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ACHIEVING THE ITTO OBJECTIVE 2000 AND SUSTAINABLE FOREST MANAGEMENT IN INDIA

REPORT OF THE DIAGNOSTIC MISSION

EXECUTIVE SUMMARY

Report submitted to the International Tropical Timber Council by the Diagnostic Mission established pursuant to Decision 2(XXIX)

October 2006

"Common people need wood for fuel. They will continue to cut trees till the forest is destroyed. But the Muni (wise person) thinks about the importance of forests in relation to Nature. He thinks about the balance of natural agencies. He thinks of relationship of Forests and Climate…"

Bhagvatgita Chapter 3, Shloka 29

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The Mission received worthy comments, information and attention from various Government agencies, State Governments and Stakeholder Groups, including NGOs and the private sector. That was most useful for getting diverse insights about SFM in the country. Dr. Ram Prasad, the Principal National Consultant deserves special mention for his herculean efforts besides synthesizing technical papers of 18 national consultants and resource persons for the benefit of the mission and for the formulation of the National Status Report and its Executive Summary..

The role of Amity School of Natural Resources and Sustainable Development, as a National Facilitator was valuable. Its Founder President, Mr. Chauhan, devoted personal attention towards the successful arrangement of ‘Multi Stakeholders National Workshop for further strengthening of Sustainable Forest Management in India’, duly supported by the Amity focal point for the mission, Mr. B K P Sinha and other staff.

The Members of the Mission wish to express thanks to all those who participated in the preparation of this summary report. Nevertheless, the authors alone are responsible for any errors and inaccuracies, notwithstanding reasons beyond their control.

John Palmer Maharaj M. Muthoo Jürgen Blaser

Acronyms and Abbreviations

CEC	Central Empowerment Committee
C&I	Criteria & Indicators
FAO	Food and Agriculture Organization of United Nations
FDC	Forest Development Corporation
FSI	Forest Survey of India
FMU	Forest Management Units
GDP	Gross Domestic Product
GIS	Geographic information system
ICFRE	Indian Council of Forestry Research and Education
IIFM	Indian Institute of Forest Management
ITC	Indian Tobacco Company
ITTO	International Tropical Timber Organization
ITTC	International Tropical Timber Council
JFM	Joint Forest Management
JFMC	Joint Forest Management Committee
MoEF	Ministry of Environment & Forests
NAP	National Afforestation Programme

NDP	National Development Plan
NFAP	National Forestry Action Programme
NFC	National Forest Commission
NGO	Non Governmental Organisation
NREGA	National Rural Employment Guarantee Act
NTFP	Non Timber Forest Product
PESA	Panchayat Extension to The Schedule Areas
SFD	State Forest Department
SFM	Sustainable Forest Management
SFR	State of Forest Report
TOF	Tress Outside Forest
TEV	Total Economic Value
UN	United Nations
UNEP	United Nations Development Programme
VSS	Vana Samrakshana Samithi

CONTENTS

1 INTRODUCTION

Objectives of the mission

Within the framework of Decision 2(XXIX) of the International Tropical Timber Council (ITTC) entitled "ITTO Objective 2000", the Government of India, through the Ministry of Environment and Forests, submitted an official request to the ITTC in January 2006 for the visit of a technical mission to India in order to carry out a diagnosis of the forest management status of tropical forests in the country. The objective of the mission was to assist the Government of India "to identify those factors which most severely limit progress towards achieving Objective 2000 and sustainable forest management, and to formulate an action plan to overcome these constraints". The ITTO Objective 2000 is "sustainable management of tropical forests and transparent trade in tropical timber from sustainably managed resources".

Modus-Operandi of the mission

The mission included Maharaj Muthoo (India, Roman Forum) as the mission leader, Jürgen Blaser (Switzerland, Intercooperation) and John Palmer (United Kingdom, independent consultant) as international experts, and Ram Prasad (former director of the Indian Institute of Forest Management,) as the principal national consultant. The mission worked in the country as part of a process involving: (i) a series of background studies and the preparation of thematic papers by 18 local consultants and resource persons; (ii) review of data and information; (iii) an inception workshop at the Ministry of Environment & Forests (MoEF); (iv) briefing by officials and others concerned of the Central Government in New Delhi and at State level; (v) intensive individual meetings with the counterpart organization –MoEF and its collaborators; (vi) field visits and interaction with foresters and/or stakeholder groups in several States, e.g., Andhra Pradesh, Gujarat, Madhya Pradesh, Maharashtra, Orissa, and Tamil Nadu; (vii) visit to national forest education and research institutions at Dehradun; (viii) a conclusive multi-stakeholder workshop at Amity University; (ix) presentation of preliminary findings at the workshop and to the MoEF; and (x) analysis of the information collected and preparation of executive summary in close collaboration with the MoEF. The mission consulted more than 200 professionals and hundreds of stakeholders during village level and other consultations.

This summary and the detailed report are based on four pre-mission visits by the mission leader to India; 25 background papers prepared by 18 national consultants and resource persons; a national status report on forests and forestry in India and an associated executive summary; a national multi-stakeholder workshop at Amity University, Noida on 23 September when the preliminary findings of the mission were summarized and the national status report was released by the Minister of State for Environment & Forests, Shri Namo Narain Meena; visits by the mission members to the Ministry of Environment and Forests and to several States and forestry centres including those at Dehradun and Bhopal, often accompanied by or interacting with national counterparts and officers of the State Forest Departments (SFDs), Forest Development Corporations (FDCs), academic and research institutions, CSOs and the private sector, among others; Mission members had several interactive meetings with the Ministry of Environment and Forests, inter-alia, including the Ministers, the Director General of Forests and several ADGs, IGFs, DIGFs; among the latter involving the National Focal Point for ITTO in India

This executive summary attempts at succinctly synthesizing the variegated data derived from extensive documentation, first-hand feel of the situation at field level, and discussions with stakeholders in states and at the centre. The wide-ranging data and diverse opinions about major constraints and opportunities were found to be almost as diverse and large as India is. The Mission has tried to make this summary as close as possible to reflect the main and majority views, which are better presented in the main report of the mission under preparation.

2 AN OVERVIEW, ANALYSIS WITH DIAGNOSIS

2.1 NATIONAL CONTEXT FOR FORESTRY IN INDIA

India has 1.1 billion people - about one sixth of the world's population. It is projected 1.25 billion by 2020 and 1.4 billion by 2026, making India the most populous country. It has high density of is 336 inhabitants per km^2 compared with 48 as the world average.

The total land area is 3,287,590 sq km (*land:* 2,973,190 sq km, *water:* 314,400 sq km. Some 740 million of the population (68%) live in rural areas, of which well over 200 million are considered as forest-dependent, particularly the 90 million Scheduled Tribals**.** Small scale agriculture remains the mainstay of livelihoods, especially for 600 million farmers, and forest-based activities are highly significant in providing fuel, housing materials and gainful employment. The recent National Rural Employment Guarantee Scheme to ensure employment for 100 days in a year to each family, would make an important contribution to their livelihoods, in the face of the large mass of food insecure and poverty afflicted people, More than 300 million are subsisting on less than US$ 1 per day most of them living in forest-fringe areas. This is notwithstanding the fact that the economy has been growing at over 8 %.

India is federal republic with 28 states and 7 union territories[1]*. India's diverse economy encompasses widespread subsistence agriculture, handicrafts, ever expanding industries. Services are the major source of economic growth. However, three-fifths of the work-force is in agriculture and forestry (contributing about 20% of the GDP, including approximately 3% from forestry NTFP and primary processing and utilisation. The Government at its highest levels is articulating a new economic reform programme that includes developing basic infrastructure and enhancing agriculture productivity to improve, *inter alia*, the lives of the rural poor and boost economic performance. There is hardly ever any Party mention of the forest sector or the destitute poorest-of-poor forest-dependent communities, except about animal reserves and particularly tigers and elephants.

The huge and growing population is an important social, economic, and environmental issue. The most recent UN Special Report on the Rights of Food stated that over the past 10 years, falling agricultural wages, increasing landlessness, rising food prices and environmental degradation in India reduced food grain availability to 152 kg per capita, 23 kg less than in the 1990s. The poorest 30 per cent of the households live with less than 1700 kilocalories per day per person (international minimum standard 2100 kilocalories) and spend 70% of their income on food. India’s rapid urbanization is often taking agricultural land out of production and into infrastructure and housing. While agricultural production and incomes are falling, farmers might be forced back against and across the boundaries of notified forest, unless intensified agriculture and alternative livelihoods are available to the millions of poorer farmers.

2.2 STATUS OF THE FOREST RESOURCES

Forest area and forest cover. Systematic, consistent and accurate information on the geographic extent and bio-physical condition of the forest in India is lacking. Forest is defined as a tract of land that is legally proclaimed to be a forest under the forest laws (mainly 1865 and 1927) and is notified as forest in the government gazette. The latest state of forest report (SFR), 2003, indicates a notified forest area of 77.47 million ha (or 23.6% of the country’s area), comprising 39.99 million ha of Reserved Forests, 23.84 million ha of Protected Forests[2] and 13.63 million ha of Unclassified Forests. Reserved Forest is an area notified under the provisions of the Indian Forest Act or a State Forest Act having a greater degree of protection (all human activities are prohibited unless expressly permitted). Protected Forests are also notified under the Forest Acts but the restrictions are less severe (all human activities are permitted unless expressly prohibited). Unclassified Forest is an area recorded as forest but not included in reserved or protected forest categories; tenurial ownership of such forests varies from forest to forest and State to State.

The 2003 forest cover analysis by the Forest Survey of India using satellite data, including forests of a defined area of more than 1 ha and 10% of tree canopy cover, indicates a total forest and tree cover of 67.83 million ha, comprising 5.13 million ha of very dense forests (8% of total forest cover, above 70% of canopy density), 33.93 million ha of moderately dense forests (50% of total forest cover, 40-70% of canopy

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[1] States that are outside the geographic tropics (those States north of the Tropic of Cancer) are marked with * in the main report

[2] Protected forests mainly include forests expropriated from zamindars (landlords with large holdings often held *in absentia*) in the 1950s. Officially all protected forests are in an administrative process to be declared as reserved forests, without re-visiting the original arrangements for settlement of claims to rights or for boundaries. Unclassified forest also is in a process for legal recognition as forests; however, in many cases, State Revenue Departments contest that process. Protected forests generally are not properly demarcated on the ground, and dispute is frequent. Reserved forests are generally demarcated but include intact forests, degraded forest and forest land without forest cover. Data on the forest cover in each category of notified forest are lacking.

density), and 28.78 million ha of open forests (42% of total forest cover, between 10 and 40% of canopy density). The FAO Forest Resource Assessment 2005 states that India has about 64.1 million ha of forest cover (or 20.3% of the country's area), allocated among dense forest (59%), open forest (40%) and coastal mangrove (1%).

Of the total forest area, about half is under natural forest cover, and the rest (about 33 million ha) is planted forest. This latter includes farm forests, agro-forestry sites and agro-industrial tree plantations outside the notified forests as defined above.

Forest types. There are 16 broad forest vegetation types defined according to biophysical criteria by Champion and Seth (1968): tropical wet evergreen, tropical semi-evergreen, tropical moist deciduous, littoral and swamp, tropical dry deciduous, tropical thorn, tropical dry evergreen, sub-tropical broad-leaved hill, sub-tropical pine, sub-tropical dry evergreen, montane wet temperate, and others. Moist deciduous and dry deciduous forests together add up to 67% of the total, tropical wet evergreen forests account for another 13%. Tropical and subtropical forest cover is estimated at 51.5 million ha in the SFR report (2003) corresponding to 73% of the entire forest cover of India[3].

Dynamics of forest resource change. Forest degradation and deforestation have happened in India due to unsustainable practices and pressures from agro-pastoral activities and other land uses. During the 1970s, India's annual rate of deforestation was 1.3 million ha due to forest conversion to other land uses. In the 1990s, the situation is said to have changed to one of net gain of forests assessed at about 25,000 ha per year since 2000. This is mainly due to extensive planting of trees and wood lots outside forest areas. In contrast, natural forest is being lost over the same period at a rate of 30,000 to 40,000 ha per year due to conversion to non-forest use[4]. The Forest (Conservation) Act 1980 intentionally makes difficult the formal excision or de-reservation of notified forest. However, at least some SFDs have authorised what are effectively permanent changes in land use (known as "diversion") without de-reservation.

Irrespective of the apparent reduction in net deforestation, natural forest degradation is continuing. According to the Forest Survey of India (FSI 2003), the area of dense-cover forests has reduced by 2.62 million hectares between 2001 and 2003 to a total of 39.0 million ha, which corresponds to a loss of dense tree cover of 6.2% in two years; Average wood volume has fallen from a level of 47 m3/ha in 1990 to 43 m3/ha in 2000; the fall in the stock of above ground biomass has been from 93 metric tonnes/ha in 1990 to 73 metric tonnes/ha in 2000. Nevertheless, the SFR 2003 does not provide sampling errors for its estimates. Moreover, the decrease in dense forest cover to the extent of 21,640 sq. km. due to interpretational corrections mostly in 1 to 25 patches outside the recorded forests such as crops of cotton and sugarcane etc. which give reflectance similar to that of forest cover is a matter of significant ambiguity. It is thus, not possible to infer that differences between 2001 and 2003 are statistically significant, although the trends are apparently consistent with past data.

From a variety of commentaries on the quality of the forest cover, it is clear that the forests in India are degrading through continue pressures. Hence deforestation has to be assessed in terms of loss in quantity and quality of natural forests. Afforestation through increasing agro-forestry crops and wood lots raised by farmers and other private sector enterprises does not necessarily offset losses of natural forests and their ecosystem functions, including biodiversity and habitat attributes.

Continuing deforestation through encroachment in notified forest areas, in particular protected forests and unclassified forests, and through excision of reserved forests, have made the security tenuous for what was intended to be the permanent forest estate. Excessive harvesting of fuelwood, non-timber forest products, poles and timber, including illegal logging (so-called "unrecorded") activities in forest areas have exacerbated the situation. Although there may be local empirical knowledge of the factors leading to forest

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[3] In this report the forests of the higher zones of Himalayas in the states of Jammu & Kashmir, Himachal Pradesh, Uttaranchal and Arunachal Pradesh are excluded from the overall analysis. All other forest areas are considered tropical.

[4] According to FAO's Forest Resource Assessment 2000 (FAO, 2001), while natural forest was lost at a rate of 1,896,700 ha annually during the 1990s, the area under planted forest increased at a rate of 1,934,800 ha annually, leading to a net annual increase of 38,100 ha in the forest area. The net gain shown in the forest area is contentious, because of the inclusion of rubber plantations, farm wood lots and home gardens as forests, which hitherto were considered as outside the FAO definition of forest

degradation, the monitoring mechanisms and limited resources of SFDs do not enable coordinated or effective measures to reduce progressive reduction in natural forest resources assets.

The urgency for controlling the continuing forest degradation is boldly underlined by the overall impact on ecology. Nearly half of the country's land surface is degraded, affected by soil degradation and erosion, as has been indicated in the last report of the Wasteland Development Board.

Land-use planning. In spite of debates extending over decades, there is no effective national land capability mapping or integrated land use planning. A Central government unit for coordination of land capability survey and land use planning, together with State inter-departmental Land Use Boards, existed until the late 1980s when they were abolished; inter-sectoral institutions having less of a constituency than departmental organisations. Since then, demographic pressures have risen and demands on natural resources (both renewable and wasting assets) have increased as India has developed. In the absence of such coordination, and in the absence of formal setting of priorities between competing land uses in the National Constitution, conflicts over priorities in land use – such as between agriculture, forestry, housing, industry, infrastructure, livestock, mining, tourism, water structures and reservoirs cannot be resolved by appeal to Central or Union policies or legislation.

Lack of coordination in land use planning is compounded by the complexities of land tenure. The lack of systems to avoid or resolve land use conflicts is evident in the frequent reportages of corruption in land dealings, especially in peri-urban areas as cities expand and formerly arable and forest lands are converted into housing lots and industrial plots. The regulation of de-reservation and excision from notified forests, under the Forest (Conservation) Act 1980, as amended, makes *ad hoc* diversion into other land uses almost inevitable in areas of land competition. These diversions in land use are covered by SFD *pattas* (land use leases of defined periods such as 5 or 10 years), similar to the agricultural leases granted by the Revenue Department. The SFDs are hampered in defending the boundaries of notified forests by the antique ways of valuing forest resources (according to the out-of-date royalty values, not by total economic value) which are the prevailing practice at State and Central levels. This remains a social and economic anomaly.

2.3 POLICY, LEGAL AND INSTITUTIONAL ARRANGEMENTS IN FORESTRY

Forest tenure. All the notified forests are under the de-facto ownership and administration of the States not Central government till 1976. With the farmers and rural households and commercial enterprises engaging in growing trees outside the legally defined forests, a new category of private forest owners of farm forests, home gardens, agro-industrial plantations is emerging as significant players in the arena of Indian forestry. The Forest Survey of India does not differentiate between forest cover in notified forest areas. It is noted that, by July, 2006, 65% of the forest area surveyed by FSI in 2003 is administered solely by the States and 28% or so are reserved for community and tribal groups through Joint Forest Management (JFM) and related schemes. By July 2005, 21.5 million ha had been allocated for JFM. The process is still ongoing on. These forest areas, if located on notified forest land, are still largely administered by the government. About 8% of the land with forest cover is managed by private households on farms or by industries.

In the three decades to 1976, SFDs lost considerable areas of forest, perhaps 4.5 million ha in total, through de-reservation by direction of the State governments to meet the needs for development. Excised and diverted areas were not always recorded in both the SFD and Revenue Department records, so interpretations of legal boundaries have tended to be subjective. The protected forests were notified but their boundaries were not necessarily demarcated, surveyed or mapped.

Some States since the 1960s have attempted to resolve boundary questions by joint Forest and Revenue Department survey, but like other inter-sectoral activities such work has been intermittent because of problems in joint budgeting. The Forest (Conservation) Act 1980 at least laid down the principle of no de-reservation or excision of notified forest land, but same disputes continue. Diversion has dropped from about 150,000 ha per year to 15,000 ha annually since 1980.

The joint demarcation process was itself complex, with local rules about allocation of near-village lands for exercise of communal rights of collection of forest products and use of forest lands for domestic purposes including fodder collection and dry-season grazing; such rights include *nistar* and *haq-haqook*, and are especially important to the forest-dependent tribal peoples. Slivers of land could also be held outside the forest boundary for future agricultural use. At the same time, Revenue Department land "having good forest or surrounded by forest area" was included in notified forest; apparently without going through the

settlement procedure for claims and rights which was prescribed for SFD reserved forests. Areas claimed by the SFDs but not surveyed and demarcated were coloured orange on maps. These unclassified notified forests are subject to disputes.

An element of the order of Hon'ble Supreme Court in 1996 in a ruling that the word 'forest' must be understood according to its dictionary meaning. This description covers all statutorily recognized forests, whether designated as reserved, protected or otherwise for the purpose of Section 2 (i) of Forest Conservation Act (1980). The Supreme Court is thus a relatively new but decisive player in the forestry sector. It has introduced bans on green felling in a number of States, which include all the north-eastern States, and areas where forest management (work) plans have not been prepared or revised after expiration. In addition, where working plans are in place, irrevocable financial allocation for regeneration must be made prior to timber harvesting. All this and the 1996 ruling signifies the commitment at highest levels to the sustainable management and conservation of the country's forest resources. At the same time, concerns remain and measures are afoot in several states to remove hurdles for off-reserve tree planting and tree management on village and private lands, which are nevertheless driven more by the income incentive and market mechanism.

The advent of geomatic units in SFDs, equipped with GIS and trained staff, is helping to identify areas of boundary confusion. Meanwhile, in the Northeastern States and in Jharkhand, Orissa, Uttaranchal and West Bengal, community-defined and traditionally–managed forests have been notified by SFDs as unclassified forests and have accordingly not been placed under formal working plans. Some of these communities have expressed concern during 2006 about moves by the SFDs to convert the unclassified into reserved forest, when the real field capability of the SFDs to improve management over that exercised by the communities remains doubtful. Some of these community forests have been in existence from time immemorial.

Policy framework. India is a federal union of states. At independence in 1947, forestry was assigned to the States List but in 1976 (42nd amendment to the Constitution) it was made a Concurrent List subject; that is, the States having responsibility for sustainable forest management (SFM) subject to certain controls by the Central government.

There have been almost 140 years of successive policy statements about sustainable forest management since the creation of the government forest service in 1864. Circular F22 of 1894, the first formal policy statement as distinct from legislation in 1865 and 1878, was explicit about the first call on forest goods being the satisfaction of local (village) needs, subject to the test of overriding national interest. This policy has been repeated in the 1988 statement (sections 4.3.4.3 and 4.3.4.4 and 4.9). The evolution of the policy and legal framework in independent India since 1947 shows a focus for satisfying industrial needs for timber (1952) but later to biotic conservation (law in 1980 and policy in 1988), while neglecting village and local community needs up to 1976. This was followed by a period between 1976 and 1978 with commercial forestry intensified on forest land but also an increased attention for social and farm forestry on non-forest land including community land (Revenue Department land), on private lands and on degraded forest land to meet people's demand - the so-called social forestry era.

Subsequently, the 1988 National Forest Policy embodied most elements of sustainable forest management. It focused on maintenance of environmental stability and restoration of ecological balance; conservation of the country's natural heritage and biological diversity; improved soil and water conservation; increasing forest cover through massive afforestation and social forestry programmes (to the 1952 target of 33% of the country's total land area); providing the basic needs of the rural and tribal population; increasing forest productivity; improving efficiency of forest product utilisation; and minimising the pressure on the existing forests. The policy stipulated that requirements for industrial wood should be met increasingly from trees outside forests. It is however noteworthy that the reiterated target of 33% forest cover is backstopped neither by any in-depth assessment of the need, nature and scope nor by institutions and resources to achieve the target. It is a pious dream.

The 1988 policy is under permanent scrutiny by the multiple interests at local, state and central level, communities, industries, lobbyists and national development agencies. Some people criticise the policy for being too orientated towards conservation and not taking into account the need of rural households, consumers and industries to fulfil burgeoning demands for forest products. Others criticise the policy for perpetuating the all-encompassing role of the forest service in its implementation, making it impossible for the forest service to adapt to new roles in a changing society. The recent report of the National Forest Commission (NFC, 2006) endorses in principle the validity of the main thrusts of the 1988 forest policy, but

does so without detailed examination. The NFC report does not question whether the 33 % forest cover target is a pious pipe dream, which it so far seems to be, like a vista vision without action. This and related policy perspectives warrant an in-depth review and updating in the context of evolving scenario. The priorities of the States are often at variance with national priorities (particularly relating to forest conservation and industrial modernisation). Forest governance is faced with several problems of serious nature and dimensions.

Moreover, the 1988 policy did not consider factors which are now recognised globally to be important goods and services provided by forests. These include tangibles such as perennial supplies of clean water, reduction in atmospheric pollution, genetic conservation of plants related to staple crops, bio-energy crops, and carbon sequestration; and intangibles such conservation of both species diversity and habitat, aesthetic landscapes and cultural features and associated tourism, and public health through forest-based recreation. Some of these factors are marketable, some have potential markets. The 1988 policy did not consider forest resource accounting or any natural resources accounting, such as compilation of total economic value and cross-sectoral convergence between the forests, environment and development. While some forest policy people and practitioners are not averse to these interdisciplinary issues, the civil society is quite conscious and keen to address these heightening concerns, as for instance the CSE, TERI and Amity University.

A National Forestry Action Programme (NFAP) has been elaborated in 1999 by MoEF with the support of FAO. However, it has not been used to shape policy and the legal framework so far, for want of will and wherewithal or whatever other reasons. This seems so much in contrast with many countries which have leveraged the NFAP for strengthening SFM locally and nationally.

Forest Legal Framework. Under the above-mentioned 42nd amendment to the Constitution of the Indian Union, national and state governments share jurisdiction for forestry on the Concurrent List. The national level sets the broad legal framework through national laws and related regulative frameworks. The principal guiding legislation still current in India is the Indian Forest Act of 1927 and the Forest (Conservation) Act of 1980. While the policies have undergone changes, the basic legislation has not correspondingly changed; it focuses on prevention of offences rather than on promotion of development. The Forest (Conservation) Act 1980 applies to all lands which are notified as forests in the government gazette. It restricts the powers of State governments by making it mandatory to seek permission from MoEF for any non-forest use of forest lands. The law also regulates forest land claims by tribal people.

The Wildlife (Protection) Act of 1972, amended in 1991, provides protection of species of mammals and birds which are listed in the schedules of the Act. The Act includes provision for the creation of national parks and sanctuaries and puts severe restrictions on people's rights within such protected areas.

The Provisions of the Panchayats (extension to the Scheduled Areas) Act, 1996 – known as the PESA Act – could have considerable implications for the governance and management of forest villages (inside notified forest). However, there seems to be no consensus on those implications. There are concerns that conversion of forest villages into Revenue villages could provide an incentive for unsustainable land management and harvesting of resources.

A Scheduled Tribes (Recognition of Forest Rights) Bill was drafted in 2005 and is under debate in Parliament. It proposes to recognize historic lands rights held by tribal people in forest areas irrespective of the legal status. The Bill does not contain tests by which claims could be validated. The reports of the Settlement Officers at the time of original reservation of forests are likely to contain the most complete records of oral claims then made for historic rights, given that the affected people mostly did not have their own written records. If tribal rights evolve in India as they do in other countries with natural forest cover, then what was recorded in the late 1800s may be quite different from rights as perceived today. But then they would not be the historic rights which the Bill claims were denied. No tests for sustainable practices are provided in the Bill. Some wildlife conservationists fear that the Bill could lead to over-hunting. It is clear that the Bill is poorly drafted and needs considerable amendment.

Within the ambit of the national policy and legislation, the States can promulgate legal instruments and undertake suitable measures to facilitate smooth functioning of the sector. A number of State laws have been passed to regulate forest resource use, including timber and non-timber forest products (NTFPs).

Considering the overall national laws and the various laws at State level it is evident that the legislative framework centralizes decision making mainly at the Central government (MoEF) level and the establishment of State monopsonies and monopolies for the harvest or purchase/sale of a number of

important forest products at the State levels. These exclusive rights include the pre-Raj "royal" timber species such as red sanders (*Pterocarpus santalinus*), sal (*Shorea robusta*), sandalwood (*Santalum album*) and teak (*Tectona grandis*). Three NTFPs have also been "nationalised" in the States in which they occur: tendu (or kendu) leaves for wrapping "country" cigarettes (bidis), seeds of sal, and kullu gum or gum karaya from *Sterculia urens*. Different States have "nationalised" market control over different numbers of NTFPs. There are up to 120 in Kerala, but all NTFPs have been de-nationalised in Orissa. The current rationale for this extra administrative burden on SFDs escapes the ITTO mission. Moreover, the below-market price paid by the State buying agencies seems to contradict directly the claim that nationalised marketing enhances the livelihoods of the mainly tribal NTFP collectors. There are pressures on the government to reduce consumption of tobacco because of the costs to public health. It is not clear if MoEF, the SFDs, or the federations of minor forest product producers have evaluated the potential impact on rural livelihoods if smoking is banned and the market declines for tendu leaves.

Institutions in charge of forests. At the national level, forestry falls under the MoEF. There are forest services at the Central and State Levels, having defined functions and responsibilities according to the Concurrent List. While at the Central level the role of the MoEF is mostly in the nature of providing policy, strategy and legislation developments and at the State level the State Forest Departments (SFDs) play the prime role as custodians of the public forest resource, carrying out the normative and regulatory, silvicultural and protection functions. Often they also perform an enterprise function by being involved in forest production, processing and trade. All the forested states in India have set up Forest Development Corporations (FDCs) to be responsible for the production activities of the public forest estate. These corporations are meant to operate as autonomous business entities but in effect most of them function as extension of the forest departments and enjoy hidden subsidies by harvesting from natural forest. Not all of the FDCs are still active.

There are a number of specialized institutions directly linked to MoEF. These include the network of 8 institutions under the Indian Council of Forestry Research and Education (ICFRE); the independent Indian Institute of Forest Management, Bhopal (IIFM); Indira Gandhi National Forest Academy, Dehra Dun; the Wildlife Institute of India, Dehradun; and Forest Survey of India, Dehra Dun. The major institutions carrying out forestry research in India (ICFRE and the Forest Research Institutes or Research Divisions of SFDs) are core-funded by the Government but at a rather low level.

Funding of forestry. Out of a total development budget of Rs.1,388.9 million (US$ 31 million) of the MoEF (financial year 2005-6), the Forest and Wildlife Department in charge of forestry has a share of Rs. 462 million or 33%, including Rs. 140 million for wildlife protection, Rs. 260 million for the national afforestation program and the eco-development programme (in Protected Areas), Rs. 41 million for forest protection and Rs. 21 million for education and training. Each State has budgets for its Forest Department divided along similar lines. Though the forest services (MoEF and SFDs) generally have large staffs and semi-military hierarchies, it is evident that operational funds are scarce or non-existent in core budgets. The real scope for forest development activities, in particular recapitalization of forest resources after unsustainable harvests, is extremely limited. Joint forest management and related schemes and other forest conservation activities are implemented on a moderate scale only in those States where external funding is available as an additional resource.

All SFDs have growing core establishment costs, in salaries and social security, especially pensions. At the same time, the State Finance Departments are almost bankrupt. Financial aid from multilateral and bilateral donor agencies is treated as fungible, helping to stave off that bankruptcy, rather than as additional support for field operations.

It is unclear if the traditional sale of resource access rights by SFDs at below replacement cost is affecting the ability of SFDs to bid effectively for State funds. The issue is clouded because budget estimates approved centrally are not necessarily reflected in allocations at State level, and allocations do not always appear as operational funds. Furthermore, delays in release of government funds may compromise SFD operational plans, because of the need to time field work at appropriate times in the seasons of the year. On an average, expenditure is about 51% of the allocation.

Human resources and human resource development. India has a long-standing tradition of forest service and is hierarchically structured from the level of locally trained uniformed forest guards and foresters with policing functions upwards to Dehradun trained elite forest service officers recruited by the Union Public Service Commission. Foresters of all levels are well trained in traditional technical forest-related subjects. In

many regions, the forest service is still perceived as overly concerned with law enforcement and susceptible to corruption, though declining.

Foresters, like other civil servants, are rotated very frequently. Younger forest officers complain that internal promotion is on seniority and not on merit and suitability. Generally, the age pyramid of forest officers, especially field foresters, shows a bias towards older age; for example, in Madhya Pradesh, the average age of forest guards is 50, the average age of foresters is 55 and the last recruitments for these positions have been made in 1980. The ageing scenario is not much different in many states, often without filling vacant posts.

Equally and even more seriously, there are few functional relationships between the forest services and other public services working in rural areas, such as water and watershed management, agricultural and livestock extension, land tenure records and regulation, infrastructure improvement and social services.

Role of NGOs in forestry. The 1988 policy confined Non-Governmental Organizations (NGOs) to a minor role in assisting in the delivery of rural development. There are thousands of NGOs and NGO groupings in India which have the requisite strength and experience to support communities in organizing themselves, to provide training, to deliver extension services, to identify income earning activities and to facilitate market access. SFDs often are reluctant to include NGOs in rural extension work, the development of micro plans and other activities in joint forest management schemes. NGOs could play an important monitoring and communication role, especially between communities and forest services. The role of NGOs will become even more crucial once recapitalization work in community managed forest areas begins and revenues from forest-related activities are brought to the communities. Equity issues, conflict resolution and development oriented investments at community level may be more effectively managed by NGOs trusted by the forest-dependent communities than by normative and regulatory SFDs.

Major NGOs can play a significant and effective role in policy analyses and developments. Knowledgeable, experienced and dedicated NGOs could enter into civil society consultations with governments at national and local levels as collaborative partners for the purpose. There are a number of reputed NGOs in well rooted in field experience which the SFDs could usefully draw upon their skills and delivery capability.

2.4 STATUS OF FOREST MANAGEMENT

2.4.1 Forest for production

Joint Forest Management. JFM, known under different denominations in the various states[5], is the principal forest management strategy which was introduced through the 1988 forest policy after several years of empirical development in various locations with the aid of funding from the Ford Foundation. The 1988 policy was followed by a specific circular from the MoEF on 1 June 1990, enabling SFDs and village communities to enter into agreements jointly to protect and manage notified forest land, particularly those which were categorized as degraded forests (canopy cover 40% or less). The MoEF circular was interpreted at State level by Resolutions which vary from State to State. On 14 February 2000 the MoEF issued revised guidelines in which they recommended that dense forest areas (canopy cover >40%) could also be given to communities for JFM.

JFM has also been introduced in certain States on community land outside notified forest areas (e.g. Haryana). JFM schemes have been particularly engaged in increasing fast growing plantation areas (eucalypts, acacia, poplar, bamboo, and more recently bio-diesel plantations with *Pongamia* and *Jatropha*). By September 2006, nearly 100,000 JFM Committees (JFMCs) have been created in all the States, engaged in protection and regeneration of about 22 million hectares of notified forests and plantations outside the forest area in return for defined usufructs and other benefits. The rapid expansion in numbers of JFMCs is said to be in part a function of donor target setting. Certainly, the capacity building necessary for the JFMCs

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[5] Joint Forest Management Schemes are known under different denominations in the different States in India. The variety of arrangements in the State-level JFM Resolutions mean that the schemes provide for different sharings of responsibilities and benefits. Scheme names include: EDC (Eco-Development Committee around protected areas); FPC (Forest Protection Committee for dense forests); JFPM (Joint Forest Planning and Management); Van Panchayats (community forest); VFC (Village Forest Committee for degraded forests, VSS (Van Sanrakhasana Samiti/forest conservation committee) and self-initiated forest protection group (SIFPG).

to become fully effective is a major challenge when SFD operating finance is so limited and when the much larger resources of the Rural Development Department are as yet not fully engaged.

JFM schemes vary enormously from State to State, mainly dependent on the resources available for restoring tree cover, managing NTFPs and other developmental activities at the level of the communities. Further improvements should include an action learning approach, appropriate monitoring and integration of research-development activities. While the SFDs are quick to claim increasing areas under JFM, the constitution of a village forest committee or similar body does not necessarily imply that the whole forest area assigned to joint forest management will immediately be managed under joint arrangements. It is learnt from the field that many JFM schemes are not adequately active with demonstrative sharing of rights, responsibilities and benefits. But there are some good exceptions, e.g., the State of Andhra Pradesh with more than 9000 so-called VSS. Through two linked World Bank loans, the JFM scheme recapitalized many forest areas, i.e., restored forest productivity to probable pre-degradation levels. Orissa is also in the process of revamping its approach to JFM for promoting pro-poor growth. Poverty alleviation through integrated forest production can be an explicit aim in a JFM scheme.

Benefit sharing in JFM. Confirmation of rights of access to forest resources, such as fuelwood and fodder, is perhaps the greatest common benefit of JFM schemes. Most of them are too young to be producing timber in saleable dimensions. Ford Foundation-sponsored and various other researches have emphasised the need to clarify arrangements for calculating and disbursing benefits equitably amongst participating scheme members. Inequitable benefit capture by village elites would be highly detrimental to JFM credibility. NGOs are probably better placed than SFDs to provide training and mentoring in social cohesion, bookkeeping and benefit sharing.

Natural forest management framework. India follows in principle a system of preparation and periodical revision of Working Plans for established Forest Divisions[6] in notified forests. 75% of notified forests are under prescriptions of Working Plans in 2005, up from 54% in 1980. Some such plans seen by the ITTO mission are literally heavy on compartment history but seem to be weak on strategic consideration of options for flexible management in response to changing circumstances. They do not seem to refer to other, State level, documents which develop scenarios of options and suggest priorities. The working plans are thus tactical documents but lack a strategic framework. Moreover, they do not seem to include model-based yield calculations and predictions.

Improved statistical reporting of forest management, and standardisation of aspects to be evaluated for reports, has been initiated with the development by IIFM of a set of Criteria & Indicators (C&I) for sustainably managing the dry zone forests of India. This development, the Bhopal-India process, is based on the ITTO set of Criteria & Indicators for statistical reporting on (changes in) quality and quantity of forest management. Two States, Chhattisgarh and Madhya Pradesh, have implemented the Bhopal-India C&Is into some Divisions. A wealth of documents including newsletters and conference proceedings are available from the ITTO-funded C&I project at IIFM, Madhya Pradesh. It is unclear why internalisation of the C&I set is slow in other States but the lack of motivation is one factor. Recently MoEF, Government of India, has constituted SFM Cell to give impetus to this process with the ultimate aim of adopting improved criteria and indicators for SFM at the National level and its detailed inclusion in Working Plan code.

Natural forest management implementation. Management of reserved and protected forest is often the direct responsibility of the SFDs. Some States, e.g. Andhra Pradesh, are developing joint management schemes in closed-canopy areas of natural forest. Silvicultural harvesting of teak, sal and other natural forests is being carried according to working plan prescriptions in some States (e.g. Chhattisgarh, Gujarat, Madhya Pradesh, Maharashtra, Orissa). In other States, only salvage fellings of dead, damaged and diseased trees are allowed. Harvesting operations are mostly done using simple hand tools such as axe and crosscut saws, which are associated with high wastage of valuable butt logs. There seems to be no application of reduced-impact logging. Trees tend to be bucked into much shorter lengths than in other tropical countries, perhaps reflecting the low power and small size of extraction equipment. Because of secondary processing after grading at log depots, total timber recovery rates are high. However, this is not necessarily the same as high rates of value addition.

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[6] Forest Management Units (FMUs) are organised at SFD Division level in India, rather than at the level of the individual Forest Reserve as in most other countries. This may become a problem if forest certification comes into operation.

Several silvicultural systems are prescribed in the working plans for Indian natural forests, differing according to the ecological potentials of the dominant timber species – selection system in the wet evergreen and semi-evergreen forests; shelterwood system in the coniferous forests and certain types of moist deciduous forests; gap felling and coppice management in dry deciduous forests. Main commercial timber species in natural forests in tropical areas with wide distribution include *Acacia catechu, Adina cordifolia, Albizzia lebbek* (kokko), *Cedrela toona, Dalbergia latifolia* (rosewood) *Dalbergia sisoo* (shisham)**,** *Gmelina arborea* (gamari, yemane), *Grewia* spp, *Largerstroemia lanceolata, Pterocarpus* spp., *Shorea robusta (*sal*), Tectona grandis, Terminalia paniculata, T. tomentosa* (laurel) and *Xylia xylocarpa.*

Mangrove forests may occupy some 1000 km of coastline and are now mainly valued for the protection which they afford during cyclones and tsunamis, as well as for their roles in fish spawning habitats, fish nurseries and crustacean culture. However, in West Bengal, the Sunderban mangroves have been intensively managed and timber-harvested for decades.

Plantation forestry. Of the plantation area of 32.6 million ha, nearly 45% is accounted for by fast growing (and short rotation) species of *Eucalyptus* (increasingly, the clonal varieties), *Acacia* spp., *Casuarina* spp., and poplar in subtropical areas. Teak accounts for about 8%; pines and other conifers (in temperate zones) about 10%. The remaining area is occupied by other broad-leaved species (including rubber). About 25% of all wood lot plantations (8 million ha) are those planted in private and communal land. 50% of all plantations raised since 1980 are in agro-forestry (or at least non-notified forest) environment, with varying intensities of management. Current annual planting rate is estimated to be 1.5 million ha, of which public planting (mainly by FDCs) takes 2/3 and private planting about 1/3. In addition to the area shown under forest plantations, India has extensive areas under agro-industrial plantations of coconut (2.15 million ha) and an area of at least 1 million ha of rubber.

While impressive in area, the performance of forest plantations, in terms of survival, growth and yield has been generally poor over the last two decades. Overall, plantation forests in most cases were not able to compensate in ecological terms for the related loss and degradation of natural forests. This is well understood: the plantations are complementary to the natural forests. Of more concern are the inadequacies in site selection and site-species matching, poor-quality planting stock, and lack of maintenance and protection. Forest plantations being a major investment activity (according to the area and scheme, establishment costs are Rs. 15,000-25,000 per ha (US$ 350-600 per ha), the consequent low level of productivity is a cause of concern.

The National Forest Policy 1988 has encouraged the forest-based industrial units to make increased effort to obtain their raw material requirement from local private sources. The Land Ceiling Act of 1952 prohibits private holdings on “wasteland” larger than 50 acres (28 ha). This is a serious impediment against the economies of scale that come with large blocks of intensively managed plantations and increases the cost of production of industrial wood relative to the world market price. This has prompted some large pulp and paper companies to promote farm forestry through support for research-development-application, technology extension for establishing clonal plantations, and a buy-back guarantee for the pulpwood produced. A large number of tree farming and agro-forestry enterprises have sprung up all over the country, although in the first decade there were some financial scams when associated with promises related to insurance backing; as elsewhere in the tropics. While the current generation of private plantations are considerably more productive, these initiatives are not supported in commensurate measure by Central and State governments. Support could be demonstrated through removing unreasonable regulations which create hurdles to private forestry development, e.g., the restrictions on access to open markets for timber. It has been widely accepted that there is an urgent need to loosen bureaucratic control and simplify procedures to allow the private sector to contribute more effectively.

The flagship government-driven forest plantation programme since 2002 is the National Afforestation Programme (NAP) that subsidizes tree planting and forest restoration. According to MoEF statistics about 4.2 million ha have been planted under the NAP in notified forest areas over the past 4 years[7].

[7] This figure is derived from distribution of seedlings to JFM scheme, forest corporations and other entities. It is highly questionable that all distributed seedlings were planted or have survived in reality at the planned density of 2000 plants per ha.

Trees outside forests (TOFs). The FSI survey (2003) estimates that more than 2680 million trees in patches of 1 ha and larger are found on private and community land outside the notified forest boundaries, which corresponds to an average tree density of 12.3 trees per ha. These trees are the major source of industrial wood in the country, contributing to about 3 times more to the industry than timber from notified forest areas. Trees outside forests are mainly planted by farmers and private investors for economic purposes. With exceptions of few States that do not have large extents of notified forest areas, the SFDs do not need to engage in planting TOFs. SFDs should concentrate on helping to create positive enabling conditions. This include on the one hand the removal of certain legal hurdles in many of the Indian states, such as restricting rules on felling, transport and market access, and, on the other hand, the promotion of good planting material and technical advice.

2.4.2 Forests products and trade

Wood Production. With the advent of the Forest (Conservation) Act of 1980 and the National Forest Policy of 1988, the timber production role of the government-owned forest became a low priority. Logging operations in natural forests were discouraged. The resulting wood scarcity has provided an impetus for development of farm forestry, homestead forestry and agro-forestry. Currently about 50% of the wood supply in the country is produced from non-forest sources, that is, outside forest administered by SFDs. The rest of the industrial wood consumption is accounted for partly by imports and supply from public forests, mainly plantations.

India's roundwood production in 2006 was estimated to about 300 million m3, of which 225 million m3 (85 per cent) is the estimated share of fuelwood and 70-80 million m3 industrial roundwood, including poles and small lumber for rural households. Compared with 1991, roundwood production in 2001 registered an increase of about 20%. Supply from Indian natural forests (including temperate hardwood and softwood species) is about 12 million m3 (about half of it from tropical forest areas). The estimated share of industrial roundwood for industry coming from farm forestry and other trees outside forests is 31 million m3. Official imports of timber count for just over 3 million m3 in 2006, mostly in form of logs. Hence there is a gap between consumption and supply of timber of about 25 million m3 (conservatively estimated). It is possible that a considerable part of this gap is coming from unregistered sources, such as homegardens and small timber logs and poles. A major player to fill up this gap is the production of timber from Non-Forest areas, the high potential of which has not been recorded at the National level. The incidents of some theft from forest areas, tantamount to illegal felling, are not ruled out.

A considerable share of demand for industrial roundwood is coming from the pulp and paper industry. This industry mostly sources its raw material in India, not through imports of pulp. Wood (47%) and bamboo (24%) count to about 5.9 million m3 roundwood equivalent of the total production of 5.3 million metric tonnes. Eucalypts (47%), *Casuarina equisetifolia* (26%) and *Leucaena leucocephala* (20%) are the main wood species demanded. The main suppliers of the pulp and paper industry are farm forestry 28%, the open market (29%) and government sources (39%). ITC Ltd. Bhadracgalam Unit in Andra Pradesh for example obtains 83% of its wood from farm forestry, JK paper in Orissa obtains nearly 90% from farm forestry.

Structure of forest based industry. In terms of wood (and increasingly bamboo) utilisation in India, there are some 23,000 sawmills of varying sizes (mostly small and unsophisticated technically); 950 units manufacturing wood-based panel products and veneer sheets; 380 units producing pulp, paper and paperboards; 5 units for safety matches (with an unknown number of cottage scale units); plus a large number of units involved in downstream processing and recovery and further processing of residues. 70 to 90% of the plants are considered small-scale. Investment constraints include shortages of good quality material (mainly commercial logs, hence the increasing trade in imported logs from other tropical countries); transport restrictions; environmental issues; judicial decisions to close unlicensed sawmills in several States; economic liberalization and increased competition from imports Most of the production units are short of investment capital, hire unorganized and legally unprotected labour, use outdated machinery and are characterized by poor management and technical skills. In sawmills for example, only 3% of produced products meet Indian grading standards. Processing technologies in India are generally inefficient and cause a high amount of wastage. Seasoning and preservative treatment that can increase durability of solid-wood products are rarely applied, even though much research was carried out in the then advanced laboratories in the early years of the Forest Research Institute in Dehra Dun.

Timber trade. India is a net importer of forest products. In 2001, the largest share of import bill went for logs for feeding the processing units, followed by paper and paperboards. The total value of imports of primary

forest-based products in 2001 was US$ 942 million, compared to US$94 million for such exports. Logs made up about 42% of the total forest products import bill. The import volume was about 2.1 million m3 in 2004 and is projected to increase significantly to meet the growing gap between supply and demand, especially of quality tropical hardwoods. As such, 95% of all wood imports to India are logs, mainly from tropical countries. With Indonesia and Papua New Guinea no longer in the arena, Myanmar and Malaysia remain the major countries for tropical log imports. Several African and Latin American countries are joining the log and other forest product exporters to India, notably Benin, Costa Rica, Cote d' Ivoire, Ecuador, Gabon, Ghana, Nigeria, Tanzania and Togo, and even Cameroon, Guyana and Panama. Log imports are supported by a favourable tariff regime of 5% compared with 25% for imported sawnwood and 34.4% for plywood.

Fuelwood production and trade. Fuelwood collection ("headloading") is traditionally allowed and unrecorded. About 75% of all forest production is said to be fuelwood, mostly collected from natural forest. Admitted rights to fuelwood collection are (usually) for deadwood. Because the collection is often not monitored, there do not seem to be any check that green wood, including branches, are not being harvested as well. Although most of the 225 million m3 of fuelwood is consumed domestically by the forest-dependent poor, including tribal people, sale of fuelwood is also a major source of income. Since these sales will mostly be in towns, the fuelwood bundles must be passing by SFD roadside checkpoints. It is not clear why the SFDs are unable to estimate reliably the quantities of in-town fuelwood sales. A rough estimate of 50 million m3 of fuelwood traded between rural areas and urban areas could surely be improved. In urban areas, about 30 million m3 of fuelwood are used for industrial purposes, including as charcoal. Although the 1988 policy commends a shift from fuelwood to biogas, liquid petroleum gas and solar energy, these fuels are not regularly subsidized and the likelihood of adoption by subsistence-level tribal people seems low. The 1988 policy also recommends popularization of fuel-efficient Chula stoves in rural areas, but these also do not seem to be subsidized so motivation for uptake is lacking.

Non-timber forest production and trade. The production and trade in NTFPs receives attention in successive forest policy statements because NTFPs are so important in the forest-dependent rural and tribal economy. The Constitutional Amendments of 1993 provided for transfer of ownership of NTFPs from the State governments to Gram Sabhas/Panchayats (village assemblies) in States having sizeable tribal populations. Orissa has transferred all marketing responsibility in this way in 2006. The National Medicinal Plants Board was established in 2002 but does not fulfill the responsibility for developing or monitoring quality standards. This seems surprising, given the importance of plants in traditional, ayurvedic medicine and in the export trade especially to the Middle East and Europe.

Many States have specific regulations about NTFP production and trade. The prime objective of the State Minor Forest Produce (Trade and Development) Co-operative Federation Ltd. in Madhya Pradesh is to save the tribal people who are engaged in collection of minor forest products (= NTFPs) from inequitable trading with urban-based middlemen, to ensure fair wages and benefits, to rationalize marketing of products, to empower the community in managing their own affairs through appropriate institutional arrangements, and to ensure that the resources are sustainably managed. Other states, such as Andra Pradesh, have similar arrangements. However, a general complaint is that the State government officials still play an overpowering role in the decision making process and their dominance in the governing bodies makes people's participation less effective. It is unclear why the tribal collectors cannot be offered a choice of dealing with private sector traders at their own risk, or selling to the Federation. The SFD-related bodies pay about half the market price for the nationalised NTFPs but do so promptly, with the balance to follow up to a year later. Dealing directly with the private trader may win the market price but payment may be difficult to obtain and even more delayed. These federations are not cooperatives, in the sense that net profits may be shared at year-end between members, but at least some of them provide rigorous quality assurance testing, clean processing and sterile packaging. It is unclear if the activities of these federations have been studied by economists for comparison with free-market enterprises. Although some States have relaxed their nationalisation of NTFP marketing, others have not, with the SFD in Kerala retaining control over 120 NTFPs, justification for which remains unclear.

Plant-based medicines for which the knowledge is traditional and inherited in tribal communities ought to confer intellectual property rights on the producer communities. It is unclear if India has the appropriate legislation to permit the registration of such knowledge (as "prior art"), which can be used to advantage by the communities if the private sector (or government) attempts to domesticate or patent the plant genomes or their products. The situation is complicated by the long period for which the phytochemical survey of India has been running – well over a century – so the traditional knowledge may have been placed in the public

domain before intellectual property rights were deemed to be commercial for indigenous and traditional people.

Most important non-timber forest products. By far the most important NTFP in India is fodder, especially dry-season fodder. About 250 million tones green weight is harvested manually, and an unquantified amount is grazed and browsed in forest by free-range cattle. Out of the estimated 450 million cattle in the country, nearly 270 million graze in forest areas. About one third of the cut fodder requirement comes from forests. It seems surprising that the SFDs have not worked with State Livestock Departments or the Indian Grassland and Fodder Research Institute in Jhansi to improve the productivity and nutritional quality of in-forest grazing, and to develop silvo-pastoral agroforestry systems. As fodder is not recognized by the SFDs as a NTFP, there do not seem to be any estimates of how much of the 250 million tones is sold and how much is consumed by livestock in forest and forest-fringe villages.

Another important NTFPs is bamboo. For some purposes it is grouped with timber, in the Indian Forest Act 1927. Advances in the technology of bamboo processing, especially the development of bamboo mats for ply boards, should mean that there is a high-value market for household-processed mats. However, it is not clear if there are mat-pressing board factories in India, similar to those now common in China. There is a huge market for handicrafts made from bamboo, both nationally and internationally. Markets in Europe are beginning to ask for forest certification to accompany bamboo exports, for which initiatives have been taken in India but a fast speed is required to safeguard the export interests of the country.

Leaves for thatching materials and a number of food and medicinal plants are essential to meet the basic needs of local communities. Other NTFPs, such as rattan, latex, gums, resins and aroma chemicals support value-added processing, niche marketing, and export trade. NTFPs contribute over 75% of total forest export revenue in India. People living in and around forests depend on NTFPs for subsistance and supplemental income. There are more than 8000 species of medicinal plants from forests used throughout the country, by far the majority only collected from the wild, with only 20 to 25 currently in domesticated cultivation.

2.4.3 Forests for protection

Forest Protection. The major non-human threat to regeneration of natural forests, particular in semi-humid and dry tropical areas, is the high level of grazing and browsing by sheep, goats and cattle. Nearly 78% of all tropical forests are affected. Man made forest fires represent another serious problem. Nearly 50% of all forests are under increased risk of forest fire because of the drying effect on the forest floor of sunlight penetrating canopies broken excessively through careless and repeated harvesting. The immediate cause of forest fire is the accidental spread from fire used in agricultural (land clearing or land cleaning) and grazing activities and during NTFP harvests, e.g. for stimulation of bidi leave re-growth and to remove litter under *Madhuca indica* trees for collecting of flowers which are an edible delicacy. At least in Madhya Pradesh the SFD reported that in joint forest management areas (within 5 km of participating villages), the self-interest and vigilance of villagers from watch towers had reduced accidental forest fire very considerably. Prior to JFM about half of the closed-canopy forest had experienced annual ground fires and sometimes crown fires. Since the advent of JFM, accidental fires had been reduced to about 1 per cent of the closed canopy forest area annually.

As JFMCs cover only about one third of the notified forest area, there remains the hazard of fire in notified forest outside the range of JFM control. Presumably the increasing rural population and increasing degradation of the dense canopy forests are increasing the fire hazard, and this may be exacerbated by longer dry seasons through climate change. The increase in the rural road network plus the increasing sophistication of fire prediction methods (mostly developed in Australia and the USA) and the availability of real-time satellite imagery at low cost should make fire control easier and more effective, even possibly cheaper than in past years. Militating against effective fire control are the low operational budgets of SFDs and FDCs for field work. The promotion of programmes which discourage the use of fire, such as conservation farming practices and the cultivation of fodder plants, should reduce the incidence of wild fire caused accidentally by farmers.

Climate Change. Climate variability, in particular unpredictable and more irregular precipitation patterns, inundations, heat and droughts are considered as major new threats to forest and agro-ecosystems. Global warming is affecting Indian agro-ecosystems more than other regions because of India’s agricultural dependence on the monsoon regime. Changing climate will affect agricultural production and most probably increase the pressure on forests. Climate change adaptation and reducing vulnerability of forest ecosystems

will become a major management challenge in the management of rural landscape in the near future. Climate modeling suggests that some traditional cropping patterns in semi-arid areas may become infeasible because of increasing drought and unreliable rainfall; these cropping patterns may need to be replaced by robust agroforestry systems, but that change would need to be accompanied by changes in the human diet.

Soil and water conservation. The Wasteland Atlas of India (2000) classifies 20% of the total land area as so-called wastelands, including as major categories in tropical areas: (i) land with or without scrub (19.4 million ha); (ii) degraded notified forest land (14.1 million ha); (iii) siltation (5 million ha); (iv) land severely affected by shifting cultivation (3.5 million ha); (v) degraded pasture land (2.6 million ha); (vi) gullied land and (vii) land affected by salinity (each about 2 million ha). About 146 million ha are affected by gradual wind and water erosion. The looming environmental crisis was one of the main reasons for the Central government to emphasise the environmental protection and conservation roles of forest in the 1988 policy. Measures are being taken particularly to protect the upland watersheds outside the tropical belt, through forest conservation and afforestation, against increased erosion under degraded forests, sedimentation of water reservoirs, silting of irrigation canals, and flooding through too-rapid run-off.

Environmental Services. Rather little seems to have been studied recently on the quantitative importance of natural forests and plantations and trees outside forest for provision of tangible and intangible environmental services; mentioned above. These services should come into greater prominence if the MoEF and the SFDs used Total Economic Value (TEV) to demonstrate the importance of sustainable forest management. Indeed, as raising or restoring the productivity of degraded natural forest will take a relatively long time, retention of administrative control over one quarter of the land area of India by the forest services may increasingly have to be justified in terms of the environmental benefits.

Biological diversity. India is one of the 12 mega-biodiversity countries, commanding 7% of world alpha bio-diversity and supporting 16% of major forest types. A study by the UNEP World Conservation Monitoring Centre, made for FAO's global Forest Resource Assessment 2000, listed 3,008 species under seven species groups (amphibians, birds, ferns, mammals, palms, reptiles, trees) of which 494 species are endangered – and 210 of them are country-endemic endangered species. Of the country-endemic endangered species 173 are forest-occurring, 128 being tree species. The continuing forest degradation does not bode well for bio-diversity and habitat conservation. The wildlife situation of India is also discouraging, due to loss and degradation of habitat, agricultural encroachment and poaching for active foreign markets.

Extent of protected areas*:* Protected areas in India include mainly two legal land use categories, national parks and wildlife sanctuaries, most of which fall within notified forests. Amendments made in the Wildlife Protection Act in 2006 defined two new protected area categories, conservation reserves and community reserves. The FSI's State of Forest Report 2003 indicated that there are 92 national parks covering an area of 3.8 million ha and 492 wildlife reserves covering 11.5 million ha. There are 28 Tiger Reserves that fall partly in one of the legal protected area categories. Conditions of many of these protected areas are mediocre to poor. Habitat fragmentation because of fire, grazing, "unregarded" (illegal, unrecorded or unlicensed) extraction of wood and NTFPs, and inadequate habitat management is cited as the major threat to sustained wildlife and biodiversity conservation in protected areas. People-wildlife interfaces in several cases are fraught with conflicts and tension. A powerful conservation elite promotes a strict conservation approach ("parks without people") while socially orientated development agencies want to see an increased participation of local people, particularly tribal people, in protected area management and revenue sharing. A new National Wildlife Action Plan 2002-2016 was released by the Prime Minister in 2002 aiming *inter alia* at strengthening the protected area network and effective management of existing protected area. Financial allocation nevertheless remains meagre (for 2005/2006: 140 million rupees national budget allocation).

Community involvement in protected area management and benefit sharing. In forest fringes (within 5 km of notified forest boundaries) and buffer zones outside protected areas, JFM-type eco-development committees have been encouraged to share protected area management and potential benefits. Suitable habitats for wildlife and biodiversity conservation are becoming scarce outside protected areas. Mobile animals can retreat to the protected areas but may venture out into neighbouring farmlands. While park management authorities may benefit from visitor fees paid by tourists, there is as yet only meagre compensation to villagers for loss of human life and of cattle to tiger attacks. A human life is valued at Rs. 5000 (US$125) while a cow is worth Rs. 2000 (US$ 50). It is a common complaint that even these meagre compensation payments can be secured only after prolonged and persistent protest. No compensation is paid by government for losses of or damage to crops by grazing herbivores or trampling elephants. An insurance scheme for compensations against wildlife damage, similar to agricultural crop

insurance, could help to reduce tensions between villagers and park authorities and could perhaps be co-funded by visitor fees.

Wetland protection. Until 1987 there was no particular wetland protection in India. After signing the Ramsar convention, India established 2 protected areas in 1987. In 2006, there are a total of 25 fragile wetland areas under protection, covering more than 6 million ha. Community participation and sustainable fishery development are among the core activities in the protection programme. The national forest service supports through a special programme the regularisation of protected area schemes and included local communities in joint wetland management schemes.

The value of mangroves for the protection of coastal areas has been more appreciated after the devastating effects of the December 2004 tsunami. Increasingly fierce cyclones and rising sea levels, both induced by climate change, increase the protective value of mangrove coastal fringes on mud and *Casuarina* shelterbelts on coastal sandy soils. Post-tsunami relief funds are paying for restoration of degraded mangrove in Tamil Nadu and A & N Islands because natural regeneration and rehabilitation is considered to be too lengthy.

2.4.4 Socio Economic Aspects

Economic aspects. Forestry's contribution to GDP fell from about 2.9% in 1981 to 1.7% in 1991 and around 1.1% in 2005. This figure excludes the contributions of forest-based industries (which are counted under manufacturing), as well as the vast amount of products such as fuelwood and fodder, the use of which is unrecorded. The figure also ignores the contribution of environmental services such as water and soil conservation. About 7.5 million people, mostly in rural and tribal settings, are in forest-related employment.

The lack of a system of forest resource accounting is a major deficiency. Unrecorded uses of forest products cause distortion in income accounting. The SFDs earn only derisory revenue from long out-of-date taxes. Low revenue is reputedly associated with a reduced budget allocation for forestry development. The value of forest-provided benefits - including wood products, fuelwood and charcoal, non-wood construction material, forest grazing and forest fodder, food and medicinal plants - during the 1990s was estimated to be US$ 43.8 billion annually (NFAP 1999), against a reported Gross National Product share ascribed to forestry of US$ 2.9 billion in the same period

Special economic programmes in forest areas. In 2005, the Government of India launched a rural unemployment and poverty programme through a National Rural Employment Guarantee Act (NREGA). This Act ensures employment for at least 100 days to every household and will be implemented throughout all rural areas in the country, under the administration of the Rural Development Department. This programme can have beneficial aspects for rural employment, including in forest management and conservation, provided that the funds are properly managed and protected from misuse. Projects have to be implemented by the Panchayat administrations; forestry activities are eligible for funding, but it remains unpredictable if such activities will be approved by the Rural Development Department or initiated through the Panchayat. NREG is part of the "Bharat Nirman" approach to enhance livelihoods in rural areas which includes the "Backward Region Grant Fund" that is particularly implemented in the 150 districts located in forest-fringe areas.

International cooperation. International technical cooperation and financial support in the forest sector has led to certain innovative initiatives, such as the setting up of ICFRE, and has boosted social forestry and JFM for more than 20 years.. The suitability of such funding for forest development remains high, because the government budgets for forestry operations remain low and private investment in the sector is limited and often hampered by burdensome regulations. Orientating forestry towards rural employment, poverty reduction and socio-economic development merits to be supported by substantial international cooperation, especially until a natural resource economics and sector-wide approach to forestry is well entrenched and appropriately valued.

Livelihood values. About 300 million people in India live below the poverty line of US$ 1 per day. Most of them live in mountain, upland and ecologically fragile areas, and forestry is often one of the only sources of employment and income. Roughly 275 million poor rural people living in tropical areas (26% of the total population) depend on forests for at least part of their subsistence and cash income which they earn from fuelwood gathering and harvest of poles, fodder and a range of NTFPs. 70% of India's rural population depends on firewood as their main energy source, and about half of the estimated 90 million tribal people live in forest fringe areas, and tend to have close cultural and economic links to forests.

Social relations. Local rights (if admitted by SFDs during the settlement procedures for forest reservation) govern the use of forest resources by rural and tribal communities living in and around the forests. The plight of most of these communities is one of great hardship and the situation demands the settling of tenure issues and rationalization of the system of people's participation in forestry. These claims were registered and rights were adjudicated mostly at a time when India's rural population was much smaller than it is today. There should be a thorough review of the ways in which rights are considered and now used, in relation to present and predicted livelihood options. Such a review should be accompanied by a study of trends in rural demography and the implications of government policies now operating and under consideration.

Governance in the forest sector. In general, JFM illustrates the need for addressing the governance problem -including the decentralization of diverse roles and responsibilities, especially in view of the evolving cross-sectoral context of SFM. The shortage of operating funds and the associated staff makes the problem further complex. The SFDs have retained commercial interests and control over NTFP marketing long after the justification for such responsibilities had declined. The private enterprise sector has demonstrated in the second and subsequent generation of tree planting on private land that it is responsive to price signals and evidence of demand. Civil society in the forest sector is still relatively under-developed but is generally capable of taking more significant roles in policy analysis and development, and in the capacity building of forest-dependent communities. Some NGOs are also capable of objective and independent monitoring of the performance of both public and private sectors. The forest service (MoEF and SFDs) would benefit through an independent review of its roles in today's India, and how it should carry out appropriate re-structuring. This will be a major task but the longer it is postponed the more missed an opportunity it will be.

3. TECHNICAL SYNTHESIS WITH RECOMMENDATIONS

India's forestry sector is fraught with problems. Rising livelihood aspirations and needs for human development, and increasing population pressure on a decreasing resource base, make forest governance a highly difficult task. Conflicts exist in several interfaces of forestry and wildlife with community – in watershed management, plantation development, wildlife and biodiversity conservation, management of protected areas and so on. Several components of SFM are often missing – e.g., a conducive policy environment for SFM; security of the forest resource base; inventory and functional working plans, functional land capability classification, efficient utilisation of forest produce and sustained investment.

There have been some positive changes in the forestry sector during the past decade, such as: the acceptance and expansion of joint forest management, increasing involvement of farmers in growing trees outside the forest areas, partnerships of forest industries with local farmers. Converting these trends into a progressive movement for SFM, will be a challenging but not impossible task.

3.1 PARADOXES OF FORESTRY IN INDIA

Paradox 1

Notified[8] forest land under State Forest Department (SFD) administration and legal control covers almost one quarter of India's land area, but the "forestry" contribution to Gross Domestic Product (GDP) is only about 1 per cent or up to 3 per cent if primary and secondary processing is included. Either the forest is unproductive or GDP statistics as compiled does not reflect the total economic value of forests, trees and their products and services.

Comment 1.1 The SFDs readily acknowledge the gradual reduction in natural capital and the sale of forest products at or below cost price and without factoring in the full economic costs of regeneration, and the consequent low attribution of value in national accounts. The absence of forest resource accounting, and more generally of natural resources accounting, may explain why Central and State Government budget setters provide national operating budgets to SFD which are far below the needs of the policy-approved targets.

Comment 1.1 Due to non-availability of complete and accurate forestry data, various parameters for the computation of GDP remain insufficiently addressed or non-addressed, leading towards non-clear picture of forestry towards GDP.

Paradox 2

Since at least 1952, the national forest policy has aspired to a target of 33 per cent forest coverage of India's land area. This aim was reiterated in the 1988 policy statement and confirmed in the recent report of the National Forest Commission (2006). Current (2003) coverage is 20.55 per cent, or 23.68 per cent for forest and trees-outside-forests (TOFs) together. As cover is degrading in the notified forest and the target afforestation plus Joint Forest Management (JFM) rate is about 1 million ha annually over 5 years through the flagship National Afforestation Programme Scheme, the likelihood is low for reaching the 33 per cent target in the foreseeable future. Moreover, the budget resources are too small for reaching such a target (almost a 50 per cent increase in forest cover in 20 years from 1988).

Comment 2.1 It is unclear why the MoEF and SFDs have such an attachment to snapshot area statistics, instead of to statistics about trends in the resource quantities and values. Given the site sensitivity of some major timber species (for example, yields of melina and teak vary strongly with soil quality), it should be more meaningful to cast scenarios about yields and product qualities than about crude areas.

Comment 2.2 Likewise, for schemes intended at least in part to improve rural livelihoods; it is not the forest area that matters to village communities but the sustainable yield of a variety of forest products with many different values. Apart from a few research studies, there does not seem to be any use of total economic value (TEV) in forecasting future needs or in planning to satisfy them.

Comment 2.3 There have been seven or more attempts since 1950 to settle "finally" the agricultural encroachment by farmers into SFDs' notified forest land. This is a battle which cannot be "won" against expanding rural / agrarian populations. More vigorous demonstrations should be provided of growing high yield fodder and arable crops together with high-value timber trees or NTFPs in agroforestry systems in SFD-administered in-forest compartments close to forest villages, under JFM and similar arrangements. It is not clear how SFDs can justify retention of large areas of low-yielding natural forest when demand for land for more productive use is rising.

Paradox 3

How far the ban of Hon'ble Supreme Court on green felling in 1996 has helped? The Supreme Court further prescribed the harvesting through approved Working Plans only. 75 per cent of notified forest is under Forest Department working plans, but there is continuous degradation of forest cover (canopy density) even while the overall area of forest cover may be slightly increasing. Possible explanations include: (a) the working

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[8] The permanent forest estate/gazetted forest area which has been formally gazetted is known in India as the "notified" forests (which comprises reserved, protected and unclassified forests)

plans are not implemented adequately, (b) the area and cover statistics are inaccurate or not sufficiently precise to indicate trends, and (c) the forests are under unsustainable biotic pressure.

Comment 3.1 In spite of updating of some SFD Working Plan codes to accommodate the Bhopal-India (ITTO-related) criteria and indicator statistics of management, FD working plans may be over-elaborate, inappropriately rigid, and weak on the important scenario casting and yield prediction. These massive documents must be expensive to produce and revise and diverting of specialist FD capability. Many other countries have moved to slim-line computerised formats which draw on forest yield prediction models, and which permit flexibility in harvests as markets change, while respecting SFM principles.

Comment 3.2 It is unclear if and to what extent India has benefited from its long standing and proven forest management schemes, lead in tropical tree and forest growth, and yield studies which has been maintained until date. This only can improve the quality of Working Plans both for conservation and sustainable production purposes, if appropriately improved.

Comment 3.3 The statistical sampling techniques used by the Forest Survey of India (FSI) and by SFDs for remote sensing and forest inventory seem to be more appropriate to snapshot surveys than for estimates of changes and trends. The FSI reports on the State of Forests is presently not providing much information about sampling procedures.

Paradox 4

Compared with other countries, the SFDs are engaged in some activities which are not a function of a strategic, normative or regulatory government agency. While the private sector was relatively under-developed, it may have been appropriate to engage in commercial activities, this is no longer justified. In some States, Forest Development Corporations (FDCs, semi-public enterprises) have been borrowing funds at commercial interest rates up to 18 per cent, which cannot possibly be repaid from tree growth. The FDCs are receiving a hidden subsidy by being allowed to log the natural forest, possibly without carrying out silvicultural operations to assure sufficient natural regeneration. In addition, the government accounting system does not seem to credit the SFDs with wealth creation (net increase in woody biomass) or wealth maintenance (forest protection in a broad sense).

Comment 4.1 There do not seem to be exit strategies through which the public bodies in the forest sector will move out of commercial activities such as timber depot management, tree seed collection and nurseries, monopsonies on the nationalised minor forest products, afforestation plantations (including through FDCs). SFDs have developed techniques, provided pilot projects and presumably have collected detailed costings. For all major commercial activities still in State hands there should be a comparative accounting study to determine if financial savings and efficiency gains are possible through transfer to the private sector.

Comment 4.2 There seems to be surprisingly little use of economic tests, to determine where a SFD should focus its efforts.

3.2 MAJOR CONSTRAINTS AND OPPORTUNITIES

3.2.1 Among crucial constraints impeding progress towards SFM in India are**.**

(i) Under-investment in notified forests with creeping forest degradation.

(ii) Restrictions on harvesting and transporting timber and other forest products.

(iii) Continuing and rising gap between demand and supply with unrecorded removals of fuelwood, timber and other forest products.

(iv) Resource accounting does not credit contributions to the economy, such as of unrecorded removals and environmental services.

(v) Undue reliance on limited budget and external support for field programmes instead of leveraging private public panchayat partnership potential.

(vii) Limited timber market intelligence and poor state of forest data management.

3.2.2 In spite of constraints highlighted above, sustainable management of India's forests offer a number of significant opportunities:

(i) Sufficient availability of land area in total to reduce the gap between demand and supply of forest goods and services. Can draw upon employment guarantee scheme, among others, to enrich and enhance the forest estate.

(ii) JFM schemes have shown that village communities, private farmers and industrial enterprises will invest in forest regeneration and conservation if appropriate incentives and institutional mechanisms are developed.

(iii) Farm forestry and private enterprises demonstrably can promote and manage production activities without direct FD involvement. India's SMEs and private sector as a whole are flourishing.

(iv) Techniques for rational planning of forest management are well known, and are being implemented in several States. More and better awareness-raising and publicity merits to be given to the benefits of rationalised planning, research and implementation.

(vi) The silvicultural systems of forest management through working plans are well established. These can now be oriented to dovetail the requirements of SFM, taking advantage of Bhopal –India C & I process and new technologies, such as of clonal planting, GIS and remote sensing.

(vii) The high level expertise of the MoEF & SFD personnel is well acknowledged and supported by reputed national institutions. These can be buttressed to help build capacity to address the rising cross-sectoral context of pro-poor growth and sustainable resource management.

3.3 THRUST AREAS

On the basis of review, analysis and the diagnosis, some thrust areas have been identified for further strengthening of SFM in India which can go a long way if adequately addressed and financially supported.

Thrust 1: A Forest policy that marries livelihood development and forest conservation

Thrust 2: Planning for SFM: Information and data management for adequate policy decisions and practice for SFM

Thrust 3: Forest service to be properly equipped to face the challenges of SFM in a changing society

Thrust 4: Clear identification of forests to conserve, and the forests to make available for development

Thrust 5: Increase production forestry to meet demands and to come to a real multiple-use forestry both for timber & NTFPs.

Thrust 6: Address the discrepancy between wood, timber and NTFP supply and demand with accurate upto date data.

Thrust 7: Strive to secure and sustain protected areas that are increasingly under human pressure

Thrust 8: Integrate SFM in sustainable livelihoods and wider socio-economic development to evolve JFM as a SFM driver.

Thrust 9: Financing forestry and forest industry & related human resource development.

3.4 RECOMMENDATIONS

For each thrust area, the mission has classified its recommendations into three parts:
(i) National level, MOEF
(ii) State level
(iii) recommendations to ITTO

A distinction is made according to priority for (short, medium and long term).

1. ***Revise the 1988 Forest policy and related regulatory framework.*** Create a platform at multi-stakeholder level, including other public services intervening in forest-fringe areas and relevant NGO and Aid agencies to propose an integrated forest policy that considers both, the ecological security and livelihood needs of rural population as integrated paradigm. The platform should identify impediments at policy, legal and institutional level that hampers the introduction and implementation of sustainable management of the forests and tree resources. (National level with State level inputs, short term).
2. ***Forest management policy***. Clarify the productive role of natural tropical forests in the national forest policy and formulation of state-level strategic forestry programs or other similar efforts, through a participatory process, taking into consideration the whole range of economic, social and environmental values of these resources and disseminating the results to all participants and other interested parties so as to guide their future actions (Short and medium terms, national and state level).
3. ***Joint Forest Management***. Consider the problems identified in the *policies and regulations, particularly in respect to the implementation of Joint Forest Management Schemes* through decentralized governance and benefit sharing for timber and NTFP production and take appropriate actions to complete or adjust the regulatory framework, with a view to facilitating the achievement of SFM in notified forests (Medium term, national and state level).
4. ***Forest Management Plans.*** Review the Forest and Working Plan Codes in order to update them, especially in view of forest management through JFM and community participatory schemes and to promote competitiveness by taking advantage of market drivers and economies of scale, maintaining biodiversity at the landscape level, strengthening the organizational structures of village forest managers and improving the effectiveness of the potential support and incentives programmes at state and national levels, involving appropriate entities and financing mechanisms.
5. ***Private-Community Partnerships.*** Promote *agreements between JFM schemes and private companies* for the establishment of commercial plantations in degraded forest land and joint investments in forest industries based on natural forest or plantation timber (Medium and long terms, state level).
6. ***Illegal forestry activities.*** Strengthen, at state level, *programs and resources* for the control of illicit logging and other illegal activities. Establish and implement national purchasing policies for the purchase of legally sourced timber. Implement preventative audits and link them with voluntary certification where appropriate. Improve the transparency and knowledge on illegal logging through specific studies and public communication (Short term, in forest rich states).
7. ***Capacity building in SFM.*** Increase the number of *training programs* for two priority groups: (i) forest communities implementing JFM schemes, and (ii) technical service providers, including in particular forest researchers, the preparation of training and outreach materials, to be widely distributed and designed for different groups of potential beneficiaries (Short and medium terms).
8. ***Funding SFM.*** Establish a national think thank and communication group that assesses the real value of forests in order to considerably increase public and private funding for the recapitalization of forest resources and sustainable forest management (mid-term).

Specific programs to support sustainable forest management

9. Joint forest management concepts and training in forest restoration and forest land rehabilitation as well as in natural forest management areas.
10. Improvement of analytical capacities for monitoring, data and information management.

11. Pilot projects of community based SFM in teak forests linked with certification (in one or two selected states with adequate natural forest management resources.
12. Securing forest boundaries through a national programme reconciling the difference in records of revenue and forest departments to ensure permanent forest estate which is the key requirement for SFM.

Industrial and marketing development

13. Promote the improved utilization, valorization and marketing of *non-timber* forest products.
14. Promote the modernization of secondary wood processing industry and reduction of waste.
15. Establish a *computerized information system* with updated data on forest *product markets* (timber and NTFPs) accessible to producers and buyers of forest products.

Research

16. Action, policy and market research involving partnerships with centres of excellence.

3.5 ELEMENTS FOR ITTO SUPPORT PROGRAMMES FOR INDIA

In view of the needs identified in the diagnosis and the comparative advantages of the Organization, the mission suggests the following activities and thematic areas as elements for a medium to long term ITTO involvement in India:

1. Establishment of a National Forestry Policy Analysis Facility for speedy implementation of SFM and related review of the1988 Forest Policy
2. Support the development of Forest Certification Mechanism for timber and NTFPs
3. Institutionalization of Criteria and Indicators for Sustainable Forest Management (SFM)
4. Support for strengthening of Research and Development to increase forest productivity
5. Development of timber market intelligence, data collection and the organization of stakeholders, e.g., producers, retailers, consumers, traders and technical service providers
6. Development of forestry database management system
7. Support for promoting Public-Private-Panchayat Partnership (PPPP) for sustainable forestry
8. Development of Integrated Forest Fire Management Mechanism in the country
9. Support for promoting high-tech/Clonal plantations and the conservation and management of mangroves and bamboo resource
10. Establishment of facility for research and development of Non-Timber Forest Products to address the issues of pro-poor growth and gainful employment
11. Training and Human Resource Development for implementation of holistic SFM
12. Capacity building for Regulating Timber Trade
13. Promotion of traditional knowledge to provide livelihood opportunities to the tribals and establishment of forest extension centres
14. Support for modernizing and strengthening the forest based industry and value addition

15. Development of community based Sustainable Forest Management model for timber and NTFPs

16. Development of monitoring system for Sustainable Forest Management and the removal of impediments

18. Support for bio-diversity research and conservation systems

19. Innovative approaches to the rehabilitation of degraded forests and waste lands

20. Support for strengthening VSS institutions

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"An poshi teli, yeli poshi van!

Food lasts if forests last!

Sheikh Nu-u-Din, Indian Sufi Saint"