requirements of farmers who have private forest. Accordingly, 'Madhya Pradesh *Lok Vaniki* (Tree-clad area management) Act, 2001', was approved by the state assembly in 2001.

Some of the unique facilitative features of the *Lok Vaniki* Act are:

- The Act is voluntary in nature and is applicable only to such areas that are brought under scientific management by the owners themselves by preparing a management plan.
- The Act not only recognises village *Panchayats* and *Gram Sabhas* (general body), but also provides for their active involvement in the process of preparation, implementation and monitoring of management plans prepared for private areas.

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13. As noted above, the idea to set up forestry boards has been superseded by the establishment of a state level coordination committee.

- The Act has provided for enrolment of qualified and experienced forestry professionals as chartered foresters to make available paid technical assistance to the private land owners on demand. This is an unprecedented development in the Indian forestry sector.
- The Act provides a 'single window' to deal with the issue of management of such private holdings for which a management plan is prepared under the provisions of the Act. Such lands shall remain outside the purview of the Madhya Pradesh Land Revenue Code 1959, which currently regulates felling of trees in private areas.
- While the Act itself is very progressive, the process for framing rules under the Act was also participatory. The Forest Minister of the state, Mr. Harvansh Singh, chaired several joint sessions of farmers and officials to arrive at a widely accepted framework for developing a 'people friendly' set of *Lok Vaniki* Rules. Thus, perhaps for the first time, the land owners got an opportunity to directly participate in the law making process.

#### *Development of an institutional framework*

- *Farmers' associations:* A series of exposure visits of farmers to Maharashtra state (where there is a strong cooperative movement) has resulted in the formation of district level farmers' associations (*Lok Vaniki Kisan Sangh*) in all 10 districts where *Lok Vaniki* is being implemented. These associations promote collective action and also provide forward and backward linkages to tree farmers. With the help of political leadership, a state level committee (*Lok Vaniki Kisan Samiti*) has also been formed. This committee not only articulates tree farmers' concerns at the highest level in the state but has also started discussions with industry and traders. It also helps the farmers in accessing expert advice e.g. for NTFP production.<sup>14</sup>
- *Chartered foresters:* After the passage of the *Lok Vaniki* Act, chartered foresters are now legally recognised as forestry professionals (who may be outside the FD), who are authorised to prepare management plans for private forests and plantations. This is a major step towards ending the monopoly of the state over forestry science and the forestry profession in the country.
- *Lok Vaniki coordination committee:* A '*Lok Vaniki* Coordination Committee' was formed in the state in February 2001. Chaired by the Chief Minister himself, and with the Forest Minister as the Vice-Chairman, the *Lok Vaniki* Coordination Committee comprises of the Chief Secretary, Secretaries and senior officers of relevant departments as well as members of farmers associations and subject specialists from other relevant fields. It is responsible for the development of a suitable policy, legal and institutional

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14. The state level committee and district associations in four districts have already been formally registered as Societies.

framework to facilitate scientific management of private forests. The composition of this committee indicates the high importance being accorded to this scheme by the state government.

### 7.3.5 Experience with *Lok Vaniki*

The scheme is currently being implemented in 10 districts of the state.<sup>15</sup> Until now 1196 farmers owning 4211 hectares of land from five districts have got involved in the scheme. 105 management plans have already been prepared. A substantial increase in demand for tree saplings was recorded in the districts where the scheme was started. Unfortunately, the scheme received a setback when the Supreme Court banned all tree felling in Madhya Pradesh in December 1999. The state level farmers' committee submitted a review application to the Supreme Court to seek relief for tree farmers. The FD also submitted a petition.

The Supreme Court partially lifted the ban in September 2000 and allowed the felling and transport of timber from government forest as per approved working plans if prescriptions for ensuring regeneration are carried out and budgetary provisions are made for it. An empowered committee constituted by the Supreme Court to look into the whole issue has appreciated the spirit of *Lok Vaniki* and allowed the state government to implement the scheme in its order dated 29 January 2002. This favourable decision is likely to ease the way for successful implementation of *Lok Vaniki*.



### 7.3.6 Analysis of the process of policy change

The process of development of the *Lok Vaniki* policy in Madhya Pradesh serves as an illustration of how policy to support private sector forestry may emerge. Whilst the particular circumstances and conditions (and hence policy responses) will vary greatly in each state, some analysis of the 'how and why' of the process of policy change in Madhya Pradesh may provide useful pointers to other states.

Various theoretical models have been developed over the years to explain how public policy changes. The *Lok Vaniki* case is a good illustration of the model developed by Kingdon (1995) (see Box 7.4).

It is clear that the key 'policy entrepreneur' in the state has been Mr. D.P. Singh – the erstwhile PCCF. He brought private sector forestry to the state government's 'agenda'. He became interested in private sector forestry after he compared the extremely poor condition of private forests in the state to that prevailing in some other countries, notably Sweden, where private sector forestry contributes substantially to the national economy. He felt that Madhya Pradesh could also turn around its economy by encouraging private sector involvement in forestry.

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15. Dewas, Damoh, Sidhi, Hoshangabad, Narsinghpur, Seoni, Jabalpur, Mandla, Katni and Dindori.

### Box 7.4 Kingdon's model of agenda setting, alternative specification and policy formation

The agenda is the list of subjects, issues or problems that the government is paying serious attention to at any given time. There are three families of processes in agenda setting: problems, policies and politics. Certain conditions become defined as problems when we come to believe that something should be done about that condition. Problems catch the attention of decision-makers when there are visible indicators. Constructing an indicator (especially quantitative indicators) and getting others to agree to its worth becomes a major activity of those pressing for policy change.

Independent of the problem processes, specialists, researchers, planners, academicians, consultants etc. are constantly trying to evolve new ideas and concepts and to generate alternatives. These proposals or ideas may not be focussed on any problem but at an alternative way of doing something and may be further refined or rejected after discussions. Flowing independent of the policy and problem stream is the political stream composed of national mood, election results, partisan party politics and changes in the administration. The national mood is something that the people in and around the government sense. National mood changes in discernible ways and these have impacts on policy agendas and outcomes.

A policy window is an opportunity for advocates of proposals to push their pet solution. The three streams mentioned come together at critical times. A problem is recognised, a solution is developed and a political change makes it the right time for policy change. A window opens mainly because of change in the political stream, a change in national mood or new administration.

Policy entrepreneurs are people willing to invest their time, energy, reputation and money to promote a position in return for anticipated future gain. Such people are found in many locations. The key entrepreneur may be a bureaucrat, a politician, a lobbyist, researcher or academic. But they are central in moving the subject up the agenda and into policy change. The entrepreneurs develop their ideas, expertise and proposals and wait for the policy window to open. The entrepreneurs perform the function of coupling the previously separate streams. They hook solutions to problems, proposals to political momentum and political events to policy problems.

Source: Kingdon 1995.

As he was the head of the state FD, Mr. D.P. Singh could initiate steps to translate his vision into reality. First of all, he collected data about private forestry in the state. Using this information, he was able to convince a core group of officers in the FD about the merits of private forestry.

The key to the successful policy change in Madhya Pradesh has been the direct involvement of the highest level of political leadership in the process. Mr. D.P. Singh presented his proposal to the political leadership using 'visible indicators' to define the conditions of the forestry sector in the state and the possibilities of a major contribution from the private sector if certain changes were made in the policy environment. He made comparisons with various developed countries

showing the contribution of the private forestry to their economies. He also emphasised the need to address the crisis in the forest-based industries of the state, with a large number of these closing down and others barely surviving with imported raw materials. Having worked in the government, he was familiar with the thinking of politicians and bureaucrats. He emphasised that there were no financial implications for the government; in fact it would stand to gain through increased tax revenue. He also blended his proposal with the government's priorities in other sectors like decentralisation (*panchayati raj*), liberalisation and privatisation of the economy. It was only due to the political leadership's direct support that Mr. D.P. Singh could continue to pursue this idea even after he retired from the FD.

The 'policy window' opened when the Chief Ministers' party was re-elected in the state elections in September 1998. There was surmise in the media that decentralisation in the forestry sector through formation of JFM and watershed committees had played an important role in the Chief Minister's re-election. Consequently, the *Lok Vaniki* proposal was viewed favourably. Discussions with a visiting Professor from Germany and Mr. Vinayak Rao Patil, who has played a key role in popularising farm forestry among farmers of Maharashtra, further strengthened the Chief Minister's belief in private sector forestry.

As a result *Lok Vaniki* was started in April 1999. It is only due to the firm support from the top political leadership that *Lok Vaniki* survived a serious setback in the form of the felling ban imposed by the Supreme Court, and its future looks promising. *Lok Vaniki* seems all set to prove new dimensions of private forestry in Madhya Pradesh and pave the way for similar developments in other parts of India.

## 7.4 Lessons from the *Lok Vaniki* experience

Policy change is a complicated process that involves a number of players. The recent experience of policy change process in Madhya Pradesh highlights the following points:

- *Integrated approach*: There is a need for an integrated approach to bring about significant policy changes. There is a need for a comprehensive review of all factors constraining the potential contribution of private sector players to forestry.
- *Role of projects*: The initiation of a large number of projects in the forestry sector in recent years has helped to introduce facilitative policy changes. In Madhya Pradesh, for instance, four species were exempted from the purview of timber transit rules in the 1980s when a USAID supported social forestry programme was started. Similarly, several policy changes were made at the time of the start of the World Bank assisted Madhya Pradesh Forestry Project in the mid 1990s.

- *Bureaucratic and political support:* Both bureaucratic as well as political support are essential for effecting policy change. However, whilst bureaucratic support may be obtained through collection, analysis and presentation of appropriate data and information, political support is likely to be more forthcoming if the change process is presented as part of a larger political agenda such as decentralisation of power, liberalisation etc.
- *Role of exposure visits:* While the role of exposure visits for promoting learning at the level of programme implementation is well recognised, the case study of *Lok Vaniki* clearly brings out their potential as a means for influencing policy change. Obviously, the impact would be greatest if individuals motivated through the exposure visit are in a position to either influence policy change or to initiate action on the ground. The formation of farmers' associations after visits to tree farmers' cooperatives in Maharashtra and the start of policy change process after the visit of a senior official to other countries clearly indicate the key role exposure visits can play in the process.
- *Inter-state learning:* There are currently very few opportunities for cross-learning among different states. This has led to a situation in which innovative solutions to certain common problems found in one state are not shared with other states grappling with the same issues. For example, other states could also consider setting up special cells on the lines of the *Lok Vaniki* cell in Madhya Pradesh. The MoEF should take the lead in promoting cross-learning among states.



# Conclusions and recommendations

## 8.1 Is private sector participation needed?

The government has dominated the Indian forestry sector for the past 150 years. Nearly all forests are owned and managed by the government and forestry activities outside the designated forest areas are also closely regulated by it. The role of private sector stakeholders has, until recently, been limited to that of being users only.

There is, however, a growing realisation that the active involvement of private sector stakeholders is needed to address the major challenges facing India's forestry sector: (i) continuing forest degradation (ii) increasing demand-supply gap and (iii) dwindling government resources.

Over half the forest land of the country is in a degraded condition and at least a sixth is virtually devoid of tree cover. The productivity of Indian forests is also quite low as compared to their potential.<sup>1</sup> The growing stock per hectare is only about 40% of the world average, while the growing stock per capita is under 4% of the world average.

The annual demand-supply gap is 37-38 million m<sup>3</sup> in the case of industrial wood and a staggering 121 million MT in the case of fuelwood. A part of this gap is presently being met through unsustainable removals from government forests and other lands.

The MoEF has estimated that an annual budget of Rs. 52.85 billion is needed to fulfil the objective of improving forest cover. Against this, the current annual availability is only Rs. 8.16 billion for the forestry and wildlife sectors. Even taking all other related programmes under different ministries into account, this goes up to Rs. 16.15 billion. Considering the general financial crunch in the government sector, it is unlikely that the budgetary allocation will be significantly increased in the near future. The share of external funding is already as high as 55%, which is not sustainable in the long run. There is, thus, a need to mobilise additional internal resources.

The involvement of private sector stakeholders offers the potential to address all the above challenges. It has been realised that it is not possible to arrest and

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1. However, some of the official figures of productivity can be misleading as they do not take into account the unrecorded removals.



reverse the forest degradation process without active involvement of forest fringe communities. Similarly, given the current emphasis on conservation of government forests, involvement of farmers is a must for increasing production to bridge the demand-supply gap. The involvement of the corporate private sector is necessary to increase the productivity of forests and plantations through research and development. The involvement of private sector players is also needed in bringing in much needed additional investment into the forestry sector.

## 8.2 What is the current role of the private sector?

The foregoing sections clearly show that, in recent years, the private sector has started playing an increasingly important role in addressing these challenges through infusion of three factors of production – labour, land, and capital.

Over 18% of the government forest lands are now being protected and regenerated by around 63,000 FPCs, which are contributing millions of person days every year for the purpose.

Plantations taken up on lands outside the government forests have not only increased the area under tree cover but are playing a significant role in meeting the wood demand of the country. Currently, half the industrial wood supply in the country is coming from non-forest sources with farmers being the main producers. The farmers of just two districts studied (Prakasam and Uddham Singh Nagar) are producing nearly 1 million MT of wood valued at Rs. 1200 million annually.

Several wood-based industries have also started contributing significantly to the sector in the last decade, mainly in the form of research and development on tree improvement and popularising tree planting outside government forest lands. Companies such as ITC BPL have developed eucalyptus clones that have a productivity of 20 – 44 m<sup>3</sup> per hectare per annum under rainfed conditions. Productivity up to 50 MT per hectare per annum has been reported under irrigated conditions. Information gathered from twelve companies indicates that these companies are supplying more than 53 million seedlings annually to the farmers with an estimated annual area coverage of 26,000 hectares. As over a quarter of this area is planted with seedlings of clonal origin, the contribution of wood-based industries towards production of wood on non-forest lands is significant.

Industry and farmers are making substantial investments in the forestry sector every year, which is in addition to the budgetary allocation made by the government. The experience of plantation companies indicates that it is even possible to generate financial resources for the forestry sector from the open market. It is estimated that the plantation companies mobilised anywhere between Rs. 100 to Rs. 250 billion from the open market.

## 8.3 How can the private sector's role be enhanced?

While the private sector has started to play an important role in the forestry sector in recent years, its contribution is not generally understood and acknowledged.<sup>2</sup> As a consequence, the private sector still finds a number of hurdles in its way that prevent it from achieving its full potential. The contribution of private sector players in the forestry sector can be substantially enhanced through removal of existing bottlenecks and provision of positive incentives. The following recommendations are made to help in that direction.

### 8.3.1 Corporate private sector

#### Company-farmer partnerships

- The chances of success of bank loan schemes can be substantially improved if (i) loan and instalment disbursement procedures are simplified and there is greater accountability of the bank officials; (ii) the service charges taken by the companies are kept at a modest level; and (iii) the terms and conditions of the agreement are explained clearly to the participating farmers at the outset. It should also be ensured that all documents are prepared in the local language (apart from English) and copies of these documents are also provided to the farmers.
- Leasing/ share-cropping partnership schemes can be successful if various legal provisions related to land leasing and share cropping, especially in the scheduled (tribal) areas, are simplified and clarified. At present, a number of forest-based industries are located in scheduled (tribal) areas; and there is a need for clarification of certain laws such as those relating to land transfer by tribal farmers. There is also an urgent need to review the legal framework governing the partnerships between the companies and the farmers. The present legal framework was not designed with such partnerships in mind and thus acts as a hindrance in promoting or sustaining partnerships for the purpose of raising long gestation tree crops.
- Formation of tree farmers' associations could help in promotion of partnerships between farmers and companies. The companies would find it easier to deal with such associations rather than individual farmers and perhaps can also enter into long-term supply contracts with them. Farmers would benefit by getting better collective bargaining powers vis-à-vis the companies. This would also facilitate participation of smaller farmers. At present, most companies prefer to deal with large farmers as this reduces their overhead costs. To begin with, possible linkages between wood-based industries and established tree farmers' co-operatives such as NTGCF, IFFDC and Agroforestry Co-operative Federation, Maharashtra could be explored. In future, farmers' associations at the district and the state levels such as those being developed under the *Lok Vaniki* scheme in Madhya Pradesh (see Section 7) could be the model through which farmers and industries could be linked together.

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2. Only the role of forest fringe communities has gained some recognition in the past few years.

## Research and development

- The government should consider providing financial support to companies for carrying out specific research projects. Special incentives such as tax concessions may be provided to the companies that are investing their resources in research and development. This has also been suggested by the Expert Committee set up by the MoEF to review the afforestation policies and rehabilitation of wastelands (GoI 1998b). Such incentives will encourage the private sector to play a more positive role in forestry research and development.
- Currently, there is no system for registration of clones developed by the companies, which acts as a disincentive for them to invest in research and development.<sup>3</sup> There is also no system for the registration of tree nurseries or certification of tree seeds or clonal planting stock. These problems should be looked into urgently. One Expert Committee set up by the MoEF has suggested that ICFRE should play the role of the 'National Seed and Planting Material Certification Agency' (GoI 1998b). This recommendation should be implemented as soon as possible.

## Commercial plantations

- Involvement of the corporate sector in the management of *existing commercial plantations* with the FDCs may be considered. The corporate sector should, however, be charged commercial rates for land and provisions should be made for meeting some of the biomass needs of the communities residing near the plantations. If for any reason, it is not possible for the government to accept this proposal, then at least fresh plantations by the FDCs should be raised using improved planting stock, which can be procured from companies having strong research and development programme and good production facilities. The Andhra Pradesh FDC has begun to procure improved Bhadrachalam clones from ITC BPL for raising fresh eucalyptus plantations.
- For the purposes of land ceiling, forestry should be treated at par with other plantation crops such as tea, coffee and banana for which special exemptions are available. To begin with, such an exemption may be granted for plantations raised on private wastelands.<sup>4</sup>
- The GoI may consider setting up a reforestation fund by allocating the cess funds and 20% of the excise duties collected from paper and other wood-based industries. State governments may levy reforestation fees at 10% of royalty on all forest produce for creation of state level reforestation funds, which should be eligible for matching grants by the central government.

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3. Some of these concerns have been addressed by the passage of the Protection of Plant Varieties and Farmers' Rights Act, 2001. However, much will depend on its effective implementation on the ground.

4. There are some existing schemes in different states under which companies can lease land beyond ceiling limits for raising plantations. For instance, Gujarat started a scheme in 1994 under which companies can lease wastelands up to 2000 acres for raising plantations. One company – Vadilal Industries Ltd. – has leased 316 acres of land under this scheme. A similar scheme exists in Tamil Nadu and a company – Galaxy Crystal – has leased 300 acres of land (Planning Commission 1998).

Financial resources of such reforestation funds should be used only for promoting technology based plantations both by the public sector as well as corporate sector/ joint sector plantation companies, under a well-defined long term policy. A cess on the mining industry operating in forest areas may also be considered,<sup>5</sup> which should also be used to augment the proposed reforestation fund.

- Considering the long gestation period and environmental and developmental benefits of plantations, NABARD should consider lending long-term loans at concessional rates. Direct lending to private sector companies for raising plantations may also be considered. There is a need to consider ways to help growers to insure their plantations at competitive rates of premium.

### **Industrial processing**

- There is a need to make the industrial processing sector more efficient. Incentives for efficient conversion of raw material should be built into the structure of taxes and steps should be taken to encourage and monitor foreign investment in the forestry sector. The government may consider providing concessional credit for technological upgradation.

### **Plantation companies<sup>6</sup>**

- All plantation schemes registered with SEBI should be declared as industry.
- Considering that tax exemption is an important consideration for investors while investing in plantation companies, the government may consider granting tax concessions at least at par with those available for investing in infrastructure projects, even if the income of the investors is not treated as agriculture income for taxation purposes.

### **Information sharing**

- Even though several forest-based industries are grappling with similar issues related to partnerships with farmers and research and development, they are working in isolation with limited sharing of information and experience. There is a need to address this issue. The MoEF, industry associations and institutions such as NABARD should take the lead in this regard.

## **8.3.2 Farmers (farm forestry)**

### **Policy environment**

- There is a need for a countrywide review of all laws and procedures constraining farm forestry. At present, there is wide variation in the initiatives taken by different states. For example, while Andhra Pradesh exempted important farm forestry species such as eucalyptus and *subabul* from the

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5. This has also been recommended by an Expert Committee set up by the MoEF (GoI 1998a).

6. Based on SEBI 1998.

purview of transit rules in 1984, neighbouring Orissa exempted eucalyptus as late as 1992. While Madhya Pradesh gave powers to issue transit passes with respect to certain species to village *panchayats* in 1995 (which reduced the transaction costs in obtaining permission), in other states farmers still have to get these from the Forest and/ or Revenue Departments. There is a need for issuance of a national policy or guidelines on these issues.

- The rules and procedures for felling, transport and sale of major farm forestry species should be totally liberalised, and the local *panchayati raj* institutions should be given powers to issue necessary passes with respect to less common farm forestry species.<sup>7</sup> This will ease the marketing problems for the farmers and reduce corruption and consequently their dependence on middlemen. Policies on interstate transport of farm forestry produce also need to be simplified and streamlined. This will facilitate easy movement of farm forestry produce from production to consumption areas. Currently, even transport of ETPs across the state borders is not easy.
- The existing state monopoly on trade of most commercially important NTFPs should be reviewed with a view to promoting greater private sector participation in NTFP production.
- At present, there is provision in the law that private land planted with trees may be declared as 'forest' (FD n.d.b). The laws governing the transfer, management and use of even private forests are so stringent that the landowner virtually loses control over his land: this acts as a disincentive to tree farming. First of all, there is a need to bring about legislative change to ensure that the farmers raising fresh plantations are freed from this fear. Secondly, the laws governing the management of existing private forests need to be liberalised so that private forestry is encouraged. Currently, there are several restrictions on transfer, management and use of these forests.
- Introduction of positive incentives can go a long way in popularising tree farming. The Chandi Prasad Bhatt Committee, set up by the government (in November 1998) to formulate a twenty year action plan for the forestry sector, has recommended introduction of nationally tradable afforestation credits to encourage tree planting by private land owners. These credits will allow tax benefits to the farmers. The small land owners who do not have any tax liability could sell these credits to others. The government should initiate action to implement these recommendations.

### Research and development

- Identification of suitable trees species has played an important role in the popularity of farm forestry in Uddham Singh Nagar and Prakasam districts.

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7.This will also be in line with national and state policies - as reflected in the 73<sup>rd</sup> amendment to the constitution in 1992, the *Panchayat* (Extension to the Scheduled Areas) Act, 1996 and consequent amendments to the state laws on *panchayats* – which aim for decentralisation of powers over local resources.



Photo: Sushil Satgal

Pulpwood stored in a company depot in Prakasam district. It was only after *Subabul* started being used as pulpwood that its market developed and farmers started planting it on a large scale. If technology is developed to make other farm forestry species suitable for pulpwood (e.g. if eucalyptus can be made easily peelable), their popularity amongst farmers is likely to increase substantially

There is need to identify such suitable species for other areas depending on the local climatic/ edaphic conditions and the cropping practices. So far, very little improvement work has been done on indigenous species. Tree improvement work on promising indigenous species (such as *Kadamb*) should be initiated. Even in the case of popular farm forestry species, there is good scope for improvement through research and development. For instance, there has been virtually no improvement work on *subabul* as a pulpwood species, which is the major farm forestry species in Prakasam district.

- Identification of suitable species and development of a few suitable clones is not going to be enough. It is of utmost importance that continued research is undertaken to develop new clones as sooner or later all clones become susceptible to pathogens. Another way through which tree farming can be promoted is by developing new uses for farm forestry species. One of the reasons for the popularity of poplar among farmers is its versatility as it can be used in match, plywood, plyboard, chipboard, packing and several other industries. This diversified usage has ensured a ready market for the produce of poplar farmers and thus encouraged them to plant it. If other new uses for poplar wood are developed, it will further increase its popularity. For instance, if technology is developed for using poplar as pulpwood, its market

will further increase. Similarly, if eucalyptus can be made easily peelable, its market will increase many-fold and make it more popular with the farmers.<sup>8</sup> This aspect can be seen clearly in the case of *subabul*. *Subabul* was around for several years and it was also being actively promoted as a fodder and wasteland reclamation species. However, it was only after it started being used as a pulpwood that its market developed and farmers started planting it on a large scale in the Prakasam district.

- The impacts of farm forestry go beyond an increase in the raw material supply. Often the ground water resources, agriculture and even local climate are affected if farm forestry is adopted on a large scale in an area. Although these impacts are going to be critical to the long-term success of farm forestry, these have not been properly studied. These need to be studied in detail by an independent body.
- The important role of the private sector in research and development has already been discussed. However, as the private sector is likely to concentrate on species having commercial uses and on research and development having direct applications, the government research institutions should concentrate on other areas where private sector is unlikely to take much interest, such as in developing varieties which can bring poorer farmers into the ranks of farm foresters. Collaborative research projects between government institutions and companies should also be encouraged. The government budget for forestry research, which was a meagre Rs. 225 million per year during the VIII Five-Year Plan, needs to be substantially increased.

### Review of subsidies

- There is ample evidence to show that the success rate of seedlings supplied either free or at heavily subsidised rates is low. Still, the bulk of government funds meant for farm forestry promotion are spent on production and distribution of a very large number of heavily subsidised seedlings. Between 1990-91 and 1997-98, government agencies distributed a total of 9.309 billion seedlings. In 1997-98 alone, 1.033 billion seedlings were distributed across the country (GoI 1999). There is very little attention paid to the quality aspects and generally these seedlings do not perform well in the field. There is an urgent need to review this policy. Some of the resources devoted to providing subsidies should be reallocated for developing and producing better and higher yielding clones, which may be supplied in smaller numbers and at higher rates to farmers willing to invest in farm forestry.<sup>9</sup> This should be backed by suitable extension efforts such as setting up of demonstration plots, farmer to farmer contact, etc. This effort may initially be started in

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8. It has been reported that this technology has actually been developed recently and that this has led to a jump in the demand for eucalyptus wood (Chaurasia 2000).

9. Farm forestry in the commercialised agriculture areas is likely to be mainly based on improved or clonal plants in the future. As a result of the higher productivity of clonal plantations, most companies engaged in forestry extension prefer clonal plantations since they can meet their requirements from a much smaller area and thus have to deal with fewer farmers, thereby saving on their extension costs.



selected high potential districts, where farmers are more likely to be willing to pay higher rates for better clonal plants. The existence of demand for better clonal seedlings is indicated by the current good sales of clonal plants by private sector companies even though they charge high commercial rates.

### Farm forestry markets

- As more farmers take to farm forestry, a system of market regulation along the lines of agricultural markets needs to be put in place. In the absence of such a regulatory mechanism, the volatility of markets may result in collapse. While the AMC system introduced in Andhra Pradesh is a laudable first step, much more needs to be done to adequately regulate the farm forestry markets and to protect the interests of both producers and consumers of farm forestry produce.
- In addition to the regulation of wood markets, a suitable market information system along the lines of agricultural markets should be introduced to inform the farmers regarding major buyers, prevailing prices at different places, trends and procedures, etc.
- While the cases in which industry is supplied raw material at concessional rates need to be reviewed, there is also a need to consider whether the government should continue to raise farm forestry species on forest lands that can be grown more easily and efficiently by the farmers on their farm lands. Apart from affecting the farmers' market directly (as was seen in Uddham Singh Nagar), this also acts as a hindrance to liberalisation of felling and transit rules pertaining to these species. For instance, in May 2000, the Orissa government reintroduced the regime of timber transit permit in the three districts of Koraput, Nawarangapur and Malkangiri mainly to control pilferage from the eucalyptus plantations raised on forest lands. However, this is likely to discourage tree planting by the farmers.
- The government may consider revoking the ban on export of wood-based products and imposing a higher duty on import of wood-based raw material to safeguard the interests of the domestic producers. Industry may be given some concessions in excise or sale tax. In this way, domestic production will be encouraged and industries will also have greater incentive for improving wood conversion ratios and overall efficiency and competitiveness. Contrary to the common perception that the scope for increasing duties is severely limited by obligations to the WTO, the bound rates for several items are much higher than those applied.<sup>10</sup>

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10. Where there is political will, such measures can be easily implemented as has been demonstrated by the government in the case of agricultural products. In order to safeguard the interests of farmers, government has recently increased the tariff barriers for a number of agricultural products - 70-80% duty has been imposed on rice; 50% on wheat, duty on sugar has been increased from 25% to 60% within the last six months; duty on edible oil has been increased four times during the past 15 months; import duty on crude edible oil has increased from 15% to 75% and that on refined edible oil from 25% to 85% (Government advertisement in *The Times of India* dated 8 March 2001).



A tractor trolley overturned due to overloading. A regulatory mechanism is necessary to prevent the volatility of farm forestry markets resulting in collapse

- The government also needs to reconsider some of the existing trade policies that stifle private initiative. For instance, in several states government is the monopoly purchaser of major tree species. In Himachal Pradesh, government is sole agency to purchase all forest produce. Such controls limit the marketing opportunities for growers and often lead to the development of parallel markets. State monopolies in the trade of forest produce need to be reviewed in the current context of industrial liberalisation in the country. In several states, concessions on wood produce are given to government departments. Similarly, items such as fuelwood are sold to the general public at subsidised rates. The practice of subsidised supply to government departments must be stopped and instead of subsidising forest produce to the general public, it should be targeted at poor households through the public distribution system.

### Region specific focus

- In a vast and varied country like India, one cannot have a single strategy for the entire country. Available experience shows that farmers in different regions have different reasons for adopting farm forestry. Commercially oriented tree production on farms is more likely to succeed in areas with commercialised agriculture where farmers are relatively more enterprising, can afford to take risks and are used to raising cash crops. In areas that are characterised by subsistence oriented agriculture, farmers are more likely to accept trees that can be integrated into their farming systems without affecting their food security. The future private sector and government policies and schemes should be developed keeping this in mind. Rather than spreading resources too thin by having a uniform strategy for the whole country, a commercial farm forestry strategy should be developed focussing

on selected high potential districts. For the subsistence agriculture areas, a separate strategy primarily focussing on trees for home or local consumption should be developed.

### **8.3.3 Communities (Joint Forest Management)**

#### **Strengthening JFM**

- The JFM programme needs to be strengthened by providing a legal basis for it. The existing administrative orders for JFM in different states (which can be withdrawn or changed by the FD at any time) should be replaced with rules issued under the State Forest Act or some other relevant Act. The possibility of declaring JFM forests as ‘village forests’ under Section 21 of the Indian Forest Act should be explored.
- The FPCs should have a proper legal identity. These should be registered as societies, cooperatives or trusts under the relevant legislation (as against FPCs being merely registered with the FD in several states). The agreement signed between the FD and the FPC should also be of formal nature.
- The share in the forest produce and income offered to the FPC members should be adequate to maintain their interest in the programme. The FD should not look upon JFM forests as a source of revenue and the maximum possible share should be given to the communities to sustain their interest in the JFM programme.



#### **Focus on subsistence and ecological needs**

- Meeting subsistence needs of forest-dependent communities should be unambiguously stated as the first charge on JFM areas. Only surplus production should be considered for commercial use.
- Ecologically fragile areas brought under JFM should not be considered as a source of commercial production.

#### **Demand analysis**

- The presumption that there is existing unsatisfied demand for all forest products does not seem valid. In several areas, the product mix coming out of JFM forests may have to be adjusted to suit the market demand. Alternately, the option of setting up/ relocating processing units should also be explored.
- The demand-supply situation should be analysed at the local level, since aggregated national figures for demand can be misleading. Transport costs and state-level restrictions, such as transit passes, mean that much of the demand for products from JFM forests can only be met from local supplies.

## Policy environment

- Like farm forestry, commercial production from JFM areas will also be promoted if subsidised supply of raw material to industries is further reduced and a higher tariff is imposed on imports.
- Policies constraining commercial production from JFM areas should be reviewed. For instance, procedures for movement of forest products across state borders should be simplified.
- NTFPs are an important produce of JFM areas. The state monopoly on the trade of most commercially important NTFPs such as *tendu*, *sal* seeds and resin should be removed.

## Corporate-community partnerships

- The recent experiments in Andhra Pradesh and Tamil Nadu with respect to provision of bank credit for JFM and linking of FPCs with industries should be closely monitored. Other states should also explore possibilities of obtaining NABARD credit for supporting JFM.

## 8.3.4 Ayurvedic industry

### Assessment of the resource and current level of utilisation

- While an inventory for timber and fuel production is carried out at frequent intervals, there is no such inventory for medicinal plants. In view of the growing economic, social and ecological importance of medicinal plants, it is essential that inventory methods be evolved through research and development. Commercially important medicinal plant resources should be inventoried to get the picture of production potential, their conservation status, use practices, etc.
- There is currently no mechanism to accurately estimate the quantum of medicinal plants used by the ayurvedic industry. A comprehensive survey of the quantum of medicinal plants used, along with the sources of supply, should be carried out. A ready reference guide for correlating trade names of medicinal plants to their botanical names should be prepared to help estimate the volume of trade of different species.

### Measures to control unsustainable harvests and improve production

- Unsustainable and destructive extraction has been widely reported. In the absence of full knowledge of sustainable harvesting regimes for different products, at least 50% of the fruits, roots, leaves, flowers and other materials collected should be left on the plant for future regeneration.
- There is a need to control premature harvesting of products such as fruits of *Emblica officinalis*. An initiative in this direction in Madhya Pradesh has shown positive results.



Photo: Jeff Campbell

Trader selling NTFPs, West Bengal

- Value addition and processing at the collector level should be encouraged so that the collectors can earn the same amount of income from much less quantity.
- Direct links between the processing industry and primary collector/ cultivator should be encouraged.
- Forest areas from where medicinal plants are extracted should be brought under sustainable forest management practices. Application of criteria and indicators, developed under the Bhopal-India process, will help to track progress towards sustainable forest management. In particular, the proposed eight criteria and related 32 indicators of relevance to medicinal plants may be applied with suitable local modifications.
- Application of criteria and indicators is most likely to be effective if it is market-driven. It may be more realistic to start with a voluntary code of practice for the production of ayurvedic medicines, complemented by education of both consumers and producers. However, it depends upon industry and/ or consumer organisations to initiate this. The identification and organisation of buyers who demand certified products would ultimately bring greater market access and higher prices for industry, and assured quality for consumers. The current thrust of the Planning Commission on increasing the exports of the ayurvedic formulations should be used as opportunity for exploring niche markets for certified ayurvedic products.
- Given that the collection and trade of medicinal plants are highly unorganised at the local levels, it is recommended that local level institutions such as FPCs need to be strengthened, so that the cultivation and conservation of medicinal plants may be integrated into the JFM arrangements. With proper micro-credit facilities and training, micro-enterprises can be developed by these FPCs. A few initiatives in this regard have already been started in some states.
- At present, export of prohibited plants (29 species including those mentioned in appendix I and II of CITES<sup>11</sup>), is possible if these are present in some formulation (as against raw form) or if the label of the formulation does not mention the name of the species. This policy should be urgently reviewed.<sup>12</sup>

### Cultivation

- A comprehensive review regarding the current status of cultivation of medicinal plants in the country should be carried out. Existing bottlenecks being faced by farmers as well as companies should be identified and removed.

11. CITES: Convention on International Trade in Endangered Species

12. Ministry of Commerce notification no. 24 (RE-98)/1997-2002 dated 14 October 1998. The term "formulation" includes products, which may contain portions/ extracts of plants on the prohibited list but only in unrecongnisable and physically inseparable form.

- Large-scale cultivation of important medicinal plants has been tried in different regions of the country. These practices have often used very heavy doses of inputs such as chemical fertilisers, pesticides, etc. There is little information on the likely impact of these inputs on the medicinal properties of the plants. Until the results of further research on such impacts become available, large-scale cultivation should be taken up with caution. It is recommended that the certification criteria of WHO (GAP: Good Agricultural Practices) be applied for the products from *ex situ* sources.

### **Institutional responsibility for medicinal plants**

- There is a plethora of organisations dealing with various aspects of medicinal plants. There is a need for a nodal organisation at national level to bring together various stakeholders and to deal with the entire range of issues pertaining to medicinal plants. It is hoped that the recently constituted Medicinal Plants Board would fulfil this role.
- In the absence of specific legal and policy provisions pertaining to conservation, development and utilisation, much unsustainable harvesting and other malpractices (adulteration, premature harvesting, use of substandard raw material, lack of scientific validation-certification etc.) are going on. The Medicinal Plants Board should frame appropriate legal and policy frameworks to address these problems. The Medicinal Plants Board will have to work closely with the proposed National Biodiversity Authority and the State Biodiversity Boards in this regard. The emphasis should be on facilitating sustainable harvests and management methods instead of merely regulating production and supply.
- It is generally felt that, despite the impacts of the supply crisis, industries are not showing adequate concern towards conservation and sustainable supply of raw material and the well-being of collectors. It is recommended that the proposed nodal agency should bring together all interested parties i.e. the government agencies (Forest and Agriculture departments), industries, collectors/ growers, NGOs etc. The nodal agency should ensure flow of information and develop participatory approaches for future development. It must be realised that it is in the interest of all stakeholders and the country that the science of ayurveda flourishes and its returns are shared by humanity at large, nationally and internationally.

### **8.3.5 Corruption**

Like in other sectors of the economy, corruption is an issue in the forestry sector also, which curbs private sector initiative. The corruption indices appear to be highly correlated with measures of bureaucratic inefficiency – the more red tape the more corruption (Hill 2000). Thus, the level of corruption can be reduced if (i) procedures are simplified and red tape is reduced and (ii) transparency is promoted. As a first step, a nation wide review of existing rules and regulations pertaining to various aspects of private sector participation (for instance farm

forestry) should be undertaken; and these should be rationalised and simplified, keeping practical realities in mind. Efforts should also be made to make private sector players (such as farmers) aware of the simplification and rationalisation, so that they are not harassed by unscrupulous officials. There is also a need to make FD staff more accountable and speed up decentralisation efforts (such as giving greater powers to the *panchayats*).

## 8.4 What does the future hold for the private sector?

The era of economic liberalisation that started in the early nineties has resulted in a greater role for the private sector in almost all spheres of life in India – from television to infrastructure development. However, the forestry sector continues to be controlled by the bureaucratic machinery. The challenges facing the sector are immense and bureaucracy cannot handle these alone. Over half the forest lands are degraded and at least a sixth are virtually devoid of tree cover. The productivity of forests is very low and growing stock per hectare is only 40% of the world average. The gap between annual demand and sustainable supply is 37-38 million m<sup>3</sup> in the case of industrial wood and a staggering 121 million metric tonnes in the case of fuelwood. This gap is currently being met largely through unsustainable removals from government forests and other lands. The Ministry of Environment and Forests has estimated that an annual budget of Rs 52.85 billion is needed to fulfil the objective of improving forest cover. Against this, the total current availability is only Rs 16.15 billion.

144

The previous sections clearly demonstrate that private sector players – the corporate sector, farmers and communities - are contributing significantly to the Indian forestry sector. However, their current contribution is far below their potential. It would not be an exaggeration to say that their contribution is not the result of, but in spite of, existing forestry sector policies. There is a need to loosen bureaucratic control and to simplify procedures to allow the private sector to contribute more effectively. There is also a need to promote transparency, which will curb the corruption that plagues forestry like most other sectors in the country.

A number of specific recommendations to enhance the private sector's role have been made in this section. Some of these will require policy change. Much can be learned from the *Lok Vaniki* experience in Madhya Pradesh. If a 'mission' approach is adopted by national policy makers, the private sector could quickly develop to meet the country's requirements for forest produce. Indeed if this path is taken, India could easily emerge as a major exporter and world player in forestry.



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# Annexes

## Annex 1 Forestry sector players

### Government: Central level

#### Ministry of Environment and Forests<sup>1</sup>

At the central level, MoEF is the nodal agency for policy formulation, planning, promotion and coordination of forestry development programmes.<sup>2</sup> There are eight Divisions of the MoEF that relate to forestry and wildlife *viz.*: (i) Forest Conservation (ii) Forest Policy (iii) Survey and Utilisation (iv) External Assistance Projects (v) Research and Training (vi) Indian Forest Service (vii) Forest Protection, and (viii) Wildlife. In addition, there are three Directorates for (i) Project Tiger (ii) Project Elephant, and (iii) Animal Welfare. The regional offices located in Lucknow, Bhopal, Bangalore, Shillong, Bhubaneswar, Ranchi and Chandigarh are primarily responsible for the implementation of the Forest (Conservation) Act, 1980, and monitoring of Working Plans, centrally sponsored schemes, and the Environment (Protection) Act, 1986. The Wildlife (Protection) Act, 1972 and provisions of the *Convention on International Trade in Endangered Species* are enforced through regional wildlife offices located in New Delhi, Mumbai, Calcutta and Chennai and sub-regional offices at Guwahati, Kochi and Patna, with the help of state wildlife wings and the Customs Department (GoI 1999).

#### National Afforestation and Ecodevelopment Board

The National Afforestation and Ecodevelopment Board, within the MoEF, formulates policies and ensures coordination of the nation wide forestry programmes (especially afforestation on government forest lands) being implemented by the state FDs. It also provides funds to the state governments through centrally sponsored schemes.

#### Department of Wastelands Development

While the National Afforestation and Ecodevelopment Board looks after the government forest lands, the responsibility of afforesting and developing non-forest wastelands lies with the Department of Wastelands Development in the Ministry of Rural Areas and Employment.

#### Forest Survey of India

The assessment of forest resources including monitoring of forest cover, inventory of selected areas and preparation of thematic maps is carried out by the Forest Survey of India, which has its headquarters at Dehradun and regional offices at Bangalore, Calcutta, Nagpur and Shimla.

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1. MoEF has a number of institutions under its administrative control. Some of the important institutions are listed separately.

2. MoEF was formed in 1984. Before its creation, the Ministry of Agriculture looked after forestry matters at the Central level.



### **Botanical Survey of India**

The Botanical Survey of India was established in 1890 with the objectives of surveying and identifying the plant resources of the country. It has its headquarters at Calcutta and has nine Circles located in different phyto-geographical regions of the country. It conducts surveys of plant resources, carries out taxonomic studies and prepares floras of the different regions of the country. It is also involved in *exsitu* conservation of plant resources.

### **Zoological Survey of India**

The Zoological Survey of India was established in 1916 with the main objective of carrying out surveys of the faunal resources of the country. It has its headquarters at Calcutta and has sixteen regional stations located in different parts of the country.

### **Indian Council of Forestry Research and Education**

The central government plays a key role in research and education in the forestry sector. The Indian Council of Forestry Research and Education was established in 1986 and currently has a network of ten research institutes and centres. The most prominent of these is the Forest Research Institute located at Dehradun (GoI 1999).

### **Other national research and training institutes**

There are a number of important central government institutions outside the Indian Council of Forestry Research and Education network also such as the Indian Institute of Forest Management (Bhopal), the Indian Plywood Industries Research and Training Institute (Bangalore), and the Wildlife Institute of India (Dehradun). The Indira Gandhi National Forest Academy at Dehradun provides in-service training to Indian Forest Service officers. There are three State Forest Service Colleges at Barnihat, Coimbatore and Dehradun. One Ranger Training College at Kurseong is also run by the central government. Several agriculture universities (central as well as state) also have forestry faculties.

### **Hindustan Paper Corporation**

The Hindustan Paper Corporation is an autonomous corporation under the Ministry of Industries. It controls six pulp and paper mills out of which only five are currently being operated. All units except one (Hindustan Newsprint Limited) are running at a loss. The Andaman and Nicobar Island Forest Plantation Corporation is also run by the central government.

### **National Bank for Agriculture and Rural Development (NABARD)**

NABARD is an apex developmental bank with the mandate of promoting agriculture and integrated rural development. It is the major financial institution that provides support for forestry projects in the country.

The major roles of NABARD include: (i) re-finance support to cooperative and commercial banks to increase production, productivity and employment generation in the rural areas; (ii) support for meeting credit requirements of farmers through the Cooperative and Regional Rural Banks; and (iii) support for microfinance initiatives, particularly through NGOs and Self Help Groups (SHGs).



NABARD started providing support for the JFM programme in 1999. The first project has been sanctioned in Andhra Pradesh for a three year period with a financial outlay of about Rs. 550 million and covering 918 FPCs (Haque 2000b).

### **Tribal Cooperative Marketing Development Federation**

The Tribal Cooperative Marketing Development Federation (TRIFED) is an organisation under the Ministry of Tribal Affairs. It was set up in 1987 to help in the marketing of agriculture and forest produce of the tribal communities. It is an apex level federation of State Tribal Development Cooperative Federations and State Forest Corporations.

It has so far undertaken marketing of about 80 products developed by the tribal communities. During 1998-99, TRIFED procured tribal produce worth Rs. 319.24 million. During the same year its domestic sale and export figures were Rs. 357.78 million and Rs. 134.03 million respectively. TRIFED is the canalising agency for exports of gum karaya (*Sterculia urens*) and niger seed (*Guizotia abyssinica*), meaning that all exports of these products have to be routed through TRIFED. It is also the registering authority for lac exports (TRIFED n.d.).

## **Government: State level**

### **Forest Departments**

Each state and union territory has its own FD. The FD is entrusted with the responsibility of forest administration, enforcement of forest-related laws and implementation of forest policy objectives and strategies. It is also responsible for implementation of the government's forestry programmes and regulation of flow of forest products for local or commercial use. The forests are usually organised in Circles, Divisions, Ranges, Sections and Beats for the purposes of administration and management.

### **Forest Development Corporations**

These public sector corporations (commonly called FDCs) were created in most states as a result of the recommendations of National Commission on Agriculture, whose report came out in 1976. Their main objective was to raise high-yielding industrial plantations on forest lands after clearing 'low value' natural forests. However, after the issuance of the new forest policy and the ban imposed on clearfelling of natural forests in 1988, these corporations are either involved in afforestation of wastelands or in harvesting and marketing of forest produce. Some states have also established separate government-owned corporate bodies for development of pulpwood and processing of wood and NTFPs e.g. Kerala Bamboo Corporation, Bihar Lac Board.

### **State level research and training institutions**

Some state governments have established their own research institutes. The notable ones are the Kerala Forest Research Institute, Peechi and the Madhya Pradesh Forest Research Institute, Jabalpur. Five Ranger Training Colleges are also run by the state governments.

## Private Sector

The role of the private sector in forestry has undergone considerable change over the past century. In the early twentieth century, only 26.76 million hectares of forests had been declared as reserved or protected forests by the government and the rest belonged to the princely states or feudal lords. The area of forests under government control increased to about 40.48 million hectares in 1950-51 and reached 66.80 million hectares in 1976-77 through a process of acquisition, merger and reservation (GoI 1999). The area presently under government control is 76.52 million hectares.

While private ownership of large blocks of forests was virtually abolished by nationalisation of forests, many farmers continued to raise trees on their farms and homestead lands for meeting their own subsistence needs or for sale of tree products in the market. The government also encouraged tree planting by farmers through the massive social forestry programme launched in the mid-1970s.

At present, the non-state players in the forestry sector include corporate entities (industries using forest-derived raw material, plantation companies, etc.), local communities, forest produce traders, farmers practicing farm/ agroforestry, forestry cooperatives, NGOs and funding agencies.<sup>3</sup>

### Private sector nurseries

A large number of privately owned tree nurseries have been established, especially in the areas where farm forestry is popular with the farmers. Some large companies have also started research and development efforts for genetic improvement of trees and are preparing and selling improved planting stock. The two most notable efforts are those of Wimco Limited with poplar in north west India and ITC Bhadrachalam Paperboards Limited with eucalyptus in Andhra Pradesh.

The total production of poplar ETPs in the private sector nurseries is estimated to be around 12 million per year (Chandra 2000). ITC Bhadrachalam Paperboards Limited is currently producing about 2.7 million clonal eucalyptus seedlings per year and plans to increase it further.

### Traders

Most of the trade in forest products, especially NTFPs, takes place through private sector channels. The network of traders starts from the collection agent at the village level and ends at large traders and exporters in cities like Delhi and Mumbai. There are six major medicinal plants markets in India, each having at least 25 large traders, who have individual annual turnovers in excess of Rs. 5 million. There are 21 medium markets, each having 25-50 traders. Each of these traders has an annual turnover of between Rs. 2.5 and Rs. 5 million. There are a number of smaller medicinal plants markets and if one

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3. The role of wood-based and *ayurvedic* industries, external funding agencies, farmers, local communities and plantation companies has already been mentioned in Section 1.2.3 and thus is not repeated here.

includes village level middlemen and collection agents, the number of traders involved is surely likely to run into tens of thousands.

### **Tree growers' cooperatives**

In the past two decades, some attempts have been made for promotion of tree growers' cooperatives. Out of these, three significant attempts are briefly described below:

#### **National Tree Growers Cooperative Federation Limited**

The National Tree Growers' Cooperative Project was started by the joint initiative of the National Wastelands Development Board and National Dairy Development Board (NDDDB) in 1986. The National Tree Growers' Cooperative Federation Limited (NTGCF) was formed to implement this project. The main idea behind its formation was to utilise the rich experience of the NDDDB in the field of milk cooperatives for promoting tree cultivation by farmers through formation of tree growers' cooperatives. The activities of NTGCF received support from the Swedish International Development Authority in 1991 and Canadian International Development Agency in 1993.

Up until 1996, NTGCF had assisted in the formation of 362 Tree Growers Cooperative Societies with over 33,000 members and covered 12,300 hectares area in five states. The NTGCF currently operates in six states: Gujarat, Andhra Pradesh, Orissa, Rajasthan, Karnataka and Uttar Pradesh (NTGCF 1996).

#### **Indian Farm Forestry Development Cooperative Limited**

Indian Farmers' Fertiliser Cooperative Limited (IFFCO) is a fertiliser manufacturing organisation, which is owned by over 30 million farmers and 30,000 Cooperative Societies. It started a farm forestry pilot project in 1986-87. The project covers Sultanpur, Raebareilly, Pratapgarh and Allahabad districts in Uttar Pradesh, Sagar district in Madhya Pradesh and Udaipur District in Rajasthan. Up until now, a total of 4609 hectares of land has been afforested by organising 32 Primary Farm Forestry Cooperative Societies with a total membership of 4730.

The Indian Farm Forestry Development Cooperative Limited (IFFDC) was registered in 1993 and since then has been managing the IFFCO's pilot project on farm forestry. The project is supported by the India Canada Environment Facility (IFFDC, n.d.).

#### **Agro forestry Cooperative Federation, Maharashtra**

Due to the efforts of one Mr. Vinayak Patil, eucalyptus farming has become very popular in Nasik and 29 other districts of Maharashtra. He first formed a eucalyptus growers' cooperative in Nasik in 1983. Subsequently, 25 other such cooperatives were formed in other districts. 2478 farmers of the Nasik cooperative planted over 16 million eucalyptus trees over a period of eight years. In 1990, Mr. Patil formed the Agro forestry Cooperative Federation of Maharashtra.<sup>4</sup>

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4. Based on citation of the *Indira Priyadarshini Vrikshmitra Award* granted to Mr. Patil.

## Non Government Organisations

In recent years, NGOs have emerged as important players in the forestry sector. NGOs are active in fields such as rural development forestry, environment, biodiversity, research and development and policy advocacy. Many NGOs receive financial assistance from national as well as international funding agencies. The National Afforestation and Ecodevelopment Board under the MoEF runs a grant-in-aid scheme for providing 100% financial assistance to NGOs for raising plantations on public and private wastelands adjoining forest areas. A provision of Rs. 95 million was made for this scheme during the Eighth Five-Year Plan (1992-97). The available figures indicate that during the plan period, Rs. 75 million was spent for raising plantations over 12,630 hectares (GoI 1999).

The NGO community in India is diverse with considerable variation in their size and area of operation. The range is from tiny NGOs operating at the level of one or a few villages to large national level NGOs. In between these two extremes are NGOs operating at block, district, state and regional level. These NGOs also vary widely in terms of their ideology and strategy.

It is very difficult to estimate the total number of NGOs, especially as many of the smaller ones may not even be registered. One estimate puts the number of small NGOs at over 1 million (Pant *et al* n.d.).



The directory of environmental NGOs prepared by WWF-India in 1994 lists 1471 environmental NGOs. Almost all of these are reportedly working on forestry related issues. Out of these, 241 have listed forestry as one of their significant activities (WWF 1994).

## Annex 2 Details of the plywood industry

**Table A2.1 State-wise number and capacity of medium and large plywood units (as on 1 January 1997)**

State	No. of units	Total annual capacity (m <sup>2</sup> )
Andaman and Nicobar Islands	3	10,306,654
Andhra Pradesh	1	1,500,000
Arunachal Pradesh	9	30,674,400
Assam	22	44,512,458
Karnataka	8	9,748,580
Kerala	8	8,790,277
Madhya Pradesh	2	5,750,000
Maharashtra	2	1,437,000
Meghalaya	1	2,600,000
Nagaland	2	4,200,000
Rajasthan	1	1,500,000
Uttar Pradesh	1	558,000
West Bengal	2	2,716,000
<b>Total</b>	<b>62</b>	<b>124,293,369</b>

**Source:** Federation of Indian Plywood and Panel Industries

**Table A2.2 State wise number of plywood units in the small-scale sector**

State	No. of units
Andhra Pradesh	14
Arunachal Pradesh	8
Assam	23
Bihar	48
Delhi	16
Goa	4
Gujarat	14
Haryana	12
Himachal Pradesh	3
Jammu and Kashmir	3
Karnataka	44
Kerala	44
Madhya Pradesh	8
Maharashtra	17
Manipur	1
Nagaland	2
Orissa	3
Punjab	12
Rajasthan	7
Tripura	3
Tamil Nadu	14
Uttar Pradesh	47
West Bengal	71
<b>Total</b>	<b>418</b>

**Source:** Federation of Indian Plywood and Panel Industries

## Annex 3 Funding situation

Both the government and the private sector provide funding for forestry activities in the country. These are discussed below.

### Government sector

The funds for the forestry sector are provided by the central government as well as the state governments. The Planning Commission, MoEF, State Planning Boards and Commissions and the State FDs are the main agencies involved in the planning and funding of the forestry sector.

The main planning system at the national level is that of the Five-Year Plans, which cover all sectors of the economy. The annual plans are then discussed and finalised within the broad objectives and approach of the Five-Year Plans. A part of the funding needed for forestry in the Five-Year Plans is provided by the central government. Depending on the needs of the state and the budgetary resources available from various sources, state governments usually fund some of their own forestry projects. The non-plan expenditure is met by the state governments.<sup>5</sup>

Based on the funding sources, forestry projects in the government sector can be classified as below:

1. Central sector projects (of national/ regional significance)
2. Fully funded state projects
3. Centrally assisted projects
  - fully assisted (by the MoEF and other ministries)
  - partially assisted (by the MoEF and other ministries)
4. Externally aided projects

### Financial outlay in the Five-Year Plans

The outlay for forestry in the Five-Year Plans has usually been less than 1% of the total plan outlay. The outlay for forestry in the VIII Five-Year Plan (1992-97) was about Rs. 40 billion or around 0.94% of the total plan outlay. The current annual outlay for plan and non-plan expenditure is estimated to be around Rs. 8 billion and Rs. 7 billion respectively (GoI 1999). This roughly corresponds with the outlay for the IX Five-Year Plan. The outlay for forestry and wildlife in different Five-Year Plans is given in Table A3.1.

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5. There are two components of expenditure – plan and non-plan. Plan expenditures are estimated after discussions between ministries and the Planning Commission. Plan Expenditure is designed for asset-building and infrastructure projects. Non-plan revenue expenditure is accounted for by interest payments, subsidies (mainly on food and fertilisers), wage and salary payments to government employees, grants to states and union territories' governments, pensions, police, economic services in various sectors, other general services such as tax collection, social services, and grants to foreign governments. Non-plan capital expenditure includes defence, loans to public enterprises, loans to states, union territories and foreign governments. The non-plan expenditure does not generally contribute to creation of assets.

Table A3.1 Forestry under the Five-Year Plans, 1951-2002 (Rs. in million)

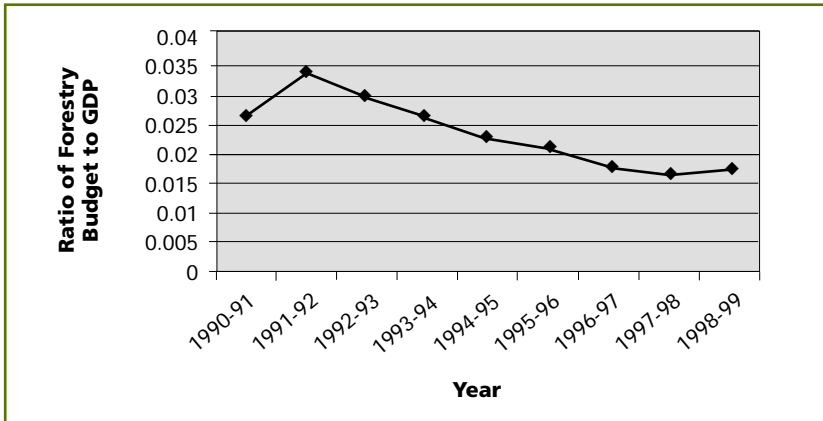
Plan/ Year	Total Plan		Agriculture Plan		Forest and Wildlife Plan		Forest & Wildlife outlay (% of total)
	Outlay	Actuals	Outlay	Actuals	Outlay	Actuals	
First Plan (1951-56)	23,780	19,600	3,540	2,900	76	85	0.32
Second Plan (1956-61)	45,000	46,720	5,100	5,490	212	212	0.47
Third Plan (1961-66)	75,000	8,577	10,860	10,890	458	459	0.61
Annual Plans (1966-69)	66,250	66,225	10,370	11,070	419	421	0.63
Fourth Plan (1969-74)	159,020	157,790	27,280	23,200	894	938	0.56
Fifth Plan (1974-79)	393,220	394,260	47,660	48,650	2,088	2,088	0.53
Annual Plan (1979-80)	126,010	121,760	18,150	19,960	683	683	0.54
Sixth Plan (1980-85)	975,000	1,092,920	125,390	152,010	6,924	NA	0.71
Seventh plan (1985-90)	1,800,000	2,187,300	222,330	315,090	18,591	19,759	1.09
Annual Plan (1990-91)	647,170	583,690	91,420	85,420	6,299	5,764	0.97
Annual Plan (1991-92)	723,170	647,500	100,580	90,600	7,831	7,153	1.08
Eighth Plan (1992-97)	4,341,000	-	636,420	-	40,080	39,930	0.94
Ninth Plan (1997-2002)	-	-	-	-	68,228		
<b>Total up to VIII Five-Year Plan</b>	<b>9,374,620</b>		<b>1,299,100</b>		<b>85,295</b>		<b>0.90</b>

Source: GoI 1999

## Financial outlay in the annual plans

The forestry sector allocation made through the MoEF covers two main components: (1) forestry and wildlife and (2) ecology and environment. It is mainly the expenses under the forestry and wildlife head that are used for the management and development of the country's forest resources. Figure A3.1 shows that the ratio of allocation to 'Forestry and Wildlife' as a proportion of the Gross Domestic Product at constant prices has declined in the past decade (see Figure A3.1).

**Figure A3.1 Ratio of forestry budget to Gross Domestic Product at constant prices (1993-94)**



**Source:** Kadekodi 2001

While it is difficult to calculate the proportion of funds spent on different activities, a rough estimate regarding the funds spent over the past decade is as follows:

- social forestry – 50%;
- protection and conservation – 20%;
- production forestry – 15%;
- environmental forestry (including wildlife) – 10%;
- research, education and training – 5% (GoI 1999).

The share of central government in the total forestry sector outlay has declined sharply in recent years. While it was about 58% in the VII Five-Year Plan, it declined to only 32 in the VIII Five-Year Plan (GoI 1999).

## External assistance

External assistance has become an important source of funding of the forestry sector in the past couple of decades. Between 1981-82 and 1991-92, the percentage share of external assistance in the total plan outlay for the sector was around 30%. Currently, nineteen externally assisted projects with a total outlay of Rs. 42.2783 billion are being implemented in 13 states. Another five projects with a total outlay of Rs. 26.0733 billion are in the pipeline (see Table A3.2 and



**Table A3.2 Externally assisted projects under implementation and recently completed**

<b>Name of project</b>	<b>Funding agency</b>	<b>Project cost (in million Rs)</b>	<b>Date of commencement</b>	<b>Date of completion</b>
Maharashtra Forestry Project	World Bank	4,315.1	1992-93	1999-2000
Andhra Pradesh Forestry Project	World Bank	3,539.2	1994-95	1999-2000
Tamil Nadu Afforestation Project	OECF (Japan)	4,992.0	1996-97	2001-2002
Capacity Building Project for Participatory Management Dungarpur Integrated Wastelands Development Project, Rajasthan	SIDA (Sweden)	85.0	1997-98	1998-1999
Rehabilitation of Common Lands in Aravallis, Haryana	EC (Europe)	282.1	1992-93	1998-1999
Afforestation & Pasture Development along Indira Gandhi Canal, Rajasthan	EC (Europe)	481.5	1990-91	1999-2000
Afforestation of Aravalli Hills, Rajasthan	OECF (Japan)	1,075.0	1990-91	1999-2000
Western Ghats forestry Project, Karnataka	OECF (Japan)	1,766.9	1992-93	1998-1999
Forestry and Ecodevelopment Project in Changer, Himachal Pradesh	DFID (U.K)	842.0	1992-93	1998-1999
Forestry Project Kullu-Mandi, Himachal Pradesh	GTZ (Germany)	187.0	1994-95	1998-1999
Uttar Pradesh Research Project	DFID (U.K)	139.2	1994-95	1999-2000
Madhya Pradesh Forestry Project	World Bank	2,720.0	1997-98	2000-2001
Rajasthan Forestry Project	World Bank	2,459.4	1995-96	1999-2000
Integrated Gujarat Forestry Development Project	OECF (Japan)	1,391.8	1995-96	1999-2000
Eastern Karnataka Afforestation Project	OECF (Japan)	6,085	1995-96	2000-2001
Punjab Afforestation Project	OECF (Japan)	5,655.4	1996-97	2001-2002
Kerala Forestry Project	OECF (Japan)	4,420*	1997-98	2004-2005
Capacity Building Project for Rehabilitation of Degraded Forests through Landscape Participatory Programmes	World Bank	1,830	1998-99	2001-2002
	AUSAID (Australia)	11.7	1998-99	2000-2001
<b>Grand Total</b>		<b>42,278.3</b>		

\*Loan amount has been provided for four years only in the first phase.

Source: Gol 1999

**Table A3.3 Externally assisted projects in the pipeline**

<b>Name of the project</b>	<b>Funding agency</b>	<b>Project cost (Rs. million)</b>	<b>Project period</b>
Eco-Conservation and Re-afforestation of Shifting Cultivation, Nagaland	EC (Europe)	412.5	5 years
Aravalli Forestry Project	OECF (Japan)	5,630.8	4 years
Madhya Pradesh Forestry Project Phase -II	World Bank	13,800	5 years
Arunachal Pradesh Forestry Project	World Bank	3,600	5 years
Institution Building and Integrated Natural Resource Development in the Aravalli Region, Haryana	EC (Europe)	2,630	10 years
Himachal Pradesh Forest Sector Reforms Project	DFID (UK)	811	7 years

**Source:** GoI 1999

Table A3.3). The significance of external assistance can be gauged from the fact that in 1998-99, the combined outlay of externally aided projects in the sector was Rs. 8.3 billion against the total current annual expenditure of Rs. 15 billion, in other words, over 55% (GoI 1999).

### Private sector

It is difficult to estimate the investment made by private sources in the forestry sector as figures for these investments are not as readily available as those in some other sectors. For example, the available figures for the agriculture sector indicate that during the VIII Five-Year Plan, the private sector contributed 65% of the investment while government's share was only 35% (GoI 1999).<sup>6</sup> It is likely that some of the investment made in farm forestry was included under agriculture. Formal private investments taking place in the forest industry sector are probably recorded under the manufacturing sector.

However, based on a number of assumptions, the level of investment by the private sector for the year 1993-94 was estimated to be about Rs. 26.7 billion – Rs. 10.08 billion for forestry and Rs. 16.62 billion for forest industry (GoI 1999).

Considering that 1993-94 was a particularly weak year for private sector investment in forest-based industries due to raw material shortages and considering that the area under farm forestry and JFM has increased significantly in recent years, the current contribution of the private sector is likely to be more than the 1993-94 level.

6. The total investment in the agriculture sector during the VIII Five-Year Plan was Rs. 1488 billion out of which Rs. 968 billion was contributed by the private sector (GoI 1999).

## Annex 4 Demand and supply situation of selected forest products

Many initiatives are being taken in government, as well as in the private sector, to augment supplies of forest products. The general consensus is that there is a huge demand-supply gap and that supplies need to be augmented if the demand is to be met sustainably. Many studies have been undertaken over the years to examine the demand-supply scenario for various forest products. However, most of the available demand estimates dwell on notional demand rather than effective demand, although the latter is a better indicator. Effective demand pertains to the aggregate demand for goods and services, backed up by the resources to acquire them. This should be distinguished from notional demand, which refers to a desire for goods and services, which is not supported by ability to pay, and can thus not be communicated to suppliers through price mechanisms.

In this section, an attempt has been made to collate and synthesise available information regarding the demand and supply of certain important forest products. While the section presents aggregate demand and supply data at the national level, it needs to be acknowledged that such aggregate figures can be misleading. In a vast country like India, it may not always be feasible to meet the demand for certain forest produce in one region through supplies from another region on account of high cost for transporting bulky produce such as fuelwood or industrial wood. Thus, simply increasing the area under forests or improving productivity cannot resolve the problem of fuelwood and industrial wood shortage in the country. Production needs to be increased keeping region-specific needs in mind.

Quite apart from this, it also needs to be borne in mind that the demand estimates for industrial wood are dated and that changes in the last decade would have had quite a significant influence on it. With the issuance of the 1988 National Forest Policy, which states that the supply of subsidised raw material to industry must stop, the prices of raw material have gone up. This has definitely lowered the demand.<sup>7</sup> Further, liberalisation of the economy in the 1990s has paved the way for importing forest raw material as well as finished goods at highly competitive prices. Both have resulted in a decline in the demand for indigenous raw material. Again, this is not reflected in the old demand estimates. Also, the declining supply of raw material from forests as a consequence of degradation and bans on felling imposed by the Supreme Court has forced a number of industries to shut down. This has also depressed demand. All these factors mean that the demand for forest produce that is

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7. The demand figures seem to be calculated irrespective of the price of goods. The demand that existed for subsidised raw material from the forests is likely to be much higher than the demand for produce available at market rates. Higher prices would induce industries to be more efficient in their use of raw material. It would also impel them to look for cheaper alternatives and in some cases force them to close down, as their enterprise may no longer be financially viable. Hence, demand figures calculated prior to the issuance of the National Forest Policy would be quite unrepresentative of the demand in the current situation.

projected by the numerous studies is no longer valid under the current circumstances. There is, therefore, need to exercise caution while using the figures presented in this section.

## Fuelwood

India is the world's leading producer and consumer of fuelwood, which is the single most important product obtained from the forests. It has been estimated by the MoEF that in 1994, between 83% and 88% of the total wood demand in the country was just for fuelwood (GoI 1999).

Over the years, there have been a number of estimates by various experts on the consumption of (or demand for) fuelwood in the country. Since there are no official records of actual removal of fuelwood from forest areas to indicate the consumption, calculations are generally based on per capita consumption levels in different regions of the country. The situation is complicated due to the vast size of the country, variety of end users of the resource, variations in geographical and demographic conditions, easy access to and unrecorded removal of the material from the forests and many other reasons. Table A4.1 presents some of the estimates prepared by various agencies and authors.

**Table A4.1 Estimation of consumption of fuelwood in India**

<b>Year</b>	<b>Fuelwood in million MT</b>	<b>Agencies/ Authors<sup>a</sup></b>	<b>Projected consumption in year 2001 with 2.1% growth<sup>b</sup></b>	<b>Projected consumption year 2001 with 2.6% growth<sup>c</sup></b>
1975	133	Swaminathan	228	259
1982	157	FAO	233	256
1987	157	Forest Survey of India	210	225
1991	173	Ravindranath and Hall	213	224
1991	265	Dwivedi	326	343
1991	306	Planning Commission	377	396
1993	194	FAO	229	238
1996	201	NFAP	223	229
1996	343	Planning Commission	381	390
2000	312	Ganguli	319	320
2001	224	NFAP	224	224
2001	384	Planning Commission	384	384

(Figures available in m<sup>3</sup> have been converted into MT by multiplying by 0.8, for comparison).

a. All references in Majumdar 2000

b. Calculated using a 2.1% annual growth in demand (due to population).

c. Calculated using a 2.1% annual growth in demand (due to population) and a 0.5% increase in use of fuelwood per year due to declining availability of alternatives.

Comparison of these demand/ consumption figures is difficult, as they have been done for different years. For ease of comparison, however, the demand in all cases has been projected to the year 2001 by assuming that the demand has grown in line with the rate of population growth, 2.1% per annum. The reduced availability of alternative fuels (such as animal dung and agricultural residues) also affects the demand for fuelwood. It is estimated in the National Forestry Action Programme (NFAP) document that consumption of fuelwood rose by 0.5% each year on this count. Hence, projections have also been adjusted keeping this factor in mind. The demand projections made by Swaminathan, FAO, Forest Survey of India, Ravindranath and Hall and the NFAP are more or less similar and range between 210-233 million MT, where an increase of 2.1% per annum is assumed and between 224-259 million MT, where an increase of 2.6% is assumed. The estimates prepared by Dwivedi, Ganguli and the Planning Commission are different and on the higher side. These range between 320 and 396 million MT for the year 2001 assuming a 2.6% increase in demand per annum.

As mentioned earlier, it is difficult to say which of the calculations are more accurate. Even if we take the more conservative of the estimates, by the year 2001, the total demand for fuelwood would be a staggering 224-259 million MT (or 280-324 million m<sup>3</sup>). In contrast to this, according to the NFAP, the total fuelwood that could be *sustainably* harvested from India's forests, both government and private, in 1996 was a meagre 79 million MT.<sup>8</sup> This means that around 121 million tonnes of fuelwood was unsustainably removed. As can be seen from Table A4.2, it is the household sector that places the highest demand on fuelwood. It consumes over 80% of the total fuelwood used in the country. And as can be seen from Table A4.3, degraded lands, roadsides and farm lands contributed more fuelwood than the forest lands in 1991.

**Table A4.2 Fuelwood consumption in India in 1996**

<b>Item</b>	<b>Consumption of fuelwood (million tonnes)</b>	<b>Percentage of total</b>
Household i. Forested rural	78.00	
ii. Non forested rural	74.00	
iii. Urban area	10.00	
Sub total	162.00	80.6
Cottage industries	25.00	12.4
Rituals	4.00	2.0
Hotels	10.00	5.0
<b>Total</b>	<b>201.00</b>	<b>100.0</b>

**Source:** Gol 1999

8. The annual allowable cut of fuelwood from government forests is about 44 million tonnes and from private forests it is about 35 million tonnes.

**Table A4.3 Sources of supply of fuelwood in India (1991)**

<b>Source</b>	<b>Details</b>	<b>Total fuelwood contribution in million tonnes/ year</b>
Forest	Felling of trees	19.0
	Lopping of twigs and branches	42.0
	Logging wastes	9.5
Shrubs on degraded lands and roadsides		46.0
Tree planting on 17 million hectares during 1975-90 through social and farm forestry programmes	Tops, twigs, small branches and poles	40.0
Homestead gardens	Twigs and branches	16.0
<b>Total</b>		<b>172.5</b>

Source: GoI 1999

## Industrial wood

Industrial wood includes all types of wood other than fuelwood. As with fuelwood, numerous studies have also been carried out to estimate the demand and supply of industrial wood in the country.

The Forest Survey of India estimated the demand for industrial wood in 1987 to be around 27 million m<sup>3</sup>, of which 19.61 million m<sup>3</sup> is the demand from the industrial sector and 7.93 million m<sup>3</sup> from the household sector (such as agricultural implements and housing materials). The details of this demand are presented in Table A4.4.

The demand by the household sector presented in the above table seems surprisingly low. The NFAP re-estimated the total demand for industrial wood by using another set of Forest Survey of India data on wood consumption by the household sector. Assuming a 2.1% increase in household demand for timber and a 5% increase in requirement of industry, the NFAP has projected the total demand for industrial wood as 64.4 million m<sup>3</sup> for 1996 (comprising 54.4 million m<sup>3</sup> household sector demand and 10 million m<sup>3</sup> residual industrial sector demand<sup>9</sup>), 73 million m<sup>3</sup> for 2001 and 81.8 million m<sup>3</sup> for 2006 (see Table A4.5).

9. The total wood demand by the industrial sector has been estimated and projected by the Forest Survey of India as 29, 34 and 39 million m<sup>3</sup> for 1996, 2001, 2006 respectively. This estimate also includes all urban housing, all urban furniture and at least 30% of rural housing. Therefore, the balance of industrial need can be calculated as:

Balance of industrial need=estimate of requirement by industry-(requirement of urban housing+requirement of urban furniture+30% of requirement of rural housing). Accordingly, the balance of industrial need for 1996 would be 29-(7+3.7+8.4)= 10 million m<sup>3</sup>.

<b>Timber products</b>	<b>Requirement of timber (million m<sup>3</sup>)</b>
Pulp and paper	6.57
Plywood and veneer	1.71
Fibre board, particle and chip board	0.23
Match industry	0.4
Sports goods industry	0.03
Railway sleepers	0.50
Packaging	6.81
Others (including mine pit props, truck and bus bodies etc.)	3.00
Furniture and panelling	0.36
Sub-total (demand from industrial sector)	19.61
Agricultural implements, bullock carts and temporary rural constructions	5.43
Housing	2.50
Sub-total (demand from household sector)	7.93
<b>Total</b>	<b>27.54</b>

Source: Gol 1999

<b>Sector</b>	<b>1996</b>	<b>2001</b>	<b>2006</b>
Household sector demand	54.4	60.4	66.6
(a) Housing and allied domestic uses	35	39	43
(i) rural	28	31	34
(ii) urban	7	8	9
(b) Furniture	9.4	10.4	11.6
(i) rural	5.7	6.3	7.0
(ii) urban	3.7	4.1	4.6
(c) Agricultural implements	10	11	12
Residual industrial sector demand	10	12.6	15.2
<b>Total</b>	<b>64.4</b>	<b>73.0</b>	<b>81.8</b>

Another study, carried out for the NFAP estimates the total demand for industrial wood as 53.67 million m<sup>3</sup> for 1994 (see Table A4.6). Assuming a 5% increase in demand per annum, this amounts to 59 million m<sup>3</sup> for 1996. Though this is comparable to the demand figure of 64.4 million m<sup>3</sup> calculated by NFAP, the major difference lies in the wood demand for pulp and paper. While NFAP calculations for the residual industrial sector are only 10 million m<sup>3</sup> for 1996 (which includes pulp and paper as well as demand by other industries like match, packaging and some plywood and board units), the study undertaken for NFAP presents a demand of 11.88 million m<sup>3</sup> for pulp and paper alone for 1994. Clearly, there is some disparity between the two studies.

A report by Chem Projects prepared for the MoEF estimates the total wood requirement as 51.9 million m<sup>3</sup> for 1998, 57.7 million m<sup>3</sup> for 2000 and 73.9 million m<sup>3</sup> for 2005 (Ganguli *et al* 1999, in Majumdar 2000).

**Table A4.6 Product-wise demand for industrial wood (1994)**

Type of product	Demand (million m <sup>3</sup> )
Sawnwood	25.72
Roundwood	12.33
Pulp and paper	11.88
Panel products	3.74
<b>Total</b>	<b>53.67</b>

Source: Gol 1999

Thus, the various estimates of industrial wood demand range between 50 to 65 million m<sup>3</sup> for the year 1996. As with fuelwood, there is no clear way to validate one estimate or the other.

The demand for industrial wood is met through supplies from government forests and non-forest sources such as farmlands and homestead gardens. According to the Forest Survey of India, the sustainable annual cut of industrial wood from the forests is only about 12 million m<sup>3</sup>. Another 14-15 million m<sup>3</sup> can be sustainably harvested from private plantations. Thus a total of only 26-27 million m<sup>3</sup> of industrial wood is available in the country. Even assuming a demand of only 50 million m<sup>3</sup> there is a shortfall of 23-24 million m<sup>3</sup>. In case the demand is around 65 million m<sup>3</sup>, the shortfall is 37-38 million m<sup>3</sup>. This shortfall is largely being met from unrecorded removal from forests and plantations and some of it through imports. The import of forest products has increased sharply in recent years. For example, the total import of industrial roundwood in 1996 was 0.89 million m<sup>3</sup> or 7.2% of the country's roundwood demand. This had increased by nearly two and a half times to 2.1 million m<sup>3</sup> in 1999. This is a considerable drain on the country's foreign exchange reserves. In 1999, the total import bill for forest products was Rs. 37.1 billion<sup>10</sup>, of which industrial roundwood was Rs. 9.3 billion (FAO 2001).

10. The net import bill was Rs. 34.5 billion.



## Pulpwood

Pulpwood is an important raw material used by the pulp and paper, paperboards, newsprint, rayon and allied industries.

Based on a number of assumptions, Ganguli (Ganguli 2000) has made the following projection regarding the current and future demand of pulpwood in the country:

<b>Years</b>	<b>Paper and paper boards</b>	<b>Newsprint</b>	<b>Rayon grade pulp</b>	<b>Total</b>
1998	4.48	1.46	2.1	8.04
1999	4.48	1.63	2.3	8.41
2000	4.48	1.78	2.5	8.76
2005	8.96	2.56	2.8	14.32
2010	15.40	3.42	3.1	21.92
2015	24.64	4.63	3.4	32.67
2020	35.84	6.22	3.8	45.86

**Source:** Ganguli 2000

The Centre for Science and Environment (CSE) has calculated that between 1995-96 and 1997-98, on average, the country's pulp and paper industry obtained 41.7% of fibrous raw material from government owned natural forests, 25.2% from farm forestry, 20.6% from the open market and 12.5% from captive plantations (CSE 1999).

Using pulpwood figures for the years 1982 to 1993 compiled by ICFRE and the break-up of supply sources provided by the CSE, the supply of pulpwood and the gap between demand and supply has been projected as follows:

<b>Year</b>	<b>Demand</b>	<b>Supply from government sources</b>	<b>Supply from other sources</b>	<b>Total supply</b>	<b>Gap</b>
1998	8.04	1.7	1.6	3.3	4.74
1999	8.41	1.8	1.7	3.5	4.91
2000	8.76	2.0	1.9	3.9	4.86
2005	14.32	2.8	2.6	5.4	8.92
2010	21.92	3.9	3.6	7.5	14.42
2015	32.67	5.5	5.1	10.6	22.07
2020	45.86	7.7	7.1	14.8	31.06

Some of the gap in the demand and supply of pulpwood is being met through import of pulp. Figures available from FAO indicate that in 1999 about 13.8% of pulp was imported. While importing pulp is an option for bridging the demand-supply gap, many industrialists do not consider it a viable long-term option on account of the volatility of international pulp markets (see Table A4.9).

**Table A4.9 Import price of wood pulp (\$/ MT)**

<b>Year</b>	<b>Rate</b>
1990	569
1991	510
1992	560
1993	344
1994	423
1995	732
1996	430
1997	406
1998	375
1999	445

Source: FAO 2001

## Bamboo

Bamboo is an important forest product that has a large number of uses. It is used for pulp making, construction purposes, furniture making, fencing, basket and mat making, handicrafts, preparation of panels, fuel and for several other industrial and domestic uses. Several species of bamboo are also edible.

Bamboo occurs naturally as an under storey in many tropical, subtropical and even temperate forests in India. The extent of bamboo forests in the country is estimated to be 10.03 million hectare (Tewari 1991). Using ICFRE figures as a base, the total bamboo production in the country in 1995-96 has been estimated to be around 3.8 million tonnes. The consumption pattern of bamboo (see Table A4.10) shows that around 35% of the total bamboo removed is used for making pulp while housing and rural uses account for 20% each.

The growing stock of pure bamboo stands in India in 1980 and 1985 as per FAO/ UNEP projections (UNEP 1981, in Majumdar 2000) is respectively 12.0 and 11.7 million air dried tonnes (see Table A4.11).

With reference to the growing stock, the potential availability of bamboo in India (depending on the annual allowable removal from the stands) is approximately 4.6 million tonnes. The removals by the FD thus appear to be

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

**Source:** Tewari, D.N., in Majumdar 2000

	<b>1980</b>	<b>1985</b>
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

**Source:** FAO/ UNEP 1981, in Majumdar 2000

much lower than that which can be sustainably removed. However, these figures need to be used carefully because actual production varies considerably from year to year.<sup>11</sup>

Presently, the potential supply of bamboo seems to be higher than the demand. However, the projections for the future show that this is unlikely to continue.

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11. This is due to gregarious flowering in bamboo after which the entire bamboo stand dies and the stock of flowered bamboo is harvested as soon as possible. In years of gregarious flowering, the actual production of bamboo will greatly exceed the sustainable harvest in normal years. However, in the subsequent years, i.e. during the period of establishment of regeneration, the actual production will be almost nil in these forests. This phenomenon takes place after a prolonged gap, which varies with species and also with site quality, management practices, biotic interference etc. This period is around 40 years for *Dendrocalamus strictus*.

It is estimated that in the years 2000 and 2010, 2.38 and 4.02 million tonnes of bamboo respectively will be used to produce 4.5 million tonnes of paper and paperboard in 2000 and 7.6 million tonnes in 2010<sup>12</sup> (projection by Green Rating Project, CSE).

However, pulp occupies only 35% of bamboo use and the remaining 65% is used for other purposes. Continuing these projections, the estimated consumption of bamboo for 2000 and 2010 will be around 6.8 and 11.4 million tonnes respectively.

Considering that India's forests have a potential for bamboo production of about 4.5 million tonnes, the gap between demand and supply is enormous even if the total potential of the bamboo forests is tapped. The projected gap for the year 2001 and 2010 is 2.3 million tonnes and 6.9 million tonnes respectively.

If we consider that one-fourth of this gap will be supplemented by the yield of bamboo from newly created bamboo plantations in the last 10 years, the size of the unfilled gap can be estimated as 1.73 and 5.2 million tonnes in 2000 and 2010 respectively.

The above-mentioned gap between demand and supply of bamboo stems from the analysis of consumption of bamboo essentially in the manufacture of paper pulp. However, the other major consumption of bamboo is in housing, other non-housing rural uses, and use as fuel. Considering the absence of any substitute for bamboo on the horizon in the rural sector for constructing houses, and the projected acute shortage of fuelwood in the rural sector in the country, these consumption loads are expected to increase with the increase in population. This will naturally increase the gap between the requirement of bamboo and its production and supply.

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12. Consumption of bamboo was 0.63 million tonnes in 1.19 million tonnes of total production of paper and paperboard in 1979 i.e. 53% (FAO/UNEP 1981, in Majumdar 2000). This same percentage is used to calculate the consumption of bamboo in the production of paper and paperboard in the future.

## Annex 5 Laws governing private forests

**Table A5.1 Laws restricting transfer of private forest lands**

<b>Law</b>	<b>Section</b>
Andhra Pradesh Forest Act, 1967	28B
Kerala Preservation of Private Forest Act, 1972	3
Tamil Nadu Preservation of Private Forest Act, 1949	3
Orissa Preservation of Private Forest Act, 1947	3

**Table A5.2 Laws regulating the use of private forests**

<b>Law</b>	<b>Section</b>
Andhra Pradesh Forest Act, 1967	28B
Bihar Private Forests Act, 1947	7
Goa, Daman and Diu Forest rules, 1964	46
Himachal Pradesh Private Forest Act, 1954	7
Karnataka Forest Act, 1963	37
Kerala Preservation of Private Forests Act, 1972	3
Orissa Preservation of Private Forest Act, 1947	3
Tamil Nadu Preservation of Forests Act, 1949	3
Tamil Nadu Hill Areas (Preservation of Trees) Act, 1955	3,4
Uttar Pradesh Private Forests Act, 1948	7
West Bengal Private Forests Act, 1948	5-A

## Annex 6 Factors governing the decision to invest in private plantations

### User rights

Many states have regulations that govern the use of trees growing on private lands (refer Table A6.1). Permission, often from the Divisional Forest Officer or a designated tree authority, is required to fell trees and to transport forest produce. The relevant species are listed in schedules that may be modified through notification. Normally, scheduled species are those of commercial timber value and permits are issued to prevent their illegal removal from government forests. However, the procedure of seeking permission for felling is cumbersome and complicated and in practice these become sources of harassment and rent seeking by the concerned officials.<sup>13</sup> The existing regulations act against the interest of the producers and bring in an element of uncertainty in the operation of sale transactions (Saxena and Ballabh 1995) and this discourages tree farming. In non-tribal areas, the only rationale for such a system is to establish the legitimate source of produce. In order to ensure that this is not a disincentive for plantation, it is possible to prune the list of scheduled species to exclude those that are preferred by farmers. In most cases, there is little overlap between these species and those found naturally in government forests. Such a step was in fact taken in Uttar Pradesh in 1982. A total of 16 species, including poplar, eucalyptus, casuarina and *subabul* were notified to be exempt from the provisions of the tree protection law.<sup>14</sup> In the later years, several states lifted some of the restrictions on popular farm forestry species. Gujarat removed restrictions on eucalyptus and casuarina in 1984. Rajasthan, Tamil Nadu and Andhra Pradesh also relaxed regulations for the commercial species (Pathak 1994). Still, the regulations in question are one of the main irritants for the farmers involved in tree planting.

The above arguments also hold for transit passes. In certain states, transit rules have been modified to facilitate private growers. For instance, in Andhra Pradesh eucalyptus, casuarina and *subabul*, all popular with farmers, were exempted from transit passes in 1984. In Orissa, the Range Officer (as opposed to the Divisional Forest Officer or Assistant Conservator of Forests) was authorised in 1991 to issue permits in respect of certain plantations (barring 11 species) under the state social forestry project. As late as 1992, eucalyptus and certain bamboo species were exempted from transit rules in the state. Interestingly, in 1988 a clause was added in the Madhya Pradesh Transit (Forest Produce) Rules, 1961, that allow the village *panchayat* to issue transit passes for certain species. Madhya Pradesh cut down its list of trees requiring transit permit to 15 species found in natural forests.

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13. In Uttar Pradesh, for instance, the police have the power to apprehend a person for felling certain common species of trees standing on his or her land without permission (Pathak 1994).

14. The complete list is as follows: *Sesbania grandiflora*, *Ailanthus excelsa*, *Alnus nitida*, *Casuarina equestifolia*, *Pithecellobium dulce*, *Populus spp.*, *Tamarix aphylla*, *Melia azadirach*, *Acacia nilotica*, *Prosopis juliflora*, *Eucalyptus spp.*, *Robinia pseudoacacia*, *Acacia mearnsii*, *Salix spp.*, *Albizia spp.*, *Leucaena leucocephala* (vide notification no. 86/XIV-3-377-76, dated January 20, 1982).

**Table A6.1 Laws that control felling of private trees**

Law	Section	Number of species
Andhra Pradesh Preservation of Private Forest Rules, 1978 (applicable only in scheduled areas)	3	12 (10 species prohibited)
Karnataka Preservation of Trees Act, 1976	8	All but 2
Kerala Preservation of Trees Act, 1986	4	10
Maharashtra Felling of Trees (Regulation) Act, 1964	3	14 +12 mangrove species
Uttar Pradesh Protection of Trees in Rural and Hill Areas Act, 1976	4,5	42 timber species and 13 fruit species

## Land availability

Scarcity of land is often cited as a major reason hampering the growth of private plantations. Some argue that land ceiling restrictions should be removed in order to promote land uses such as forestry for which larger land units may be better suited.

However, it needs to be kept in mind that land ceilings are instruments to promote equity and were introduced to address the problem of acute imbalance in the land holding pattern in the country. Even today, large farms that account for only 1.6% of holdings constitute 17.3% of the operated area (MoA 2000). There are few takers for policy reform that would favour the relatively better off minority in the society. It is also important to note that the average operational holding in all states is far below ceiling limits. Given the predominance of small and marginal farmers, the general scarcity of land is a far more serious constraint to private sector forestry, compared to the land ceiling limits *per se*.

Thus, the need to promote private plantation does not present a strong case for changing land ceilings. However, there are sufficient grounds to treat forestry on par with plantation crops. The national guidelines stipulate that plantations of tea, coffee, rubber, cardamom, cocoa, coconut, arecanut, banana and vineyards should be exempt from land ceiling limits. There is no logical reason to exclude forestry species from this list. The national guidelines also recommend that land held by industrial or commercial undertakings for non-agricultural purposes should be exempt from ceiling laws. Certain exemptions are also given to registered cooperative farming societies.

Under the land ceiling laws, even a company can own and manage only as much agricultural land as permitted under law for any individual. Permissible

agricultural holdings are very small which restrict the corporate sector from playing any meaningful role in private sector forestry development or for raising any captive industrial plantations for meeting raw material requirements for the wood-based industries. Some of the state governments like Madhya Pradesh and Maharashtra have issued notifications in the recent past for relaxing ceiling limits for agricultural land holdings for certain specified purposes within reasonable limits. However, this reform has been half hearted and extremely limited in scope. As the rules and procedures prescribed are cumbersome, there has been little scope for the forest-based industries to develop any captive industrial plantations.

### **Technical support**

Forestry research by the state FDs and various forest research institutes under the ICFRE is mostly funded by the government. Research in agro-forestry is also carried out by the universities and Indian Council for Agricultural Research (ICAR). Legislation for *sui generis* protection of breeder's rights is still pending, and there is no mechanism for certification of seed of forestry species or registration of clones. There is, therefore, very little incentive for private sector investment in forestry research. Despite this, companies are undertaking research and development work in order to encourage plantation activity that would generate raw material for them. However, it is the case that research and development work by the private sector can be greatly promoted if a more facilitative policy environment were to be put in place.

### **Institutional finance**

Credit disbursement for undertaking plantation activities in the country is extremely limited. Published statistics of scheduled commercial banks on sectoral loans have heads for agriculture, industry, transport operators, professional and other services, personal loans, trade and finance; forestry is conspicuously absent from this list (RBI 1999). However, recognising the need to promote lending to the forestry sector, NABARD offers refinance through a number of bankable schemes.

Over the past ten years or so, NABARD has liberalised its lending policies to channelise credit through joint sector undertakings, private companies, cooperatives and private entrepreneurs for nurseries, farm forestry and industrial plantation. Despite this, its cumulative disbursement to the forestry sector as of 31 March 1999 was a modest 0.6% of total disbursement.<sup>15</sup>

### **Trade policy and markets**

Till the mid 1980s, the domestic market for most goods was closely protected by import restrictions and administered prices. Liberalisation of trade intensified rapidly with the introduction of economic reforms in 1991 and India's ratification of the WTO agreement in 1994. Trade policy reforms have

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15. It was only in December 1999 that NABARD sanctioned the first JFM project (see Section 5).



progressively simplified India's restrictive import licensing and reduced tariff protection. So far, the emphasis has been on capital goods and inputs for industry to encourage domestic and export oriented growth; by and large imports of consumer goods and agricultural commodities still remain regulated.

Regulation of exports includes prohibition on exporting items such as wildlife forms, exotic birds and wood. Licences are required for 90 items, mainly agricultural commodities, for socio-cultural or environmental reasons. Only 23 items (including *gum karaya*) are reserved for monopoly trading by state agencies (WTO 1998).

Parallel to reducing import controls, customs duties have also been reduced. Between 1993-94 and 1997-98, the simple average of all import duty rates came down from 71% to 35% (with a weighted average of 20%) and the process of reform and reduction continues. Collection rates, which are a better indicator of protection than declared rates, came down from the level of 47% in 1990-91 to 29% in 1995-96 (WTO 1998).

As a result of the Uruguay Round, India set an upper limit of (or bound) 67% for its tariffs in the manufacturing sector and 100% in the agriculture (including forestry) sector. Lines remaining unbound include those of certain industrial items and many consumer products. The bindings range from 0-300% for agricultural products and from 0-40% for non-agricultural products. Manufactured products were bound at 25% on intermediate goods and 40% on finished goods. The bound simple average tariff to be implemented by the year 2005 is 54%, compared with the present applied rate of 35%, which is expected to decline further. Many applied tariffs are well within the bound rates. Thus India, like most other developing countries, has put a ceiling on its protective structure rather than binding import duties at effective levels, while continuing to pursue unilateral liberalisation (WTO 1998).

Drastic changes in the trade policy have a deep influence on domestic markets, including those of timber and NTFPs. Boxes A6.1 and A6.2 list forest produce on the negative list of imports and exports respectively. As can be seen from these lists, the import of wood, wood products and pulp is now virtually unregulated. However, a number of NTFPs are still under state trading regimes, and many others require import licences. The export of wood and unfinished wood products is prohibited on grounds of national scarcity, as are 29 species of wild plants. *Gum karaya* may only be exported by TRIFED and licensing applies to forestry seeds. Both lists highlight the contrast between liberalisation of wood versus that of non-wood products.

This contrast is even more obvious in the present structure of import duties. While wood-based raw material and intermediate products respectively attract the lowest and middle order of import duties, those on non-wood raw material and finished goods are pegged at the highest level possible.

## Box A6.1 Forest produce on the negative list of imports

### 1 Prohibited items

None

### 2 Canalised items (for exclusive state trading)

None

### 3 Canalised items (with provision for special import licenses)

- *Cassia*, cinnamon bark, cinnamon tree flowers, *tejpatta*, cloves: to be imported through Spices Trading Corporation Limited, or NAFED; Special import licence available at 5 times the value of imported goods
- *Mahua* oil (not edible grade), oil cake and oil cake meal expeller variety; residues *babool* seed extraction; oil cake of *neem* seed extraction: to be imported through State Trading Corporation, or Hindustan Vegetable Oils Corporation

### 4 Restricted items (subject to licences)

- Nutmeg, mace, tamarind seed and paste
- *Neem* seed, leaves, powder and extracts
- *Bidi* wrappers (*tendu*) and *bidi*, *mohua* flowers, soap nut and soap nut powder, *katha*
- Eucalyptus oil in bulk form (under special import licence)
- Silk worm cocoons, raw silk and silk yarn
- Matting, basketwork and wickerwork

### Wood-based products

- Newsprint
- Composite paper and paper board
- Wall paper, oiled paper and numerous consumer items made of paper
- Sandalwood chips
- Toys of wood (under special import licence)
- Brooms and brushes
- Safety matches
- Woodwork (including carving) of rosewood, sandalwood, *shisham*, walnut wood; lacquer work and inlay work
- Wooden frames, marquetry, inlaid wood, statuettes (under SIL)

**Source:** MoC 1998

Note: Subsequent to August 1998, certain items have been removed from the above list through relevant notifications.

## Box A6.2 Forest produce on the negative list of exports

### 1 Prohibited items

- Plants and parts of plants of wild varieties of 29 specified species, including 18 species notified under appendix I and II of CITES; except with a legal procurement license issued by the Chief Conservator of Forests or Divisional Forest Officer of the relevant area, and with a prescribed CITES permit for export (in respect of the 18 listed species). In the case of cultivated varieties of the above species, it is necessary to obtain a certificate of cultivation from the same authorities. Exports are only permitted through select ports.
- Wood and wood products in the form of logs, timber, stumps, roots, bark, chips, powder, flakes, dust, pulp and charcoal (except sawn timber made exclusively from imported logs or timber, subject to specified conditions)
- Sandalwood in any form (except finished handicrafts, machine crafted products and oil)
- Red sanders wood in any form (excluding certain value added products)

### 2 Canalised items

- *Gum karaya*: may be exported only by TRIFED

### 3 Restricted items

- Seeds of Red Sanders, sandalwood, *neem*, and all forestry species
- Silk worms, silk worm seeds and silk worm cocoons
- Waste paper

Source: MoC 1998

In the case of wood, low import duties and the ban on exports together work to depress domestic prices. This benefits the domestic wood-based industry, which also has the advantage of relatively high import duties on finished goods. On the one hand this adversely affects the profitability of domestic wood producers; on the other hand, wood-based industries have little incentive to improve wood conversion ratios and overall efficiency and competitiveness. It may be more judicious to have moderate to high import duties on raw material, and to increase sales tax and excise duty on final products. Contrary to perceptions that the scope to increase duties is severely limited by obligations to the WTO, Table A6.3 shows that the bound rates of select products are far higher than those applied.

The situation is entirely different in the case of NTFPs. Regulation of imports accompanied by high duty structure insulates the domestic market. Ostensibly, this is designed to protect tribal and other rural communities for whom NTFPs are an important source of income. It is not, however, obvious that this protection enhances or even safeguards rural livelihoods. It certainly does not encourage the efficient production of marketable commodities. Since state owned bodies hold a monopoly in procurement and trade of commercial NTFPs, they are the primary beneficiaries of protectionist trade policies. While this allows the government to fully control prices to its own advantage (which may or may not benefit collectors), it has the dual effect of discouraging efficient production in the private sector and restraining growth of the NTFPs based industry.

**Table A6.3 Tariff bindings on forest produce**

Item	% share of imports (1995-96)	Bound rates (%)	
		Simple average	Range
Wood and articles of wood, charcoal	0.7	36.5	25-40
Pulp of wood/ other fibrous cellulosic material/ waste etc.	0.8	28.2	25-40
Paper and paper board	1.4	39.8	25-40
Lac, gums, resins and other vegetable saps and extracts	0.1	100	100
Vegetable plaiting material	..	100	100
Tannins/ dyeing extracts and derivatives, pigments, etc.	0.4	39	25-40
Silk	0.3	100	100

**Source:** WTO 1998

By virtue of owning the vast majority of forest resources, the government is also the single largest supplier of forest produce. Its control over forest produce is consolidated by laws in several states that establish their monopoly in trade of certain timber and non-timber products. The degree of regulation varies across states. The most extreme is that of Himachal Pradesh, where the government is the sole authority to purchase all forest produce. Trade in sandalwood and *tendu* leaves is nationalised in all states where these species grow. A system of licences is in place for the extraction of *katha* in a number of states. Uttar Pradesh has a separate law dealing with control over resin extraction and trade. States often hold a monopoly in major timber species (normally excluding farm forestry ones)<sup>16</sup> and virtually all important non-timber products.

Consequently, private growers have limited opportunities for marketing a range of forest produce that they may obtain from their lands. Although this does not normally apply to timber species grown on short rotation, it does hold for other timber and NTFPs. A private grower is obliged to supply NTFPs only to approved agencies. These agencies could range from individual agents, to village *panchayats*, primary cooperatives, the FD and state level corporations. In the choice of agents, Madhya Pradesh gives primacy to primary cooperatives and *panchayats*, while in scheduled areas of Maharashtra, village *panchayats* have been assigned ownership rights of NTFPs. These are progressive measures that reduce the difficulty faced by collectors and growers in dealing with larger and more distant agents. Even so, the fact remains that a private grower is paid a collection charge rather than a competitive price for his produce. Also,

16. In Bihar, eucalyptus grown on private holdings was exempted from state marketing as late as 1990 (vide notification S.O 628 dated September 10, 1990).

notwithstanding state monopolies, parallel markets exist for many products. These thrive on unrecorded, illegal removal from government forests and are often characterised by unfair practices (Saxena 1996).

It seems clear that a system of administered prices and procurement by state agencies or agents appointed by the government does not work to the advantage of private growers as it is not driven by primarily by economic principles. It is important to note that state monopoly was introduced to check illicit removal of timber from government forests, and to give a fair deal to collectors (predominantly tribals) of NTFPs from government forests. The consequent constraints imposed on private growers are thus inadvertent rather than deliberate. Nevertheless, state monopolies in trade in forest produce need to be reviewed in the current context of industrial liberalisation in the country.

The government also influences markets of a number of non-nationalised items by virtue of being their single largest supplier. In such cases, growers of such produce must compete with the government in the market. Despite the national directive to end concessional pricing of forest produce to industries, the practice continues in many forms.<sup>17</sup> This lowers the market price and reduces the profits that may be earned by private sector growers.

While most NTFPs are sold by the government through public auction or tender, some amounts are directly supplied to industries owned by government. Under this sort of arrangement, the Gujarat State FDC sells medicinal extracts from plants; the Himachal Pradesh Forest Corporation operates resin factories at Nahar and Bilaspur; the SSFIC in Karnataka produces and sells *katha*; and the Orissa FDC produces and sells honey, arrowroot, *sal* resin, and myrobalans (Forestry Consultants 1994). In the current industrial scenario, such protection to public sector enterprises is not justified.

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17. Subsidised supply is reportedly made to the match industry and paper mills in Assam, and to various industries in Madhya Pradesh, Maharashtra, Orissa and West Bengal. (Forestry Consultants 1994). Uttar Pradesh also continues to supply raw material to industries at less than market rates.

## Annex 7 Comparison of import duties on selected wood-based products: 1990-91 vs. 2000-2001

<b>Item</b>	<b>Basic duty 1990-91</b>	<b>Basic duty 2000-01</b>
Recovered paper and paper board	15%	*60%
Newsprint	15%	100%
Wood sawn or chipped lengthwise (>6 mm thick)	60%	25%
Wood wool and wood flour	60%	25%
Hoop wood, split poles, piles, pickets, stakes and sticks	60%	25%
Hand tools and toys	60%	25%
Fibre board of wood or other ligneous material	100%	35%
Particle board and similar board of wood or other ligneous material	60%	35%
Veneer sheets, sheets for plywood, other wood sawn lengthwise (<6mm thick)	60%	35%
Plywood, veneered panels and similar laminated wood	60%	35%
Densified wood frames, packing cases, tools, table and kitchen ware, marquetry, inlay work, statuettes	60%	35%
Wooden furniture	100%	35%
Miscellaneous paper products plus Rs. 1000/ tonne	100%	35%

## Annex 8 Year-wise prices paid by Wimco for poplar wood to Forest Corporation and farmers (in Rs./ m<sup>3</sup>)

Year	Private	Forest Corporation
1987-88	800	950
1988-89	950	1044
1989-90	1000	1199
1990-91	1125	1510
1991-92	1150	1510
1992-93	1200	1510
1993-94	1445	1685
1994-95	2000	1665
1995-96	2800	2306
1996-97	3900	2767
1997-98	4000	3459
1998-99	5000	4151
1999-2000	6000	4982
2000-2001	6900	5730

**Source:** Wimco Purchase Department

Annex 9 Output of *Bhabbar* from JFM areas in Yamuna Nagar District (1992-96)<sup>18</sup>

Forest	Area (ha)	1992-93		1993-94		1994-95		1995-96		Remarks
		Rs	Quintal	Rs	Quintal	Rs	Quintal	Rs	Quintal	
Darpur	810	31,459	976	36,495	1,053	54,093	1,307	40,685	1,475	Given to the society only in 1995-96; on lease to paper mill before that
Thaska	342.4	18,019	541	24,185	675	41,551	1,004	28,000	1,340	
Salehpur	362.2	36,296	1,089	53,852	1,503	84,547	1,838	58,250	6,220	
Ram Pur Gainda	84.98	13,200	NA	14,190	NA	15,255	NA	16,400	125	Society control since 1992-93
Kathgarh	213	11,500	NA	12,365	NA	13,295	NA	14,300	355	Given to society in 1995-96
Pamuwala	55.4	3,492	105	3,289	102	6,417	155	4,400	110	
Khilawala	693	NA	NA	NA	NA	NA	NA	NA	6,300	
Bagpath (C1-4)	353	NA	NA	NA	NA	NA	NA	NA	3,885	Open auction
Bagpath	106	NA	NA	NA	NA	NA	130	NA	305	1992-94 – society; 1994-95 – lease to paper mill; 95-96 – open auction
Khijri	256	NA	NA	NA	NA	NA	NA	NA	1,500	Open auction
Barah, Faizpur	299	NA	845	NA	862	NA	925	NA	925	Open auction only in 1995-96; on lease to paper mill before that
Kansli	322	NA	819	NA	1,240	NA	1,350	NA	1,374	
Nagli	949	NA	1,600	NA	1,758	NA	2,110	NA	2,780	
Ibrahimpur	198	NA	10	NA	12	NA	15	NA	20	
Nagalpati	557.7	NA	NA	NA	NA	NA	NA	NA	2,663	Open auction

18. The table indicates an increase in production of *bhabbar* but it usually occurs only in the early years of protection after which it starts declining due to closing tree canopy cover.



## Annex 10 Output of major forest produce in JFM areas of south West Bengal

	1996-97	1997-98	1998-99
Area harvested (hectares)	4,673	3,145	3,900
<i>sal</i>	2,819	1,159	2,066
plantation	1,854	1,986	1,834
No. of FPCs harvesting	308	247	332
No. of poles <sup>19</sup> harvested	849,528	690,836	987,748
<i>sal</i>	NA	181,954	475,987
plantation	NA	508,882	511,761
No. of posts <sup>20</sup> harvested	1,815,608	314,037	353,491
<i>sal</i>	NA	35,321	47,219
plantation	NA	278,716	306,272
Cogging sleepers <sup>21</sup> harvested	2,733,097	1,221,120	1,169,827
Fuelwood (m <sup>3</sup> )	100,303	71,308	99,387
Pulpwood (m <sup>3</sup> )	3,311	8,431	6,024
Pulpwood (MT)	1,733	3,096	1,517
Timber (m <sup>3</sup> )	2,023	3,637	5,876
<i>sal</i>	260	74	252
plantation	1,763	3,563	5,624

**Source:** Records of the West Bengal FD

19. Poles generally have a diameter above 6 inches and a length of 10/ 12/ 15 feet. One of the uses of poles in West Bengal is as mining props.

20. Posts have smaller dimensions than poles with a length of between 5 to 6 feet.

21. Cogging sleepers are used on railway tracks (now mainly in mine areas) and are prepared in 3 dimensions: 4ft length and 4 inches cross-section, 5ft length and 5 inches cross-section or 4ft length and 5 inches diameter.

## Annex 11 List of organisations engaged in cultivation of medicinal plants

Organisation	Region of activity	Area (Acres)	ND/ FC/ EC	Medicinal plant(s)
Agrotech Limited	Haridwar (Uttaranchal)	Spread over 6 villages	ND/ FC	Papaya
Alembic	Gujarat, West Bengal	2,000	ND/ EC	Vasaka
Annpurna Biotech Limited	Andhra Pradesh	250	ND/ FC	Aswagandha, <i>Hyoscyamus</i> , Black Musli, Sarpagandha
Arya Vaidya Shala, Kottakal	Cauvery Basin		EC/ FC	Senna, Vakuchi, Shatawari, <i>Coscinium</i>
Baidyanath Ayurved Bhawan	Shivpuri, Lalitpur, Hajipur (Madhya Pradesh and Uttar Pradesh)	100	ND/ FC	Aswagandha, White Musli, Sarpagandha, Chandan, Asparagus, Priyangu
Basils Agro Farms Limited	Solan (Himachal Pradesh), Nurpur (Punjab)	50	ND/ FC	Asparagus, Basils, Thyme, Parsley, Celery
Burroughs Wellcome	Jammu and Kashmir	2,500 (Spread over)	FC/ EC	<i>Pruraria tuberosa</i> , <i>Digitalis</i>
Chemiloids	Aswaraopet (Khammam, Andhra Pradesh)	700	FC	<i>Strychnos</i> , Sadabahar, <i>Tylophora asthamatica</i>
Cipla Limited	Karnataka and Coimbatore (Tamil Nadu)	2,000	FC/ EC	Senna, Sadabahar
	Mangliwas (Rajasthan)	3,000 (Spread over)	ND/FC/EC	Guggulu
Crystal Biotech Limited	Haryana, Uttar Pradesh	400	ND/ FC	Lemon, Amla, Papaya
Dabur India Limited	Uttaranchal	74	ND/ FC	<i>Taxus</i> , Long Pepper, <i>Saussurea</i> , <i>Digitalis</i> , Acorus, Mentha, Lavender, Salvia, Aswagandha, Basils
	Birganj, Lamjung, Melumchi, Kathmandu, Dolkha, Viratnagar, Hiley (All in Nepal)	1,000	ND/ FC	<i>Saussurea</i> , Mints, Lavender, <i>Salvia</i> , <i>Taxus</i> , <i>Zanthoxylum</i> , Aswagandha, Basils, Saffron, Long pepper, <i>Swertia Chiraita</i>

Organisation	Region of activity	Area (Acres)	ND/ FC/ EC	Medicinal plant(s)
	Sandila (Lucknow)	200	FC (currently wasteland being re-claimed)	Amla, Mentha, Acorus, Basils, Chamomile, <i>Tylophora</i> , Lemon grass, <i>Euphorbia</i> , Mehandi
EID Parry's	Karnatka, Tamilnadu	1,200	FC/ EC	Neem
Enbee Plantations Limited	Budhni, Sehore, Hosur, Bhopal, Ichawar (Madhya Pradesh) Tirunelveli (Tamil Nadu) Satara (Maharashtra)	9,766	ND/ FC	White Musli, Sarpagandha, Aswagandha, Acorus, Isabgol, Musk Dan, Shatawari, <i>Bixa</i> , Sadabahar, Basils, Ginger, Garlic, Jaiphal
German Remedies Limited	Barabanki, Lucknow, Bareilly	4,000	EC/ FC	Chamomile
Glaxo India Limited	Karnataka and Andhra Pradesh border; Jodhpur, Pali (Rajasthan)		EC	Senna
Himalayan Drug Company	North India, Karnataka, Tamil Nadu	60,000	FC/ EC	<i>Aloe vera</i> , <i>Rauwolfia serpentina</i> , Aswagandha, Brahmi, Senna, <i>Saussurea lappa</i>
Hoechst India	Eastern Uttar Pradesh		FC/ EC	<i>Coleus forskohlii</i>
Indian Herbs	Saharanpur, Rampur	ND-100 FC-2000	ND/ EC/ FE	Acorus, Punarnava, Kalmegh
Indian Herbs with Horticulture Department	Bangalore	200 (on govt. waste land)	FC/ EC	Kalmegh, Basils
Jain Irrigation	Jalgaun (Maharashtra)	1,000	FC/ EC	Papaya
JVS Agrobases Limited	Kerala	24	ND/ FC	Mints, Mushrooms, Black pepper, Ginger
Lahul Potato Society	Lahul and Spiti, Kullu (Himachal Pradesh)	1,000	EC	<i>Saussurea lappa</i>
Lucky Laboratories Limited	Bulandshar (Uttar Pradesh)	50 (1,000 Area likely to be acquired)	ND/ FC	Amla, Ashok, Ashwagandha, <i>Hyoscyamus</i>

Organisation	Region of activity	Area (Acres)	ND/ FC/ EC	Medicinal plant(s)
Lupin Laboratories Limited	Rishikesh (Uttaranchal)	50	ND/ FC	Aswagandha, Isabgol, White Musli
Mr. Girish Sharma (NGO)	Ajmer (Rajasthan)	25	EC	<i>Aloe vera</i>
Narayandas Prajapati (NGO)	Jodhpur (Rajasthan)	400	FC/ EC	Aswagandha, <i>Aloe</i> , Acorus, Guggulu, Senna
Naturo worth Medico Plants	Uttar Pradesh, Madhya Pradesh	1,500	ND/ FC	Aswagandha, <i>Ocimum</i> , Mentha, Acorus, White Musk, Brahmi, Giloe, <i>Curcuma</i> , Ginger
Peru Tech Limited	Maharashtra	2,000	ND/ FC	Papaya, Garlic, Ginger
Pepsi Co.	Punjab/ Himachal Praesh	5,000	ND/ FC	Garlic, Ginger, Turmeric
Proctor and Gamble	All over India	100,000	EC	Mints
Save Earth Plantations	Bihar, Haryana	Spread over several villages	ND/ FC/ EC	Jawa, Lemon, Mints, Aswagandha, Brahmi, Papaya, Pachouli, Acorus
Southern Herbs	Kolar (Karnataka)	Spread over many villages	EC	Sadabahar

**Key:** ND – Nursery Development; FC – Field Cultivation; EC – Encourages Cultivation (including contract cultivation).

## Annex 12 Combined list of participants at preparatory and final project workshops

August 1999 and December 2000		
Name	Designation	Organisation
Dr. V. K. Bahuguna	Deputy Inspector General of forests	Ministry of Environment and Forests, New Delhi
Ms. Sutapa Baidya	Consultant	ETS, New Delhi
Mr. B. K. Banerjee		Federation of Indian Plywood & Panel Industry
Mr. H.K. Bhanwala	Assistant General Manager	NABARD, New Delhi
Mr. Jayesh Bhatia	Consultant	Tata Consultancy Services, New Delhi
Dr. Prodyut Bhattacharya	Assistant Professor	Indian Institute of Forest Management, B Bhopal
Mr. A. R. Chadha	Deputy Inspector General of Forests	Ministry of Environment and Forests, New Delhi
Mr. Raj Chaurasia	Chief General Manager	BILT Paper, New Delhi
Mr. Anoop Das	Research Scholar	Jawahar Lal Nehru University, New Delhi
Mr. D. K. Dhaukia	Manager (Raw Material)	BILT Paper, New Delhi
Dr. Alex Ekka		Indian Social Institute, New Delhi
Mr. V. B. Eswaran	Chairman	Society for Promotion of Wastelands Development, New Delhi
Dr. Barin Ganguli	Senior Forestry Consultant	Jaakko Poyry Consultants, New Delhi
Mr. Julian Gayfer	Forestry Advisor	DFID India
Mr. N. C. Gupta	General Manager	JK Corp Limited, New Delhi
Mr. R. D. Gupta	Senior Consultant	Agriculture Finance Corporation, New Delhi, Hyderabad

Dr. M. S. Haque	Deputy General Manager	NABARD, Mumbai
Mr. Ravi Hegde	Research Associate	Tata Energy Research Institute, New Delhi
Mr. Philippe Jacques	Resident Consultant	EC Delegation
Mr. P.K. Jain	Industrial Advisor	Department of Industrial Policy
Mr. Harsh Jaitley		Society for Participatory Research in Asia, New Delhi
Mr. N.K. Joshi	Consultant	WIMCO Seedlings Ltd., Rudrapur
Prof. Kanchan	Chopra Professor	Institute of Economic Growth, New Delhi
Mr. Arvind Khare	Director	Development Alliance, New Delhi
Dr. P.C Kotwal	Associate Professor	Indian Institute of Forest Management Bhopal
Mr. Chetan Kumar	Research Associate	Tata Energy Research Institute, New Delhi
Mr. Sudhir Kumar	Managing Director	Small Farmer's Agribusiness Consortium, New Delhi
Mr. H.N. Mathur	President	Society of Forest and Environment Mangement, New Delhi
Mr. V. P. Mohan	Former Principal Chief Conservator of Forests	Himachal Pradesh Forest Department, Shimla
Ms. Sunita Narain	Director	Centre for Science and Environment, New Delhi
Mr. Ajay Neodigy	Officer	BILT Paper, New Delhi
Mr. R.P. Mattoo	Chief Technical Director	ETS, New Delhi
Mr. V.K. Misra	Executive Director	Society for Promotion of Wastelands Development, New Delhi
Mr. Bhaskar Mitra	Research Associate	Indian Institute of Forest Management, Bhopal

Mr. A. K. Mukherji	Senior Advisor	NIIT-GIS Limited, New Delhi
Mr. C. P. Oberoi	Inspector General of Forests and special secretary	Ministry of Environment and Forests, New Delhi
Dr. N. C. Saxena	Secretary	Planning Commission, New Delhi
Mr. J.R. Sarangal	General Manager	NABARD, New Delhi
Ms. Madhu Sarin	Development Consultant	Chandigarh
Mr. Bhaskar Sen	Deputy General Manager	NABARD, New Delhi
Dr. Virinder Sharma	Environment Adviser	DFID India
Mr. O.P. Shrivastava	Freelance Consultant	Society of Forest and Environment Management, New Delhi
Mr. D. P. Singh	Advisor	Madhya Pradesh Government
Mr. Mudit Kumar Singh	Assistant Director General	Indian Council of Forestry Research and Education, Dehradun
Ms. Mamta Sinha	Representative Companies of India,	Association of Agri. Plantation New Delhi
Mr. N. K. Singh	Deputy Advisor	Planning Commission, New Delhi
Mr. Swarn Singh	Senior vice President	SAI Biotech Ltd., New Delhi
Dr. D. N. Tewari	Member	Planning Commission, New Delhi
Dr. Janaki Turaga	Senior Consultant	ETS, New Delhi
Mr. Pramod Tyagi	Programme Director	Society for Promotion of Wastelands Development, New Delhi
Ms. Hema Arora	Consultant	ETS, New Delhi
Ms. Anjali Bhatia	Consultant	ETS, New Delhi
Dr. Snigdha Chakraborty	Freelance consultant	

Mr. Piare Lal	Vice President	ITC Bhadrachalam Paperboards Ltd., Hyderabad
Ms. Elaine Morrison	Research Associate	International Institute of Environment and Development, London
Ms. Devaki Panini	Consultant	ETS, New Delhi
Dr Ram Prasad	Director	Indian Institute of Forest Management, Bhopal
Mr. S. S. Rizvi	Retired Joint Secretary and Former Executive Director	Society for Promotion of Wastelands Development, New Delhi
Mr. Sushil Saigal	Consultant	ETS, New Delhi
Dr. Gill Shepherd	Research Fellow	Overseas Development Institute, London
Dr. R. K. Shukla	Senior Consultant	National Council of Applied Economic Research, New Delhi
Ms. Daman Singh	Consultant	ETS, New Delhi
Mr. Niraj Subrat	Deputy Manager (Products)	Shree Baidyanath Ayurved Bhawan Limited, New Delhi