

EXPLORING OPTIONS FOR JOINT FOREST MANAGEMENT IN INDIA



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Preface

There has been a paradigm shift in natural resource management in the late 1980s all over the world and India in particular, by refocusing of management decisions to a more decentralized level of governance and public involvement in these management decisions. Such moves toward a participatory and community-based approach have to be viewed as against the traditional top-down models of policymaking that historically have been prevalent since the introduction of scientific forest management in the country.

In the above context, the present study aims to develop viable options for conservation and sustainable management of forest resources. The study tests the hypothesis that: “the current Joint Forest Management system in India is only half a step towards the sustainable development of the community living in the forested regions. A complete step would have to combine forest management objectives with sustainable rural livelihood (including enterprise development and capacity building) to achieve the goals of Sustainable Forest Management.”

The criteria and indicators of sustainability used in the study were: social, ecological and economic. The need for re-orientation of forest policy and administrative system to get with the process of decentralization of governance is also addressed.

The methodology, especially the use of remote sensing, GIS and field inventory in the context of social studies, is an important scientific contribution to the monitoring of the forest cover and livelihood studies at a village level. By virtue of statistical soundness, the use of remote sensing and GIS techniques, the project has provided convincing results and found ready acceptance by the Government / Policy Makers and the State Forest Department.

The forest areas under study are among the few remaining examples of natural forests in the country. The project findings will directly contribute to the conservation of these remaining natural forests, containing a variety of unique flora and fauna, and alleviation of extreme poverty in the forested regions. We hope that they would constitute a basis for initiating a dialogue with the Government and Policy Makers to reform forestry institutions for promoting forest conservation as well as expanding sustainable livelihood opportunities for the extremely poor forest dwellers.

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Acronyms

AP	Andhra Pradesh
APFD	Andhra Pradesh Forest Department
APFP	Andhra Pradesh Forest Project
APFC	Andhra Pradesh Forest Corporation
CFM	Community Forest Management
CCF	Chief Conservator of Forests
DCF	Deputy Conservator of Forests
DFO	Divisional Forest Officer
DBH	Diameters at Breast Height
ENVID	Environmental Science Department of Andhra University at Visakhapatnam
FAO	Food and Agriculture Organization of the United Nations
FPC	Forest Protection Committee
GIS	Geographical Information System
GOI	Government of India
GCC	Girijan Co-operative Corporation (Andhra Pradesh)
ITDA	Integrated Tribal Development Agency
IGF	Inspector General of Forests
JFM	Joint Forest Management
NGO	Non-Governmental Organization
NWFP	Non-Wood Forest Product
NABARD	National Bank for Agricultural and Rural Development
NTFP	Non-Timber Forest Products (previously known as MFP or Minor Forest Products); also known as Non-Wood Forest Products
PCCF	Principal Chief Conservator of Forests (the highest-ranked forester in a state)
PESA	Panchayats (Extension to Scheduled Areas) Act, 1996
PPS	Probability Proportional to Size
RS	Remote Sensing
SC	Schedule Caste
ST	Schedule Tribe
SFM	State Forest Management
SKL	Srikakulam

VTDA	Village Tribal Development Agency
VFC	Village Forest Committee
VSS	Van Suraksha Samiti (Forest Protection Committee)
VFPMC	Village Forest Protection and Management Committee
VSP	Visakhpatanam
VZM	Vizianagaram
VASU	Government supported funding programme other than W.B
WB	World Bank
WFP	World Food Programme.

Executive Summary

The study was designed in the context of sustainable development in the Central Tribal Zone of India, which has nearly 40 percent of the forest area of the country and is inhabited by nearly 90 percent of the country's total tribal population. The long-term objectives were to improve the lot of the forest-dwellers, living in conditions of abject poverty, and, of course, conserve biological diversity of the region. The immediate objectives were to study the strengths and weaknesses of alternative forms of forest management systems from technical, ecological, social, economic and capacity building perspectives. The study also investigated organizational and institutional mechanism to make forestry an effective instrument for sustainable rural livelihood.

The following three forest management options were examined that were implemented in varying political, economic and social settings:

- (i) State Forest Management (SFM) on an All India basis
- (ii) Joint Forest Management (JFM) in Andhra Pradesh and
- (iii) Community Forest Management (CFM) in Orissa

The first two options SFM and JFM were evaluated on the basis of existing data and reports. For CFM, however, besides the use of existing data, sample surveys, multi-date remote sensing and GIS were used to assess the statistical and spatial attributes of the systems. The methodology developed to monitor change at the village level is the unique contribution of the study/project.

The State Forest Management had its origin in colonial times, when the production of high value timber on a sustainable basis was the dominant objective with limited concern for the social functions of forests. While the system worked during the colonial times, it broke down during the post-colonial period as acknowledged by the National Forest Policy 1988: "forests in the country suffered serious depletion arising from ever-increasing demand for fuel wood, fodder and timber; inadequacy of protection measures; diversion of forest lands to non-forest uses without ensuring compensatory afforestation and essential environmental safeguards; and the tendency to look upon forests as revenue earning resource." This retrospection gave birth to a more participatory form of forestry called joint forest management in 1992. The JFM in Andhra Pradesh has grown rapidly during the last decade, from a mere 200 to a high figure of 6,706 Forest Protection Committees. A major criticism of JFM has been that it is project based and therefore its successful implementation depends upon the funding and attitude of the agents implementing it (i.e., the concerned officer). This is the reason why JFM in Andhra Pradesh was very active, with financial support from the World Bank combined with a team of enthusiastic officers; whereas Orissa, Forest Department could not implement JFM in a big way due to scarcity of financial resources.

As there was a dearth of reliable data on CFM in Orissa, the present study used a statistically designed sample survey coupled with remote sensing to obtain reliable statistics on the extent and characteristics of CFM. Compared to JFM, which involves governmental initiatives, CFM is born out of self-realization of the communities. Under this regime, protection and regeneration of forest of varying sizes are organized

through formal/semi-formal village level institutions. For such purposes, the community does not require any financial/technical assistance from external sources except of raising awareness in some cases, where Forest Department (FD) and NGO's role serve as a catalyst or sources of inspiration. In some parts of the State, the CFM has evolved from a single village level institution to a federation of villages.

Further, study investigated possibilities to enhance forest sector support to tribal livelihood. From the comparative study in three districts of Orissa, it was found that the complete potential of forestry towards poverty alleviation (and human development) has yet to be realized by the communities themselves and the Government. It is in this context, the study recommends a new paradigm for the forest based sustainable development, which should ideally include the following components:

- (i) Local empowerment and institution building: Where the community assumes the central role in steering all of the developmental processes, and government provides support services;
- (ii) Establishment of legal, regulatory, conflict resolution and enforcement structures for the management of forest and common land resources: Mechanism to redirect a part of the revenue to the local community from the management of forests and to compensate them for the loss of revenue due to the closure of area for regeneration or other technical reasons;
- (iii) Organization of science, information, technology and extension (SITE) services: This is mainly to support planning, monitoring and evaluation of forestry development and poverty alleviation programs. There has to be periodic reporting on the state of poverty, progress achieved and constraints in the way;
- (iv) Marketing, processing and value addition: In case of NTFPs, there is market failure as well as institutional failure. There are possibilities for private-public-partnership (PPP) in cultivation, processing, value addition and marketing of timber as well as non-timber forest products.

Chapter 1

OPTIONS FOR FOREST MANAGEMENT

1.1 Introduction

The new forest policy of 1988 emphasized to increase the stake and involvement of people in overall management of forest resources. As an outcome of that, there have been systematic efforts by the Government to involve people in the planning and implementation of the forestry activities under the Joint Forest Management (JFM) programme. Independent of this, the communities in Orissa had evolved their local institutions at the village level to manage the forest. These institutions were created out of their own realization for the need to protect forest resources towards their long-term sustenance.

It is in this backdrop, the study aims to describe and evaluate the performance of the following three forest management options evolved in different political, economic and social situations:

- State Forest Management (SFM);
- Joint Forest Management (JFM); and
- Community Forest Management (CFM).

The study also investigated organizational and institutional imperatives to make forestry an effective instrument for sustainable development and livelihood support in the forest fringe villages.

We present the first option using two examples viz. the forest management system developed during the colonial period in India (1862-1946) and after Independence (1947-90). The second option is described based on joint forest management experience in Andhra Pradesh during 1990-2000. It may be noted that JFM started as follow up to the new National Forest Policy, 1988. It is still in the process of evolution and the division of responsibility (or space!) between the partners viz. the State and Community is yet to become very clear (Figure 1.1). Finally, the third option viz. CFM is discussed based on experience in Orissa, where it is reported to have existed since 1940 (Singh, 2001).

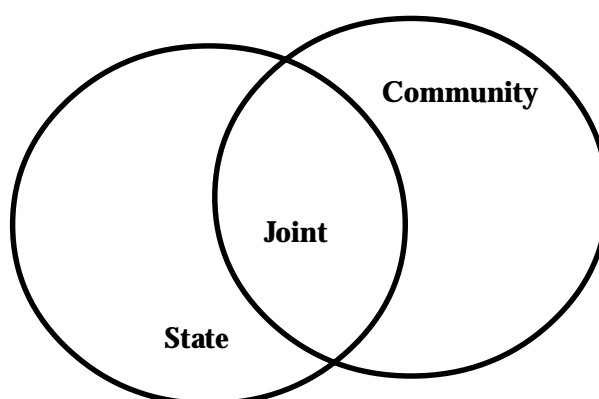


Figure 1.1: Pictorial representation of different options of forest management.

The idea is not to criticize or recommend a particular system or parties involved, but to assess how effective they are in maintaining the integrity of forest ecosystem and contributing to the socio-economic development of the communities dependent on forests. The discussion, it is hoped, will help in guiding the choice of the appropriate option in varying forest management situations or improving an on-going system of forest management.

1.2 Terms and concepts

The term “state” refers to the political organization of a society or country. It is used in two different senses, one more specific, meaning the institutions of the government; and the other general, meaning the whole body of persons who are politically organized (Encyclopaedia Britannica, 1980). The state during the colonial period was answerable to the British Parliament (Keay, 2000). The natives were excluded from the Government Process. Brandis (1897) writes: “to establish a Forest School to give training to Native Forest Rangers (not to think of professionals!) was a Utopian beginning.... At last in 1878, at the end of a long and severe fight I carried my point with the assistance of several members of the government of India, who had confidence in my judgment.” In fact, the move to open the door to the “Natives” in the British Administration was guided not from altruistic considerations, but more from a conviction that a “more extended employment of Natives in responsible positions in the public services would secure the maintenance of British Rule in India.” The objectives of education to Natives, according to Thomas Macaulay in 1830s, were “to create a class of persons Indian in colour and blood, but English in tastes, opinions, morals and intellect, who may be interpreters between us and the millions we govern” (Keay, 2000).

With the Independence and adoption of a democratic form of government, the role of people underwent a complete reversal from ruled to rulers (the term democracy is of Greek origin meaning “rule by people”). In practice, however, the government apparatus continued to function on old lines. Forests continued to be managed and “people” excluded from forests as before. It was only in early 1990s, that the government realized that forests could not be protected without the people’s participation, and consequently JFM was launched.

It may be noted that people’s rule in democracy could find expression in one or more of the following forms (Encyclopaedia Britannica, 1980):

- Direct democracy as in Greek City Republics or Village Councils, where people directly take over the management and control of city or villages;
- Representative democracy, where people elect representatives who make decisions and arrange implementation through government institutions on their behalf; and
- Constitutional democracy, where people frame rules and laws, in particular, to safe guard interests of minorities and religious groups or environment; and agree to abide by them.

The Panchayat Raj Act and its extension to Scheduled Tribe Areas (in brief PESA 1996) constitute important landmarks in the progress of democracy in the country. Under the latter Act, “every Gram Sabha (Village Council) shall be competent to safeguard and preserve the traditions and customs of the people, their cultural identity, community resources and the customary mode of dispute resolution”.

It seems, traditional knowledge of protecting and managing forests existed - and still exists in some parts of the country for long, a fact not known to many. The present study recognizes and make an in depth study of this knowledge. It is hoped that the lessons learnt would be useful in realizing the twin goals of sustainable forest management and all round community development, the dream of “village republics” by the Father of the Nation (Gandhi 1966: The Village Reconstruction).

1.3 Design of the study

A review will be made, to begin with, of the three forms of forest management viz. SFM, JFM and CFM. The descriptive features used in each case will be:

- ❖ Key characteristics
- ❖ Management objectives
- ❖ Enabling environment (policy, legislation, etc.)
- ❖ Planning and control
- ❖ Management impact.

The options of forest management will be studied with focus on the tribal regions of Andhra Pradesh (on JFM) and Orissa (for CFM). For the tribal people, land and forests are the main source for survival and development. The role of NTFP and potentials of forest-based development will have special attention. A synthesis of findings is made in Part V and a new Forest Management Paradigm is recommended with a view to meet the emerging needs of the country in respect of ecological, economic and social functions of forests.

Chapter 2

STATE FOREST MANAGEMENT

2.1 Introduction

This Section is divided into two parts: the first, 1862-1946, that covers the history of forests and forestry in the colonial period; and the second, 1947-1990, that covers the events after the Independence and enactment of the new National Forest Policy (1988) which opened the door for people's involvement in forestry.

2.2. The colonial period (1862-1946)

Objectives

Forests were managed primarily to satisfy the demands of the Crown for high value timber like Teak, Rosewood and Sal, and providing a steady flow of revenue to the exchequer. People's rights to forest produce and access to forestlands were denied and strictly controlled.

Enabling environment

The Indian Forest Act 1878, followed by Indian Forest Act 1928, helped to bring the best forestlands throughout country under the State control in form of "reserved forests". Forests were demarcated, surveyed, mapped and made inaccessible to "people" by law and force. A National Forest Policy was formulated (1894) to guide technical management of forests, and a forest cadre of trained forest officers recruited to protect and manage forests.

Planning and control system

A network of forest divisions for management and administration was created and a standard system of planning and control introduced (working plans). Research, extension and training services were introduced to maintain and improve the quality of forest management and ensure sustainable supply of goods and services. These measures took a very good care of the technical aspects of forestry.

The State provided strong administrative and financial support to the Forest Department to prepare and implement working plans, maintain network of roads and rest houses and maintain technical and administrative staff and apprehend trespassing of the forest estate. The political interferences in the personnel and technical managements were minimal. The Divisional Forest Officers and Range Officers enjoyed high degree of independence in making and implementing technical decisions.

Management impact

Compared to the highly degraded forest condition, when forest management was started in 1862, the condition of the reserved forests improved significantly with time. By 1920, an area of 32 million ha was mapped, inventoried, managed and harvested following strict principles of forestry. A moratorium on felling and control on fire and grazing was introduced. The exceptions were the World War periods, when removals were more than the sustained yield, but forests could withstand the shock, thanks to their good stocking and regeneration.

A distinction needs to be made between forestry developments inside the reserved forests and those outside. There was a relative lack of technical support or extension services to forestry outside the reserved

forests, even though, both were important. The contrasting development in the two domains viz. in and outside forest reserves is very striking. Whereas the forests inside the reserves developed, those outside the reserves declined and continuously became degraded. By 1947, when the country won freedom, most of the latter forests had disappeared or were left in a heavily degraded form. They were subsequently absorbed as reserved or protected forests or converted to other land uses.

2.3. Post colonial period (1947-1990)

Key characteristics

Essentially, the broad contours of forest management system before and after Independence are very comparable. As the people gradually took roots in a democratic system, the use of colonial planning and control system proved inappropriate as will be described in this section.

Objectives

The National Forest Policy, 1952, emphasized on a balanced and complementary forest land use according to land suitability, increased supply of fodder and small wood to the people, sustained supply of industrial timber and other forest produce and maximum revenue in perpetuity while fulfilling the above goals. It also gave higher priority to meeting of national demand over satisfaction of local needs and to conversion of low valued miscellaneous forests into high value plantations. The policy, however, did not envisage the people's role in forest management. Forest systems continued to function administratively and technically on the model of colonial times.

Enabling conditions

The major landmarks during the period were: The Zamindari Abolition Act 1952, National Commission on Agriculture 1976, Forest Conservation Act 1980 and National Forest Policy 1988.

The Zamindari Abolition Act 1952, abolished the property rights of princes and landlords. Their forests were annexed and declared as the State property. This resulted in an expansion of forest area under state control from 26 to 54 million ha by 1950, almost twice the figure for the year 1946. The gain was, however, accompanied by unprecedented deforestation and forest degradation engineered by the parties affected.

The All India Forest Service was revived in 1966, known formerly as the Imperial Forest Service. This was intended to give forestry a national outlook and make it comparable in prestige to Administrative and Police Services (known formerly as Imperial Civil Service and Imperial Police Service).

Around 1976, the National Commission on Agriculture was constituted, which made a detailed review of the forestry sector and made proposals for a change over from what it called "low yielding and low investment to high yielding high investment forestry" and recommended a three-pronged forestry strategy including "industrial", "environmental" and "social" forestry. The Commission also recommended the creation of Forest Development Corporations, which could draw upon institutional finances and thus solve the funding constraints to the forestry sector, undertake departmental logging, raise high value industrial plantations; and raise Social Forestry Plantations to solve fuel wood and fodder problems in the country side.

The Indian Forest Conservation Act 1980 was enacted to control indiscriminate diversion of forestland for non-forestry purposes. The Act made it compulsory for States to obtain the approval of the Central Government before making any transfer of forestland to non-forestry uses, and made it mandatory to undertake compensatory plantations equal to double the area on degraded forest lands.

Planning and control

With Independence in 1947, the Indian foresters took over the charge of forestry in the country, little realizing the impact of political changes after Independence, in particular, that forestry cannot be treated in isolation from the people. A beautiful and sanguine picture of the national forestry scene is presented in two commemorative volumes of “Hundred Years of Indian Forestry 1862-1962”. It must be said that the forest service did try its best to uphold the old traditions of forest management. But, it could not stop/slow down the process of deforestation and forest degradation arising from the forces beyond the control of foresters. The environment, in which the foresters functioned, had drastically changed as described below.

Loss of authority over forests: This process came in the wake of independence. The colonial force and the fear upholding the sanctity of reserved forests disappeared. A conflict arose between the management of forests through the strict guidelines of sustained yield, as in the British period, and unauthorized cuttings by the local people to satisfy their immediate needs of fuel wood and grazing. Many policy decisions started to be made by politicians often without consulting foresters. The ban on logging, unlimited small wood removals and lifting of grazing restrictions in forests are examples of the decisions, which were taken without examining their technical consequences.

Breakdown of the forestry planning and control system: The working plan system constituted the main instrument of forest management planning and control till the end of 1960s. However, it does not work any more due to several reasons such as: i) mismatch between national development planning cycle of five years compared to working plan cycle of 10-15 years; ii) logging ban in the major part of natural forests; iii) illegal removals and excessive grazing not accounted for in working plans; and iv) cost of working plans: plans are expensive, voluminous and too time-consuming to prepare and have very little contribution to make.

Fast rotation in forestry posts: There is a fast turnover of officers in a given post, whether territorial or functional. A special problem lies with the highest ranking posts of Principle Chief Conservator of Forests (PCCF) in the States and Director General of Forests (DG) in the Government of India which are affected by the fast turnover due to the seniority and political interventions. For example, there were more than 15 changes for the post of IGF during 1978-98. In case of a particular State, there were four changes for the post of PCCF in five years.

Fragmentation of authority: Due to incremental and ad hoc expansions in the Service, lines of authority have sprung who work parallel in the same area unit (territorial and functional units). Within the same forest divisions, many operations may be implemented independently by Forest Corporation, Wildlife Conservation, and Soil and Water Conservation units. This gives rise to duplication, conflict, confusion and the waste of human and material resources.

Growing lack of specialization in the forest services: The Indian Forest Academy, the main source of forestry education of IFS, is essentially a training institution. There is a complete or relative lack of specialist education (post-doctoral or even Master’s Degree) among All-India and other Forest Services in the country. The forest services consist essentially of generalist foresters, who consider posting to a territorial unit as a reward and posting to a functional unit (with a specialized job) as punishment. There is no effective system of continuing education or professional development for All-India and State Forest Service Officers.

Lack of integration between the forestry and other sectors of the national economy: There is a general lack of integration between forestry plans and those of other sectors at the state, district and local levels. This is mainly due to the mismatch between the working plan cycle and the district development planning cycle. The two streams of planning do not integrate at all.

Management impact

Forests during the World War II (1942-46) and in the recent past (1946-90) have been subject to use and abuse much beyond their carrying capacity. The demographic changes, no doubt, are the main contributing factor. By the year 2000, the population was 2.5 times that of 1950 and about four times compared to 1901, whereas the forest area has decreased by 20% from 1950 and by 60% from the 1900 level.

The loss would have been more dramatic, but thanks to the control exercised by a committed Forest Service, which in the course of time became a target of public anger and victim of unscrupulous poachers and timber smugglers. The situation, in terms of degradation may be comparable to that in 1860 when the British forestry made a start. The situation could be assessed from the following statistics mostly based on published reports of Forest Survey of India.

Firewood and timber removals: The size of fuel wood collection is far exceeding the forest production capacity. Fuel wood surveys of the Forest Survey of India (FSI, 1996) reveal that in few States the unrecorded removals from the forests exceed by 17 to 20 times the recorded production. The Figure 2.1 shows the total wood consumption and recorded production from forests during the period 1953-54 to 1975-76.

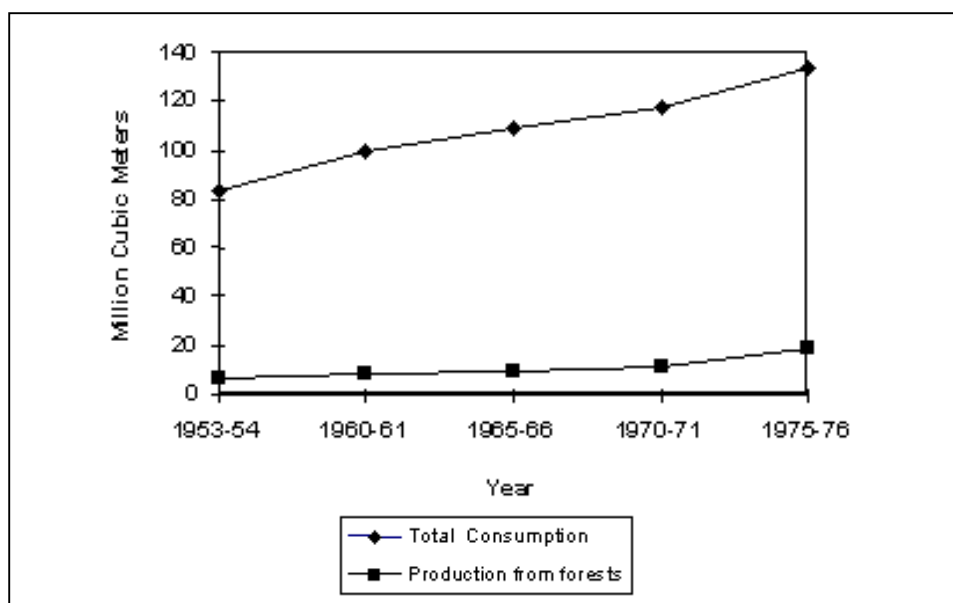


Figure 2.1: Total wood consumption and production from forests

Source: Singh and Marzoli (1996)

Forest grazing: In 1990, the grazing was estimated at 100 million cow-units against 35 millions in 1957-58. The current grazing pressure on forestland is estimated to be more than three times the carrying capacity.

Forest fires: The forest areas affected by fire in 1991 (as % of total forest cover) reported by FSI were: 51 per cent in Assam and Gujarat, 67 per cent in Bihar, 60 per cent in HP, 46 per cent in Jammu and Kashmir, 45 per cent in Karnataka, 76 per cent in Madhya Pradesh, 99 per cent in Manipur, 94

per cent in Meghalaya, 87 per cent in Nagaland, 94 per cent in Orissa, 37 per cent in Sikkim, 58 per cent in Uttar Pradesh and 33 per cent in West Bengal.

Forest regeneration: Uncontrolled cutting for fuel-wood, grazing and trampling of forest floor by animals coupled with fires are adversely affecting the capacity of forests to regenerate. As the small size trees are preferred, there is systematic destroying the regeneration of forest. A survey conducted by FSI, around 1990, reveals that regeneration is either absent or inadequate in more than 50% of the forests. This indeed constitutes a serious threat to the very survival of the forests of the country!

2.4. Deforestation

Past Trends and the Current Status:

Bastar district

Remote sensing images from the archive of Pre-investment Survey of Forest Resources (later changed to Forest Survey of India) were used to carry out an interesting study of land use and forest changes in the Bastar District of Madhya Pradesh, adjoining Andhra Pradesh and Orissa. The results are presented in Table 2.1.

Table 2.1: Forest cover changes during the colonial period and after independence at replicated sites in Bastar, India.

Variable	Location A		Location B	
	(000 ha)	%	(000 ha)	%
Geographic area	4375	100	5835	100
Forest in 1932	2731	62.4	3633	62.4
Forest in 1957	2457	56.2	-	-
Forest in 1967	2084	47.6	2635	45.2

Source: Pre-investment Survey of Forest Resources, Archives of Aerial (1967)

The average annual rate of loss at a compound rate is 0.8% at the site A and 0.9% at the site B. What is most striking is the change in the rate during the two periods: the loss of forest area at the site A during 1957-67 (ten years) was 8.5%, while that during 1932-57 (25 years) was 6.3% of the land area.

Godavari catchment

Using satellite remote sensing data of 1973, 1977 and 1994, Andhra Pradesh Forest Department in cooperation with FAO CCB Project made a study on deforestation trends in the forested part of the Godavari River Watershed in Andhra Pradesh. Table 2.2 and Figure 2.2 show the path of forest change:

The study shows that the annual rate of deforestation in East Godavari District (period 1973-1995) was 0.5 per cent against the 0.8 percent of the entire catchments area (see Table 2.3). In fact, the area outside East Godavari District showed a deforestation rate double than that of the district (1 per cent per year). The forest in East Godavari, which forms a rather compact block, appears to be better protected than in the adjoining areas, especially in Vishakhapatnam District, where it is more fragmented and intimately mixed with agricultural land uses (permanent and/or shifting cultivation).

Table 2.2: Area transition matrix for the period 1973-1995 Godavari Catchment

Land Cover Classes in 1973	Land Cover Classes in 1995 (thousand hectares)									TOTAL '000 ha	1973 %
	Closed Forest	Open Forest	Long Fallow	Fragmented Forest	Shrubs	Short Fallow	Other Land Cover	Water	Plantations		
Closed Forest	456.7	13.3	4.6	1.2	2.9	32.3	43.9	0.8	2.9	558.6	27.8
Open Forest	1.7	45.5			1.2	6.6	7.0			62.1	3.1
Long Fallow	4.6		8.3		0.8	12.4	1.2		0.4	27.7	1.4
Fragmented Forest				5.4		0.8			6.2	0.3	
Shrubs					66.3		5.8			72.0	3.6
Short Fallow	0.4				0.4	53.4	4.1			58.4	2.9
Other Land Cover		0.8			0.4		1211.2	7.0	0.8	1220.3	60.6
Water							1.2	311.4		312.6	
Plantation							0.4		5.4	5.8	0.3
TOTAL '000 ha	463.3	59.6	12.8	6.6	72.0	104.8	1275.8	319.2	9.5	2323.8	
1995 %	23.0	3.0	0.6	0.3	3.6	5.2	63.4		0.5		100

Source: FAO (1997)

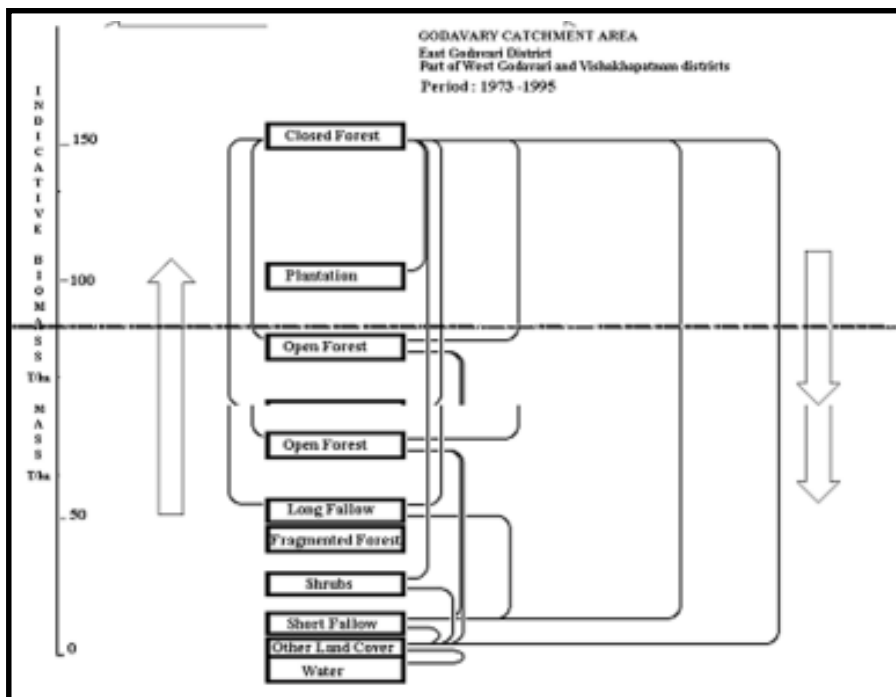


Figure 2.2: Land use transition 1973 – 1995 in East Godavari Catchment, AP

Source: FAO (1997)

Table 2.3: Change assessment for the period January 1973 - January 1995

Change Category	East Godavari Catchment		East Godavari District	
	Annual '000 ha	Simple annual Rate (%)	Annual '000 ha	Simple annual Rate (%)
Gross Deforestation	5.2	0.8	1.4	0.5
Net Deforestation	5.1	0.8	1.3	0.5
Net Degradation of Natural Forest	0.5	0.1	0.4	0.1

Source: FAO (1997)

The path of land use change

From a comparison of the 1973 with 1995 images, comprising East Godavari and parts of Vishakhapatnam and West Godavari districts, the following conclusions could be drawn:

The most common transition observed in the East Godavari District is:

closed forest ⇒ short fallow followed by closed forest ⇒ other land cover (permanent agriculture)

This sequence for the catchment area is:

closed forest ⇒ other land cover (permanent agriculture)

Thus, permanent agriculture is the main cause of forest loss.

In East Godavari District, shifting cultivation, both in the form of short and long fallow, appears to be the main agent of forest cover change. There appears to be a process of depletion of the closed forest showing the following sequence:

**closed forest ⇒ long fallow ⇒ closed forest, and
closed forest ⇒ long fallow ⇒ short fallow ⇒ other land cover,**

(Where long fallow represents a temporary, intermediate stage of degradation).

Due to the long period of time covered (22 years) the end stages (short fallow and other land cover) are far more represented.

Some other general remarks

The transition closed forest ⇒ open forest (i.e., forest degradation) is the most common change, which is resulting from felling of individual forest trees for fuel wood and/or timber. Looking at the interpretation

overlays, one can see that the changes are not homogeneously distributed. The forests of Vishakhapatnam, for instance, have been cleared and degraded at rates far higher than the other forest areas; in fact, the scarce forest resources of Vishakhapatnam are surrounded by rural populations, from the hills to the north and the coastal lowlands to the south, demanding land for cultivation, construction material and fuelwood.

Modelling of all India deforestation and forest degradation: Deforestation became quite widespread in the country after independence as shown by the study carried out by the National Remote Sensing Agency in 1980, which brought out for the first time the grave forestry situation and led to biennial State of Forest Reports by the Forest Survey of India.

FAO, in the framework of Global Forest Resources Assessment 1990, made a study of the historic loss in the natural forest cover of the country (excluding plantations and area under shifting cultivation). The study indicated a decrease from 27.2 % in 1901 to 15.8 % by 1990. If the trends continue, the natural forest area by the year 2050 is expected to further decrease to a level of 12% (Figure 2.3).

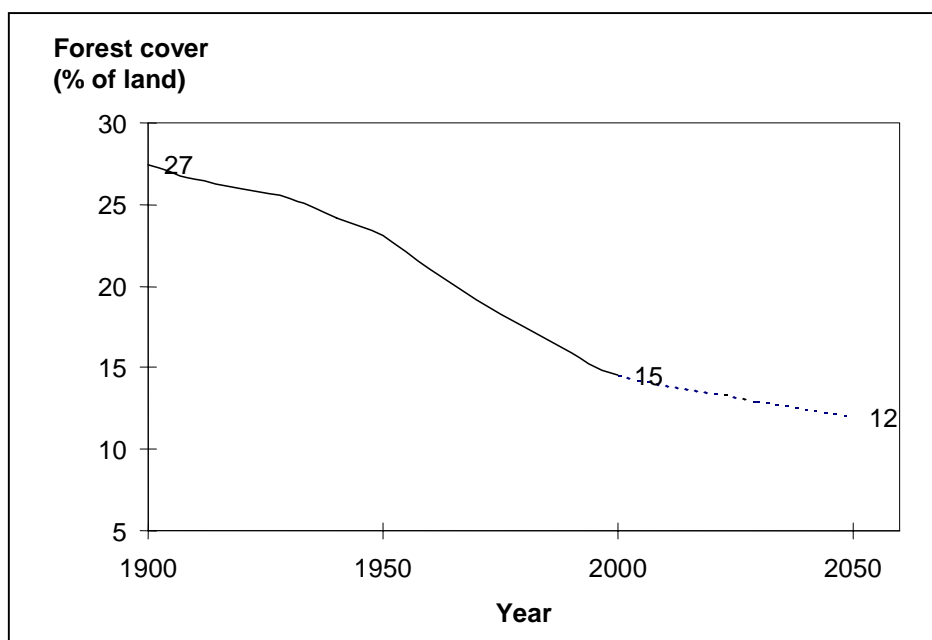


Figure 2.3: India - Natural forest cover (>10%) for 1900-2000
Source: Singh and Marzoli (1996)

The current stocking is less than half of the potential (see figure 2.4). The reasons for very low productivity of the forests are uncontrolled grazing and continuous removal of biomass throughout the year from these areas. The decreasing and sparse vegetal cover leads to severe soil erosion and land degradation and to a steep fall in productivity. It is possible to achieve a much higher productivity of the forests by effective protection and appropriate silvicultural operations. Reasons for very low productivity of the forests are uncontrolled grazing and continuous removal of biomass year after year.

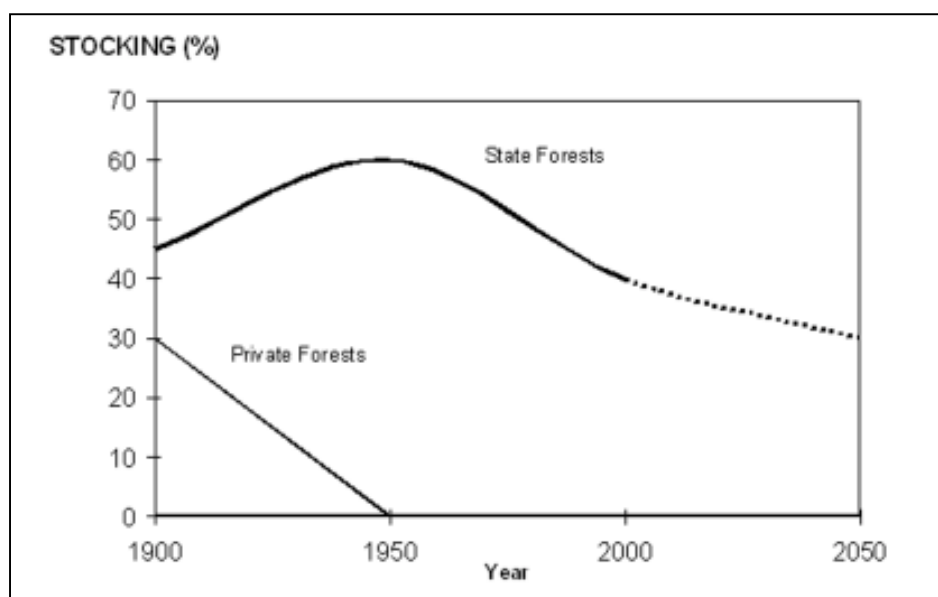


Figure 2.4: Average stocking (%) of India's natural forests (1900-2050)

Source: Singh and Marzoli (1996)

2.5. Conclusion

As expected, the state of forests by end 1980 started causing growing public concern. The introductory paragraph of the National Forest Policy 1988 sums up well the forestry situation by the end of 1990: "Over the years, forests in the country have suffered serious depletion. This is attributable to relentless pressures arising from ever-increasing demand for fuel wood, fodder and timber; inadequacy of protection measures; diversion of forest lands to non-forest uses without ensuring compensatory afforestation and essential environmental safeguards; and the tendency to look upon forests as revenue earning resource. The need to review the situation and to evolve, for the future, a new strategy of forest conservation has become imperative. Conservation includes preservation, maintenance, sustainable utilization, restoration, and enhancement of the natural environment. It has thus become necessary to review and revise the National Forest Policy." With the new Policy, a new Chapter begins in State control of forests popularly called Joint Forest Management.

Chapter 3

JOINT FOREST MANAGEMENT (JFM)

3.1. Introduction

Joint Forest Management could be described as management of the state forestlands jointly by the state and the local community with joint sharing of benefits. The program has its origin in the National Forest Policy (1988), which envisaged “creating a massive people’s movement with the involvement of the woman, for achieving the objectives and to minimize pressure on existing (reserved) forest”. Pursuant to the policy declaration, the Government of India issued a notification in June 1990 to all the States providing broad guidelines for involvement of village communities and voluntary agencies in the protection of State forests and usufruct rights of the community over forest produce (including non-timber, grass, firewood and timber products), share in final harvest of timber; and preparation of micro-plan for the forest.

During the last ten years, the JFM movement has witnessed a phenomenal growth. Twenty two States have undertaken concrete measures to create local institutions for protection and forest management, known by different names in different states, like Forest Protection Committee (FPC), Village Forest Committee (VFC), Van Samrakshan Samiti (VSS), Village Forest Protection Management Committee (VFPMC) etc. The nature of usufruct sharing also varies from state to state. In constitution of committees, representation of women is also ensured. By 2000 end, about 36,130 Forest Protection Committees were managing a total of 10.25 million ha of forest area (see Table 3.1).

Government of India (GOI) has recently issued “Guidelines for JFM 2000” with a view to consolidate the gains made by JFM and iron out the issues confronting the Forest Protection Committees, Non-Governmental Organizations and the Forest Department. The issues covered include: providing legal status to JFM, increased participation of women, extension of JFM to areas > 40% crown cover, improving the effectiveness of micro-plans, recognition to self-initiated forest protection groups, and reinvestment in forest regeneration and development.

3.2. Program description

The following account is based on JFM arrangements made by Andhra Pradesh Forest Department.

Management objectives

JFM is a collaborative arrangement between the Forest Department and the people living on the forest fringe, whereby the people protect and manage degraded forests and help in their regeneration and the State, in return, gives rights to people for collection of Non-timber-forest-products (NTFP), fuel wood and a share of the final produce.

Enabling conditions

The Forest Department Representative takes the initiative in creating the enabling conditions, viz., identifying a group of hamlets, a village or village clusters as having potential for JFM. Subsequently, Divisional Forest Officer or an officer authorized by him, not below the rank of a Range Officer, visits the area and

convenes a General Body Meeting, in which at least 50% of the households need to be represented by adult members. The Officer explains the concept of Joint Forest Management (JFM) and establishes the process of dialogue between the Department and Community. It is desirable that the concerned officer should hold a series of participatory meetings with the community as well as separate meetings with women's groups and with other disadvantaged sections of the community. Through such meetings, the views and priorities of the community are ascertained and a Forest Protection Committee (called Vana Samrakshana Samithi or VSS locally) formed within the framework of the Government rules. Every household living in the hamlets / villages / cluster of villages, particularly those depending on forests for the daily needs, have the option of becoming a Member of the Committee. However, all SC / ST Members of the hamlets / villages / cluster of villages would become members of the committee automatically.

Table 3.1: Statistics on JFM area by end of 2000

State	Date of notification	No. of JFM Committees	Area under JFM ('000 ha)
Andhra Pradesh	28.09.92	6575	1.6
Orissa	3.08.88	3704	0.4
Madhya Pradesh	10.12.91	12038	5.8
All India		36130	10.0

Source: FSI State of Forests Report 2001

Members of VSS, individually and collectively are responsible for:

- Ensuring protection of forests against encroachment, grazing, fires and thefts of forest produce;
- Carrying out development of forests in accordance with the approved Joint Forest Management Plan;
- Making other villagers aware of the importance of forests;
- Helping the forest officers in carrying out forestry development/eco-development work in accordance with the approved Joint Forest Management Plan, and
- Apprehending the forest offenders and handing them over to the authorities concerned to take action under the provisions of the relevant forest Acts and Rules.

The main responsibilities of the Forest Department are as follows:

- Provide assistance to VSS in selection / demarcation of the Forest area to be put under JFM and in preparation of JFM Micro-Plan, approving the micro-plans, drawing of the budget for micro-plan and getting the budget approved.
- Transfer the skills of sound silvicultural treatment and soil conservation practices to the members of VSS and to guide JFM micro-plan implementation.
- Maintain biological diversity while developing the degraded forests under JFM Program.
- Assist the member of VSS in apprehending forest offenders

Planning and control

After the constitution of VSS, a Managing Committee is established for a two-year period as an executive arm of the VSS. The composition of Managing Committee is as follows:

10 to 15 elected representatives from the VSS of which at least 30% shall be women	Member
Concerned Forest Guard	Member
An officer nominated by the Project Officer, Integrated Tribal Development Authority	Member
The local NGO actively involved in the formation of the VSS	Member
Village Administrative Officer/Village Development Officer/Village Teacher	Member
Concerned Forester/Deputy Range Officer	Member-Secretary

The Managing Committee and Forest Range Officer, through a process of mutual consultation among all sections, particularly women and other disadvantaged sections of the community, prepare the JFM Plan. The labour component of the JFM Plan is worked out and the wages paid to the concerned members of the VSS. Some key regulations are the following:

- Cutting of trees is not permitted before they are ripe for harvesting. The Forest Department will also not allow cutting of the trees on the forestland being protected by the members of VSS except in the manner prescribed in the approved JFM Plan.
- The Divisional Forest Officer may supersede VSS for sufficient reasons only after the approval of the District Forestry Committee.

The Vana Samrakshana Samithi protecting the forests is entitled to the following share from the forests:

- All Non-Timber Forest Produce except those for which GCC holds the monopoly rights. However, the right to collection shall remain with the Vana Samrakshana Samithi members, if they so desire. Members are paid the collection charges upon delivery of the produce as per the rates fixed by the Government.
- In case of Beedi Leaf 50% of the net income from increased yield over and above the average yield of 5 years (in weight) due to better protection and management will be paid to VSS members equally.
- VSS are entitled to 100% share in timber and bamboo harvested from the regenerated degraded forests as prescribed in the approved Micro Plan after deducting the cost of harvesting and natural regeneration and tending. This amount will be retained in the joint account of Vana Samrakshana Samithies and the Forest Department for ploughing back in the forests under the management of the Vana Samrakshana Samithies.

Management impact

The joint forest management was initiated in 1992 in Andhra Pradesh. A total of 6,575 Vana Samrakshana Samithies (Forest Protection Committees), comprising of nearly 1.3 million members, are currently managing an area of 1.6 million ha. Only degraded forest areas have been taken under this programme. Individual members of the committee are entitled to get 50% of the net benefits from the forest produce

and the rest 50% is ploughed back for the development of the area. The large area under JFM has been achieved through large scale external funding from World Bank and NABBARD.

The impact of JFMs has been far-reaching, as described briefly here:

- Forests are getting rehabilitated, natural regeneration improved and biological diversity restored due to effective protection. Effective execution of soil and moisture conservation works has contributed in recharging the groundwater and increasing the period of availability of water for drinking and irrigation purposes.
- The involvement of village community has greatly contributed to the reduction in the incidences of smuggling, fire and grazing.
- Many VSS have increased availability of fuel and fodder in their villages. The production of Non-Timber Forest Produce has gone up resulting in the villagers getting more income from the collection of many products.
- Provision of individual biogas plants under Eco-development Program has discouraged the practice of storing huge stocks of firewood by the villagers. As a part of the support activities, the provision of more than 134 000 fuel-efficient stoves has been provided to VSS members that has cut down the consumption of firewood by more than 50%.
- Migration to urban areas has reduced. Results of an evaluation study done by consultants indicate that in tribal areas as much 102 person days of employment per family has been generated through JFM works.

3.3. Cases studies on JFM

Two studies will be presented to illustrate the implementation of JFM in AP. The first relates to the Visakhapatnam Forest Division, and the other to the Northern Coastal districts.

3.3.1. Visakhapatnam forest division

The data sources

The study is based on the sample survey conducted by the Department of Environmental Sciences, Andhra University, Visakhapatnam, AP (ENVID 2000). The total number of VSS formed was 159, of which 40 VSS were formed under the World Bank assisted APFP program and 119 under the Government supported VASU program. The sample size was 15 VSS (about 10% of all VSS), including 4 VSS of APFP and 11 VSS of VASU programs. The selection was made using stratified random sampling ensuring that at least one VSS was selected from each of the 12 Forest Sections in the Forest Division representing the entire spectrum of FD staff and Communities existing in the Division. The remaining 3 sampling units were allocated to one of the important sections of the Range (Chodavaram) to provide replicated information. Findings of the survey are briefly summarized according to headings used for describing forest management options.

Enabling condition

In all the sampled VSS, the preparatory work of FD in identifying and motivating village communities and maintaining their enthusiasm seemed to be most crucial requirements for the success of JFM. Among

others, the success was dependent on: i) the quality and continuity of extension services provided by the FD staff and associated NGOs; and (ii) participation of the community in the VSS and motivation provided to them by the FD to join the program. For example, the lack of a full time Range Officer in one of the Ranges affected results in all the VSS located therein. Similarly in three VSS, where the participation of households was low, viz. 10-40%, the survival rate of plants/ha was low (about 55%) and discontent and conflict reported during VSS meetings.

Planning and control

In the VSS sampled, about 40% of the VSS had Chairpersons, who could hardly read or write, about 26% had primary school education (5th class) and 33% had high school education (10th class). In such a situation, the role of the Member Secretary (who is a forest officer) was found to be very critical, as many types of record keeping including taking minutes of meeting, withdrawal and disbursement of funds and maintenance of account for a VSS are the responsibility of the FD Staff. In the end analysis, their role becomes very important. The distribution of Member Secretaries to JFM committees by their rank is given in Table 3.2.

Table 3.2: Distribution of member secretaries to JFM committees for planning and control

Hierarchy level	Frequency (%)	Average Cost of management/ha
Dy. Range Officer	15	378
Forester	39	231
Forest (Beat) Guard	46	192

Source: ENVID (2000)

The statistics shows the key importance of frontline officers and effect of training in leading the JFM movement including dialogue with village communities, maintaining records and micro planning and program implementation.

Management impact

The impact was assessed from several angles: social, economic, ecological and developmental.

Social Impact:

In the initial two years, the Department had to struggle in motivating village communities and organizing them into a viable VSS. In three years time, by 1997, the concept seemed to have caught up with neighbouring villages, participating voluntarily and establishing VSS. Thus, JFM seemed to have promoted local initiative and readiness to undertake collective developmental action. It is also reported to have reduced the need for migration in search of work, discouraged shifting cultivation (podu) and contributed to woman empowerment.

In the APFP, besides JFM, other development activities were also carried out such as starting of extension centers, building of access roads, bore wells, rice mills, water tank, community halls, temples, etc as requested by village communities and subject to limitation of funds. These extra activities helped in better motivation of villagers as results presented later show.

Economic Impact:

APFP, funded from WB loan money, performed better than VASU (Table 3.3).

Table 3.3: Employment generated by different programs

Program	Employment Generated Person Days/Household
APFP	83
VASU	61

On the whole, 2-3 person months of employment was created per household especially during lean periods. This pleased the village communities, as they could find work at their own places. Besides the creation of employment opportunity, JFM has played a major role in keeping the professional moneylenders at a distance. In most of villages, women groups have started savings and created a revolving fund by utilizing the matching grant from the government. In some villages, head loaders and shifting cultivators, utilizing the grant of the government, have started economic activities like cattle rearing to generate income for living.

The survey provided substantial evidence that the economic status of the community is improving through JFM. However, it would be a difficult task to make this improvement continuing and sustainable in the coming years, if villagers do not plan to maximize the NTFP production to compensate for the possible withdrawal of the government provided person-days through treatment works. Hence, VSS need to be encouraged to concentrate to build their own resources for the management.

Ecological Impact:

The JFM impact is visible in two ways: directly in the area planted and indirectly in the increased percentage of households participating as given in Table 3.4.

Table 3.4: Plantation survival and household participation in different programs

Program	Plantation Survival (%)	Household Participating (%)
APFP	74	90
VASU	60	63

The above statistics shows that increased spending in APFP enabled more households to participate, which in turn affected the survival rate of plantations.

In all the VSS, natural regeneration was observed to be coming up from increased protection in the whole area. Bamboo was the most preferred species and planted in 12 of the 15 VSS. Besides, natural regeneration of plants, the faunal diversity was found to have improved significantly as indicated by increased sighting of wild animals in the area. The soil and moisture conservation was also observed to have improved.

The conclusions reached from the survey were that JFM has promoted and revitalized, the participatory concept among the forest dependent communities and has made a positive beginning in initiating for an alternate institutional management.

Some Negative Developments:

In four of the 15 villages, the Chairperson in the course of four years had become a power centre and indulging in favouring one community over the other and widening the developmental gap. In some of VSS, where commercial crops were grown, the community was sharing the forestland and demarcating in the name of individual members. In such cases, the role of Forest Department becomes very critical to provide a balance.

3.3.2. Northern coastal districts of AP

Some key statistics for JFM in the coastal districts of AP are given in Table 3.5.

Table 3.5: Key statistics on JFM for three coastal districts of AP

Parameters	Districts			Total
	VSP	VZM	SKL	
JFM area (ha)	118 069	41 500	29 620	189 189
VSS (number)	960	189	269	1 418
Members (number)	86 732	12 917	22 415	122 064
Total Area (ha)	81 702	32 636	23 967	138 305
Total Cost (Rs)	3 426.95	1241.07	1 146.97	5 814.99
Total Cost/area	4 194.451	3 802.764	4 785.622	4 204.468
Man-days Generated	8 567 375	3545914	3277057	15 390 346
Days/house hold	104.8613	108.6504	136.732	111.2783

Source: Forest Department, AP

The evaluation was conducted by Samata (2001) using a sample of 29 VSS spread over the four northern coastal districts including Srikakulam, Vizianagaram, Visakhapatnam and East Godavari. The area was stratified into 3 homogenous socio-economic and landscape types: the hills, foothills and the plains, differing in their forest conditions as well as ethnic composition. Hills are covered with dense forests or vastly degraded vegetation and inhabited by homogenous tribal groups. In the foothills, human settlements and forests form a heterogeneous pattern, but people are heavily dependent on forests. In the plains, the remaining forests are overexploited and are under extreme pressure. The community participation in forest management is also very limited.

Objectives

People's perception of taking up JFM or giving up podu differed vastly. Typical reasons given were:

- Neighboring villages were getting the JFM scheme and benefits attached;
- Podu cultivation was bad, as Officials explained to them;
- JFM would stop smuggling and illegal felling of timber;
- They would not be subject to eviction from forest areas.

Enabling conditions

As in the earlier survey, this study too stresses the need for extreme care in identifying right villages, right people and right programs as key to success or failure of JFM. Moreover, JFM could help regenerate

forests and develop the local communities on a long-term basis. Therefore, the program needs to be viewed as an opportunity for people's empowerment and success judged not only in terms of number of VSS and area managed. This calls for a major re-thinking of the role of foresters and forestry based on philosophy of JFM and how the process could be dove-tailed with traditional knowledge and practices of people. It calls for a change in the forester's perception of the shifting agriculture in the light of the tribal's livelihood patterns and customs. Finally, the study emphasizes the review of the existing forest laws, rules and procedures with a view to facilitate rather than hinder JFM. Like-wise, information sharing and transparency could be important factors in promoting JFM. To make JFM attractive to the local people and enhance its impact, the Government has decided to integrate all development programs in a JFM village. As a result some community development activities beyond JFM have been included in JFM.

Planning and control

The survey found the forestry micro-plans very rigid and top down. They lacked sensitivity to traditional practices and had narrow focus in space and time. Conflicts of interests were observed in the choice of land use and species between the FD and VSS members. For the tribal people, the suitability criteria for land utilization are different than those for the FD officers, especially in relation to shifting agriculture, which is considered indispensable by the people. In the plains, the people-forest symbiosis was found less strong than in the hills. The speed at which JFM has been implemented also made the planning process very ad hoc and haphazard.

Management impact

The survey showed that JFM:

- Had been able to build an institutional structure through VSS, Managing Committee, system for fund management, etc.
- Aroused people's interest and ensured their participation in forest management;
- Made FD and people to interact for the first time as partners;
- Involved local people in implementing forestry development activities;
- Assisted in formation of women thrift societies;
- Reduced the animosity and gap between FD and indigenous people;
- Helped regeneration of degraded forests;
- Gave an opportunity to FD to demonstrate their comparative advantage of being a technical department closely linked to the people's development.

Negative aspects of JFM were also observed such as:

- Almost in all VSS, FD did not take into account traditional village boundaries while defining JFM boundaries and problems like ongoing smuggling of timber, shifting cultivation, NTFP collection rights, etc. were not taken into account at the time of formation. These were giving rise to tension in villages.
- There was a lack of transparency in many VSS and wasteful expenditure in others. There was no sharing of profit or compounding of fees even in a single village. Bamboo harvesting could not be undertaken as working plans for the area needed approval of the Central Government.
- Many villagers felt that the responsibility has been shared but not the benefits. Industry and mining leases were still being negotiated in the area without the knowledge of the community.

- In many villages, grazing and NTFP collection were traditionally done out side JFM areas, which was causing conflict with neighbouring villages. In the plains, firewood and fodder were illegally collected, which must be taken into account, while preparing the micro-plans.
- Monopoly laws were a serious hindrance to the economic progress of VSS and special permission has to be obtained for sale of NTFP outside their areas.
- There was a lack of coordination between development plans of forest and other Departments, especially ITDA.
- Serious conflicts were noticed between JFM (and induction of money) and traditional forest management practices of the community involving even murder.

3.4. State of forests in the study area

The changes in forest cover since 1993 for the selected districts of Andhra Pradesh under study over time are given in Table 3.6.

Table 3.6: District-wise forest cover (sq. km) during 1993-1999

District	Geographic area	Year of Assessment				Change during 1993-97	Scrub 1999
		1993	1995	1997	1999		
Adilabad	16 128	6 496	6 422	6 202	5 980	-516	198
Godavari East	10 807	3 626	3 591	3 508	3 567	-59	182
Visakhapatnam	11 161	7 491	7 477	4 459	3 435	-4 056	792
Khammam	16 029	7 282	7 271	7 310	7 160	-122	226
Warangal	12 846	3 467	3 454	3 259	3 145	-322	119
Total	66 971	28 362	28 215	24 738	23 287	-5 075	1 517

Source: FSI (1991, 1993, 1995, 1997 & 1999)

The depletion of forests is noticeable in all the districts (Adilabad, Warangal, Khammam) and especially high in Vishakapatnam District. The changes are attributed to encroachment and anti-social activities of Naxalite Groups.

3.5. Conclusions

It may be noted that the forest development in AP has been strongly supported by external funding. Many questions have been raised about sustainability of JFM. Most of forestry institutions still retain the names, structure and functions designed during colonial times posts like conservator of forests, working plan officers, divisional forest officer, range officers, forest guard, etc. with little change in their training and terms of references. Could JFM be transformed into a real people's movement (to be described in the next section), and the Forest Department assuming the role of facilitators, advisors and capacity builders to green the country?

The study recommends the future directions for JFM as follows:

- The FD Staff should provide advisory and extension services only and help the community in controlling and apprehending offenders;

- Local communities should be fully free to manage forests under them with micro-plans as guide and not a mandatory document; and
- Local communities should be free to sell their forest produce according to their preferences and convenience with social safeguards from the Government.

According to Singh and Marzoli (1996) the Forest Department has to make hard decisions aimed at changing forestry institutions, to foster a sense of social responsibility and focus on meeting the economic and social needs of people. Amongst many pessimistic scenarios about the forests of the country, there would be one scenario wherein it is possible to harmonize the technical and social goals. This option calls for an intensive management of forests in an overall framework of integrated area development, appropriate institutional environment and ideological changes of which investment, technology and people participation will constitute an inseparable part.

With passage of time, as community gets more and more involved, JFM is bound to reflect more of people priorities than the immediate environmental concern of foresters or NGOs. TERI (1999) study does discern a trend that JFM is slowly merging into a form of sustainable forestry which augments the forestry regimes with processes for rapid adaptation to changes in what people need, want and can do. As an adaptive social process it is striving to create sufficient future forest opportunity to satisfy potentially competitive/conflicting interests that would diminish the forest if left unresolved.

Chapter 4

COMMUNITY FOREST MANAGEMENT

4.1. Introduction

The aim in this Section is to assess the strengths and weaknesses of the Community Forest Management (CFM), from technical, ecological, social and economic perspectives. In particular, the write-up is designed to enhance the understanding of CFM by government officials and public, narrow down differences in the perception about it and, thus contribute to its acceptance as an option for sustainable forest management by policy makers.

While Andhra Pradesh was the state chosen for the study of JFM, Orissa was the choice for CFM. The JFM villages in AP, and for that matter in all the States of the country, are well documented and a list of them can easily be procured because the process has been facilitated by substantial foreign assistance, which requires some form of technical planning, monitoring and control. In contrast, very little is known or documented about CFM in Orissa or anywhere else in the country because the process is informal-born and nurtured by the local community. Knowledge about them mostly remains within four walls of a hamlet or village.

Since the start of research, it took almost a year to compile a list of CFM villages for one district. We were getting very concerned as we wished to cover three districts in two years, and after one year even the list of villages was not ready. Promises to provide information were just mere promises. The waiting period was, however, not that waste of time, as we came to know, from personal acquaintances, about some of the very few published reports, which were mostly out of print and not available in the Forest Department or Public Libraries. We also visited some CFM villages and were thoroughly impressed by the forest conditions, ground flora and soil humus.

The need for absolute objectivity in selecting sample villages and providing infallible evidence of actual forest cover condition and changes associated with CFM was being felt stronger and stronger as time passed because of observed polarization of views about CFM between NGOs and the Forest Department staff.

4.2. Methodology

The main steps in implementing the study were the following:

4.2.1. Compilation of existing data

Prior to start of the fieldwork, the available information on CFM in Orissa was collected and reviewed, and extensive feedback of different organizations / people working in the region obtained. The studies available on CFM were mostly descriptive in nature and, in particular, there was an absence of a single comprehensive and reliable list of CFM for the State.

4.2.2. Field survey

The two key issues in the design were objective choice of sample districts and choice of villages. Districts were chosen to represent an east to west cross section of the state: the range of forest cover, population distribution and different stages of economic development (i.e. industrialization) (Table 4.1).

Table 4.1: Socio-economic and ecological profile of the districts (area in sq. km)

District	Geographic Area	Forest Cover (%)	(Population density (individual / sq. km))	No. Employed in Manufacturing
Kandhamal	8021	67.2	81	479
Mayurbhanj	10418	39.7	213	2,937
Koraput	8807	16.85	134	8,443

Source: FSI (2001), Census (2001), Statistical Handbook of Orissa (1987)

The main survey steps were as follows:

- Compilation of a reliable list of CFM villages by district and block with the help of local NGOs
- Matching and merging the NGOs list with Census Village Directory. This step was rather tedious as many errors were encountered in the matching process as CFM is generally associated with tribal hamlets and Census with revenue villages;
- Random selection of villages with probability proportional to size of CFM; detailed field study of ecological, social, economic attributes of CFM using a structured enquiry and participatory approach. Validation of the fieldwork using an independent team.

As the knowledge on the pattern of spatial variation of CFM became available, the field survey design was further improved by changing it from one-stage PPS to two-stage PPS (see Table 4.2).

Table 4.2: Survey design and sample size

District	Block	Total villages Having CFM	Sample size	Survey Design
Kandhamal	6	426	26	One/ two stage PPS
Mayurbhanj	2	88	30	Two stage PPS
Koraput	2	153	30	Two stage PPS

4.2.3. Remote sensing / GIS

The steps involved were as follows:

- Establishment of geo-referenced Census Village Maps using 1: 50, 000 topographic sheets as control;

- Integration of statistical data of National Census in the village database;
- Rectification of each of 1990 and 2001 of high-resolution satellite images of the district with 1: 50,000 topographic maps, and their interdependent interpretation to generate change matrices.
- Field validation of interpretation and correction of interpreted data. The technique used was considered essential in order to know the path of change (and not only its extent) explained later in detail.
- Overlaying of village layer on the change maps and associating census and sample survey statistics and generating a comprehensive statistical and spatial database for analysis and interpretation.

A schematic depiction of the methodology is given in Figure 4.1 and an example of spatial database in Figure 4.2:

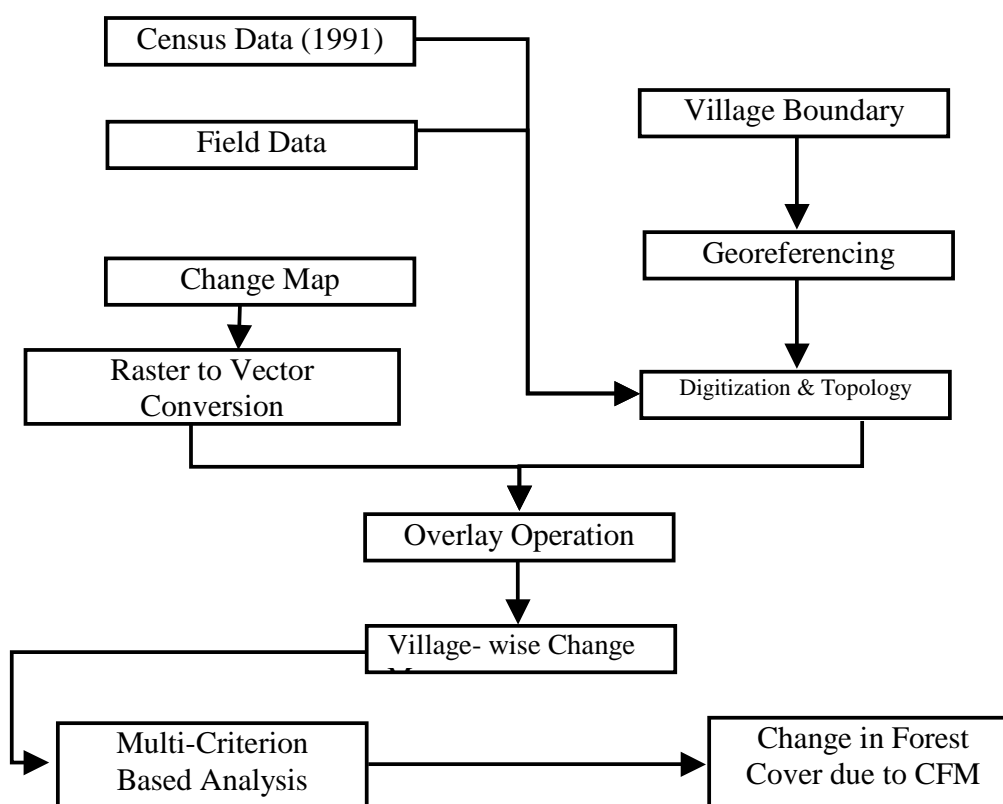


Figure 4.1: A schematic presentation of the methodology on application of remote sensing and GIS

4.3. Findings

The term CFM, as used in the report, refers to the self-initiated protection and regeneration of patches of forest of varying sizes through formal/semi-formal village level institutions born out of self-realization or enhanced social consciousness of important roles of forests for their social, ecological and economic well-being, and collective action by the community towards the protection, regeneration and management

of forests. For such purposes, the community does not require any financial/technical assistance from external sources except of raising awareness in some cases, where Forest Department (FD) and NGOs role serve as a catalyst or source of inspiration.

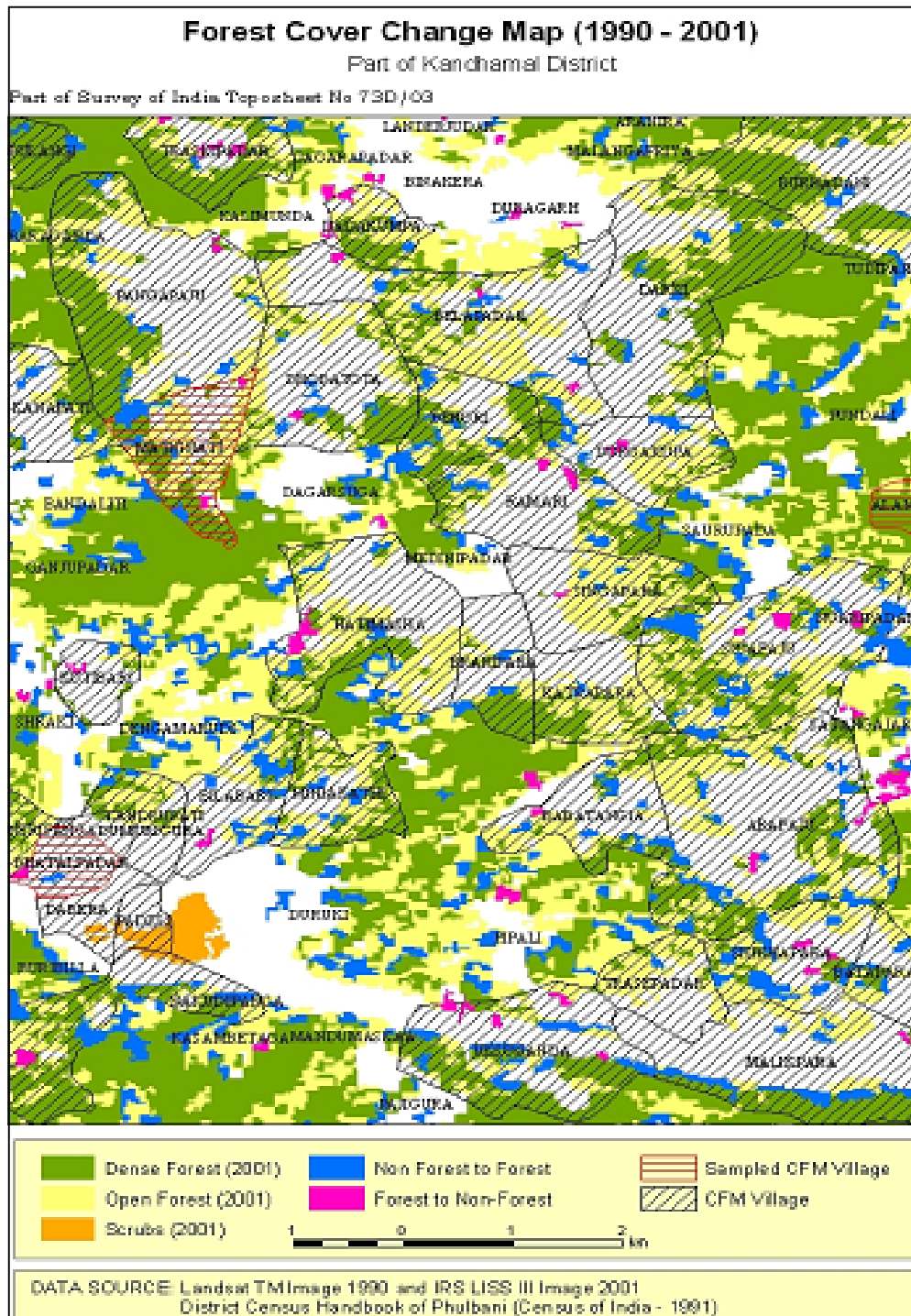


Figure 4.2: An example of the output from RS and GIS

4.3.1. The number of villages practising CFM

Two questions are very relevant for discussion:

- How reliable is the NGOs' list of CFM villages?
- Is there an objective approach to estimate the number and the size of CFM?

The remote sensing and sample survey methods, both provided alternative and quite comparable results as will be soon described.

Field Survey

Majority of the randomly selected villages (85%) of the Kandhamal District were found to conform to CFM definition. It was, however, observed during the field survey in Kandhamal that many more villages existed than appearing in the NGOs' list. The situation in Koraput was just the opposite (see Table 4.3).

To obtain a statistically sound estimate of the total number of CFM villages in a block or district, the survey design was modified from one to two-stage PPS, treating a cluster of villages (viz. a gram-panchayat) as the primary and individual villages / hamlets therein as the secondary sampling units. During the field survey all villages in a selected primary sampling unit were visited, irrespective of their being in NGO list or not.

Box 1: Two Stage Probability Proportional to Size (PPS) Design

In the present case, villages for detailed study were chosen in two stages: first a specified number of Gram-Panchayats were chosen randomly; and then specified numbers of villages were randomly chosen from each of the selected Panchayats. The probability for selecting a Panchayat was made proportional to the total number of villages practicing CFM as reported by NGOs.

When the survey team visited a Panchayat, they made a rapid reconnaissance of all villages and checked the presence or absence of CFM village by village. Then, two CFM villages were visited for a detailed study in a given Panchayat.

Let V be the total number of villages in a Block or district under study; v the total number of villages occurring in the randomly selected Panchayats of which u were found to be practicing CFM; then the estimate of the total number of CFM villages in the survey area is: $V*(u/v)$.

Table 4.3: Estimated number of CFM villages before and after completion of the field survey

District	Estimate of the number of CFM Villages			Mean size of A CFM Patch (ha)
	Before survey	After survey	Ratio	
Kandhamal (six blocks)	426	916	2.15	37
Mayurbhanj (two blocks)	88	117	1.33	184
Koraput (two blocks)	153	92	0.60	74

Remote Sensing Survey

The remote sensing survey was designed to produce change matrices for the study area in accordance with the sampling survey design (Table 4.4, 4.5 & 4.6). Such matrices are difficult to read, but rich in information. Their specific role was to provide/estimate forest cover change information.

Forest and land cover change (sq. km.) between 1990 and 2001

Table 4.4: Change Matrix for sampled villages in the CFM stratum (n=26)

Land Cover Classes in 2001	Land Cover Classes in 1990		Total-2001
	Forest	Non-forest	
Forest	14.6	6.7	21.3
Non-forest	1.8	37.1	38.9
Total-1990	16.4	43.8	60.2

Table 4.5: Change Matrix for the entire CFM stratum (n=426)

Land Cover Classes in 2001	Land Cover Classes in 1990		Total-2001
	Forest	Non-forest	
Forest- 2001	234.4	88.7	323.0
Non-forest 2001	31.9	415.2	447.0
Total-1990	266.2	503.8	770.1

Table 4.6: Change Matrix for the entire Non-CFM stratum (n=949)

Land Cover Classes in 2001	Land Cover Classes in 1990		Total-2001
	Forest	Non-forest	
Forest- 2001	584.2	170.4	754.7
Non-forest 2001	67.4	652.4	719.8
Total-1990	651.6	822.8	1474.4

The pattern of land use change (reforestation and deforestation) for sampled villages and CFM stratum is similar (Table 4.4 & 4.5), showing stratum represents CFM population. The observed pattern of higher value for reforestation than deforestation confirms the CFM list and also that CFM has contributed to increase in forest cover. Table 4.7 collates forest cover statistics for 1990 and 2001 from the above three change matrices to facilitate comparison.

Table 4.7: Summary of change in forest cover (%) during 1990-2001

Universe	Total Forest (1990)	Total Forest (2001)	Changes During 1990-2001
Sampled villages	27.3	35.5	8.2
CFM villages	34.6	41.9	7.3
Non-CFM villages	44.2	51.2	7.0

The most startling finding was that the forest cover in the CFM and Non-CFM stratum increased almost in same ratio against the expectation that the villages falling in the Non-CFM stratum would show less forest cover in 2001 compared to 1990 or could be almost the same. Do results imply that many more communities were practicing CFM in non-CFM stratum of the district without being noticed even by NGOs. The findings were perplexing calling for a reality check of the remote sensing results. Data was also collected during the field survey, using a design, which allowed random selection from both CFM and Non-CFM groups of villages.

The second field visit confirmed that findings of two-date remote sensing survey were reliable and that CFM was being practiced in the Non-CFM stratum on a large scale almost in the same proportion as in the first stratum. A summary of transition probabilities for forest and land cover change for CFM and Non-CFM strata is given in table 4.8:

Table 4.8: Land use transition probabilities based on 1990 and 2001 remote sensing survey

Land Use Change Classes	Transition Probabilities	
	CFM Stratum	Non-CFM Stratum
<u>No change</u>		
Forest	0.30	0.40
Non-forest	0.54	0.44
<u>Change</u>		
Reforestation	0.12	0.12
Deforestation	0.04	0.04
Total	1.00	1.00

It may be noted that probability of change in land use is same in Non-CFM stratum as compared to CFM stratum. However, the probability of no change under forest area is more in the former case. Further from the remote sensing results, the following inferences can be drawn.

- The villages in Non-CFM strata are on an average located in more remote and forested regions, which might have been the main reason for the lack of notice by the NGOs.
- The community had not only protected the forest but also regenerated the degraded land.
- The concentration of CFM is more in the area where there is lesser forest cover as compared to Non-CFM, which are found to be more in area where the forest cover is high.

- The areas not protected by any community are undergoing deforestation, being a common property resource.

The findings of field survey, structured enquiry, remote sensing and revisit to the field, all reinforce each other and establish that communities are making significant contribution in regenerating and protecting forests. Another important conclusion is that the method of remote sensing and field survey used for the study is robust and cost-effective.

The sample survey was the basis for interpreting the relation between forests and the community including social, ecological and economic components (see Table 4.9), which the following Section presents.

Table 4.9: Components and attributes of field data under study

Components	Attributes under study
Social	Structure and function of CFM as institutions, year of formation
Ecological	Density of forest, modal DBH of trees, dominant species, size of the forest
Economic	Livelihood dependency on agriculture, forest and daily-wages

4.3.2. The social dimension of CFM

The association of the tribal community and forest is since time immemorial. Even after the introduction of restriction in the use of forests by the community during the colonial times, their bona fide needs were met by the Forest Department; and local people were associated in forest protection and regeneration. The most important and fundamental contributions of CFM seem to be enriching of 'social capital', by raising awareness and social consciousness about forest protection and regeneration. The term Social Capital here refers to the ability of the local communities to work together for mutual benefits. These community-based actions are regulated by both formal as well as informal norms, networks and institutions. This enriched social capital at a village level seems to grow into a federation of villages, underpinned with sustainable development ideals.

Planning and control of CFM appears to be steered by a select group in villages or hamlets, either selected or elected from the particular village, following local customs and traditions. These traditional institutions are responsible for organizing meetings, where rules and regulations towards management and monitoring of forest resources contained in CFM are collectively decided. In addition, these committees also decide about the benefit sharing from the resources and set punitive measures (social & monetary) for the offenders. The entire gamut of the issues mentioned above is discussed and decided in the context of the village concerned and societal needs of the communities. This makes them as one of the most decentralized systems operating at the village level.

From the interaction with the communities and observations recorded during the field survey, it was revealed that the villagers, involved in the protection of the forests, enjoyed benefits of timber for house-construction, fuel-wood, and variety of forest products- mainly non-timber for their subsistence. Nevertheless, the communities collectively decide from time to time on regulation of resources from the CFM area. There is, however, no regulation on resource use from the forests outside the CFM boundary. The motivation in such cases is meeting of the subsistence needs in form of:

- Fuel wood collection for household use and sale in markets
- Fencing of agricultural lands
- Unavailability of alternate source of income

The enhanced level of income and a sense of achievement to villagers that regenerated the forest with the help of self-formed committee seem to serve as an inspiration in non-CFM villages nearby. Another trigger mechanism is the hardship faced by the community in meeting their subsistence needs because of declining forest cover/resources in non-CFM forest areas. Increased hardship, combined with the demonstration effect of CFM, seems to motivate other communities towards forest regeneration/protection. It is interesting to mention here that the degree of protection and health of CFM patches has become a quote of reference and pride amongst many villages, as noticed during the fieldwork. As a sequel to this, those villages that do not have forested land in vicinity expressed the desire for protection to forest at a distance place provided Government grants them legitimacy over that particular patch of forest.

4.3.3. The ecological dimension of CFM

Historical Trends of Deforestation

The data available since 1960 for the three districts, namely Kandhamal, Koraput and Mayurbhanj, exhibits different trends of deforestation, arising from the cultural background of the community, externally imposed development process and community's response towards forest protection and regeneration (Figure 4.3). Between 1960-90, there is a continuous decline in the forest cover in all the three districts. However, the rate of decline is significantly steep in Koraput and Kandhamal as compared to Mayurbhanj district. Mayurbhanj is different from other two districts in terms of its stable land use system and very slow rate of change, which can be partly attributed to better awareness and sensitization amongst communities involved and rulers' (viz. the king of Mayurbhanj) initiatives towards protection of the green cover. Besides, in later phase (post-independent era), some visionaries motivated other villages to join the CFM movement and later formed bigger units. These federations of villages facilitate processing and marketing of NTFPs through the active involvement of local communities and FD, the latter being a part of the process, and contributing towards the growth of CFM. This synergy resulted in a fusion of social and economic dimensions, which in turn motivated the local community for conservation of natural resources. Mayurbhanj seems to present a good model of achieving sustainable development.

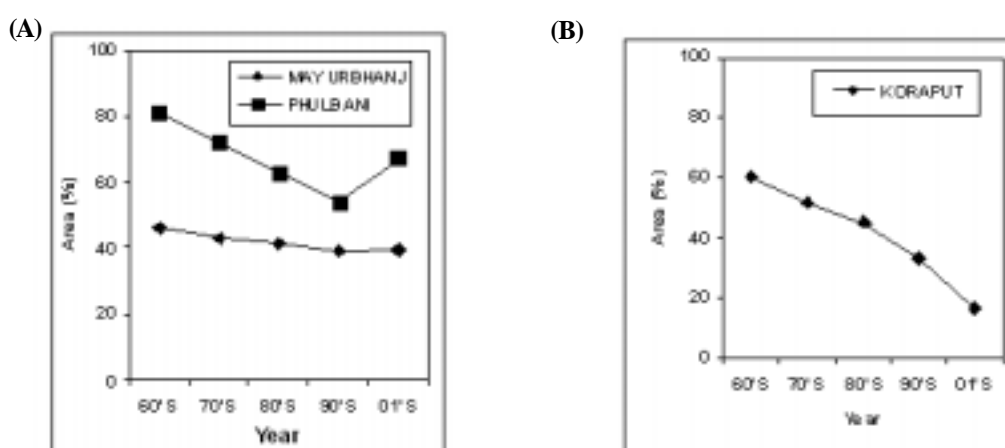


Figure 4.3(A&B): Forest cover change in three sampled districts at different time intervals.

Source: Compiled from FSI (1991 & 2001) & Sahu and Das (1997)

In contrast, Koraput exhibits another extreme model of development. The district is among the most industrialized in the State, having paper and pulp industry, aeronautic industry etc. It is equally known for starvation deaths year after year. External investments do not seem to have the desired “trickle-down effect”. The local communities here continued to practise shifting cultivation. The whole landscape today has a desert like appearance. Only recently, the local community has realized the mistake and sought to make amends.

The history of land use change in Kandhamal is half-way between those of the other two districts. The awareness towards conservation dawned when the communities themselves realized that they have to assume responsibility and avoid the livelihood threats. Such realization by different people, organizations and FD around 1990 became instrumental in the reversal of trend, as it was in Mayurbhanj.

The Historic Trend of CFM Movement

Among the most important ecological contributions of the CFM movement has been the reversal of the historic trends of deforestation in the study area (see Figure 4.3). Kandhamal (53.7% to 67.2%) and Mayurbhanj (39% to 39.7%) show an increase in the forest cover since 1990, with a pronounced peak in case of Kandhamal. Koraput showed a continuous decline over the last 40 years (60% to 17%), a trend considered alarming. Shifting cultivation, practised by the locals, was considered the main cause.

Such changes are attributed to the resource use decisions made by households and local communities in pursuit of immediate survival and livelihood security, which are influenced by the policies, institutions and technologies that impact on their lives. Such decisions are the main determinants of links between poverty elimination, improved land care and sustainable livelihoods (Jones, 1999). However, in the present context, the trend reversal of forest cover in the post-90 period can be better explained through the history/spread of CFMs.

The field enquiry revealed that the origin of CFM as a movement started around 30-40 years ago. However, it assumed the form of a mass movement only in the last 10-15 years. From the field survey in the three districts, it is found that 69 to 75 % of such committees were formed in last 15 years (Fig. 4.4). When we juxtapose the trends of CFM (observed in the fieldwork) with that of the finding of remote sensing, the two get validated/reinforced. The trend also indicates the strong demonstration effect of CFM.

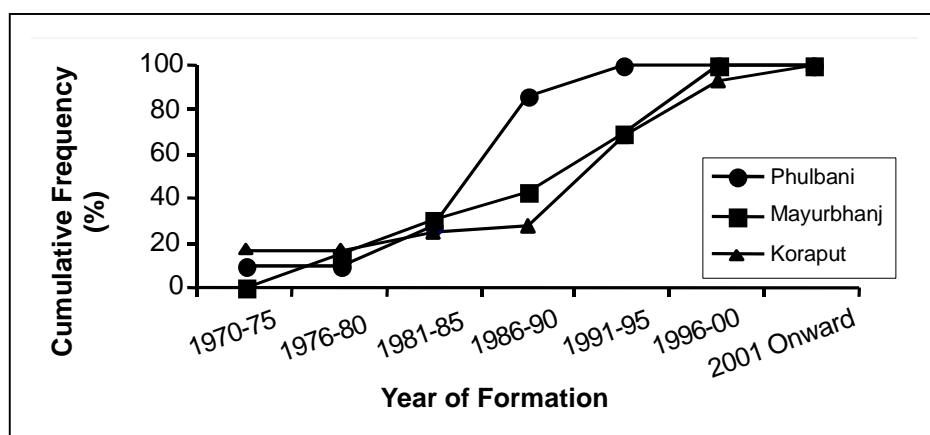


Figure 4.4: Formation of CFM in different districts in time series

Following are some of the CFM-induced changes, observed during the field survey:

- The forest cover under most of the CFMs was well stocked with canopy more than 60%.
- The stands were found to be regenerating naturally, indicating strict protection.
- Majority of CFM stands in Kandhamal and Mayurbhanj had dominant species as Sal.
- Strict measures towards the regulation of fire and felling had been introduced.
- Increase in soil moisture due to the leaf litter accumulation
- Enhanced biodiversity due to special protection of fruits/NTFPs bearing trees
- Trees for household construction are marked and felled under the supervision of the concerned members.

The Evolutionary Trends in CFM Movement

CFMs in Orissa represent three stages of evolution and three spatial dimensions. First is the stage where it operates at the village level as found in the Kandhamal district. Second, it operates at the villages' federation level, for eg. Budhkumari. The last, the most evolved of these institutions is at the district level as exhibited in the case of Nayagarh district. Another very important aspect of the trend is that as it advances from the village to district level, the institutions get more codified and thus more independent in execution and operation. The size of the circle represents the complexities of the institutions in terms of its execution.

There are horizontal as well as vertical expansions of the concept. It is replicating from village to village and also showing the trend of federation. In terms of temporal scale, after the village level institutions, the communities realized the need of federation for better protection and bargaining for their NTFPs. The formation of Budh-khamari federation had its support from the FD and local politician. Whereas the formation of federation at a district level, as in the case of Nayagarh had the support of NGOs. One of the important aspects of Nayagarh federation is that it is just a forum but not a registered society, a fact exploited by the FD, which claims that a handful people misuse the forum for their vested interest. Here, the exercise of rights over forest is beyond the control of Department. Such alienation may trigger a chaotic situation when the actual price of timber from their protected patch of forest is fully realized by the community. It is therefore strongly felt that FD should be able to mobilize and harmonize the movement and sensitivity related to forest.

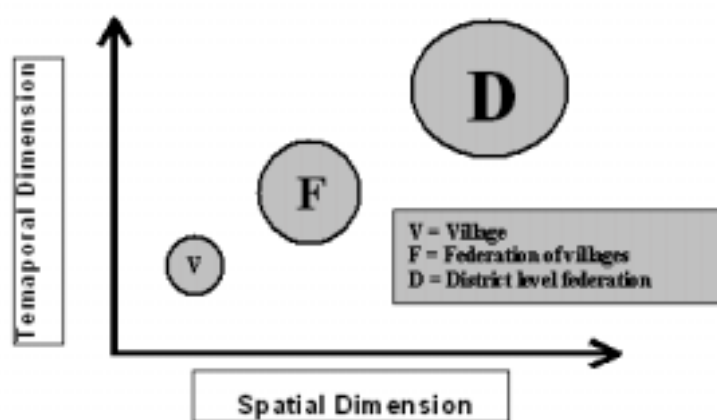


Figure 4.5: A conceptual hierarchy of spread and evolution of CFM as institutions in Orissa

4.3.4. Economic dimensions

Based on the sample survey results of the three districts, the rural livelihood patterns could be broadly categorized into: agriculture-based, forest-based and daily wage earning. Agriculture is found to be the main source of livelihoods in all the three districts with highest value recorded for Koraput (Table 4.10).

Table 4.10: Forms of livelihood and dependency (%)

Livelihood Source	Kandhamal	Koraput	Mayurbhanj
Agriculture	47	66	48
Forest	30	8	41
Daily Wages	23	26	11

The scope of enhancing agricultural productivity is limited in the study areas as most of the agriculture is rain fed. Daily wages constitute a significant source of rural income. The rising infrastructure development at the village level, through various government-sponsored programmes in the last decade, is creating more employment opportunities. In the absence of other avenues, forest is still an important component of sustainable livelihood. The forestry sector is making highest contribution in Mayurbhanj and lowest in Koraput district. The daily wages trends are just the opposite.

As already stated, forests are the important source of livelihood for the rural populace. But, then, this again is a function of forest area, the current level of their productivity and the degree of utilization. Koraput has the lowest forest cover among the three and therefore, recorded the least contribution of forests in the livelihood. Mayurbhanj recorded the highest contribution, although the total forest cover in Kandhamal is higher. In addition, social capital and historical factors also play an important role. Mayurbhanj, thanks to the past initiatives by the king, the communities are well advanced in protection of forest and their sustainable use.

Later phase in the post-independent era, some visionaries like Mr. Gorachand Mohanta and Mr. Bishnu Nath Purty with the support of the then DFO Dr. Swain made a pioneering effort to bring together a number of CFM villages to form a federation. This federation acted as a torchbearer and impressed other villages to join the movement.

As a result, this district is fully sensitized to the need to protect and manage forest resources (including value addition) accounting for higher contribution of forest to overall livelihood. Communities here are more organized towards processing and marketing of NTFPs in addition to forest protection and strengthening institutions for the purpose.

Using the village level data on livelihood, correlation coefficients were calculated between the contribution to livelihood by main sectors and the CFM area in the three districts (see Table 4.11). Mayurbhanj alone showed a positive correlation between the CFM area and forest sector contribution to the livelihood (Table 4.11). As the forest area is more or less unchanged in the district, the increase of contribution must have come from value addition. In case of the other two districts, CFM area has negative correlation with forest sector contribution and positive correlation with the agriculture sector contributions. This indicates that CFMs here are yet to become source of livelihood.

Table 4.11: Correlation matrix between different livelihood options and CFM area**Kandhamal**

Livelihood Option	CFM	Agriculture	Forest	Daily Wages
CFM	1.00			
Agriculture	0.61	1.00		
Forest	-0.29	-0.37	1.00	
Daily Wages	-0.23	-0.51	-0.60	1.00

Mayurbhanj

Livelihood Option	CFM	Agriculture	Forest	Daily Wages
CFM	1.00			
Agriculture	-0.14	1.00		
Forest	0.32	-0.66	1.00	
Daily Wages	-0.17	-0.53	-0.29	1.00

Koraput

Livelihood Option	CFM	Agriculture	Forest	Daily Wages
CFM	1.00			
Agriculture	0.42	1.00		
Forest	-0.51	-0.95	1.00	
Daily Wages	0.38	0.06	-0.37	1.00

Another important observation is the negative correlation between livelihood coming from agriculture and forest in all the three districts, with Koraput recording the maximum value. The general trend is expected in a situation like here, where subsistence agriculture and forest together constitute the chunk of the livelihood options (74% to 89%). Further, due to social, ecological and technological capacities of the region makes both these sector labour intensive. This only means that investment of human power is proportional to economic returns from each component. Therefore, if the return from the forest is more, people will invest more time in the same and subsequently lesser time in the other. The higher value for Koraput is mainly because of extensification of agricultural land, especially the practice of shifting cultivation to meet the growing need. As a result, Koraput witnessed continuous loss in forest cover. Different packages towards promoting CFM need to be designed subsuming the different level of realization amongst communities for protection of forest resources.

The negative relationship between livelihood met from forest and daily wages is self-explanatory, i.e., the area with organized forestry and its use will depend less on daily wages.

4.3.5. Current contribution and potentials on NTFPs

Using the information in the Table 4.10, an estimate was made of the current contributions and future potential of forests for economic development with special reference to non-timber forest products (Table 4.12).

Table 4.12: Potential of NTFP contribution to livelihood in the study area

Variable	Kandhamal	Mayurbhanj	Koraput
Forest share to total livelihood (%)	30	41	8
Rural population in the District ('000 persons)	604	2067	982
Forest share to livelihood ('000 persons)	181	847	79
Forest area of the District ('000 ha)	512	394	134
Forests contribution to livelihood (persons/ha)	0.35	2.14	0.59

Source : Population from 2001 National Census and Forest Cover from FSI 1999 State of Forest Report

The current contribution of forest, in Mayurbhanj and Koraput is respectively almost six times and two times of Kandhamal, despite the fact that Kandhamal has the largest forest cover. These differences can be attributed to an inadequate utilization of the NTFPs potential in Kandhamal. The inadequate utilization here refers mainly to the processes of value addition and opportunities for marketing of the NTFPs. Thus, in overall development scenario of Kandhamal, NTFPs hold a huge untapped potential towards contribution to livelihood, provided the new policies on enabling the communities for optimum harvest and adequate marketing is in the place. Experiences and knowledge of Mayurbhanj (especially federation level institutions) can serve as starting point for communities of Kandhamal. On the other hand, the federation at Mayurbhanj needs to be integrated with other government and non-governments organization based on the model recommended later in this report. The strategies for Koraput have to be different, i.e., first would be to focus in reversing the trend of decline in forest cover by promoting agroforestry and initiating afforestation programme under communities ownership.

Although the total number of items/species (for domestic and /or commercial) used by the communities is higher in Kandhamal, the average income coming from the forests is higher in Mayurbahnj (Table 13). Koraput came a poor third, both in terms of number of species used and income made from them. Sal leaves, fruits and kendu leaves are common to all sampled districts, which has commercial value. The trend of use of species, especially observed in Mayurbahnj, indicates that Kandhamal can increase its economic share by better organization and adequate marketing.

Table 4.13: Summary of products and income from NTFPs

District	Number of species/products	Average income (Rs./family/year)
Kandhamal	19	1481.5
Mayurbhanj	13	2254
Koraput	7	156

Long term objectives of reducing poverty and conservation of biodiversity in Orissa, therefore warrants policies enabling on integration of optimal harvest limit of NTFPs and establishing its adequate marketing. This aspect is further explained in the next chapter.

4.4. Discussions

Orissa has been a pioneering state in evolving community based forest management systems, Some of the villages started as early as 1950-55 (Kant *et al.*, 1991; Ravindranath *et al.*, 2000; Conroy *et al.*, 2002). Such practices are concentrated in Dhenkanal, Mayurbhanj, Koraput and Sundergarh districts. In Mayurbhanj, the presence of CFM is wide spread. There are 2509 CFM groups/villages spread in the entire state according to the survey undertaken by the Directorate of Social Forestry in 1999, with the first CFM traced back to the pre-independence era in Lapanga village of Sambalpur district (Pal, 2000; Rath, 2002). But, this at best, is a conservative estimate, as was found during the current study.

Despite the trends of decrease in total forest cover over the years in the State, the CFM patches have shown better regeneration and stocking of trees (Rath, 2002). This, because of a strong sense of ownership exists among the communities, as they are the ones who have grown the forest from degraded land and also due to the demonstration effect as shown in Fig. 4.4 & 4.5. This is the reason why at many places the communities do not want to partner with the Forest Department. Here again the responses of the communities vary from place to place due to socio-cultural-ecological reasons. In case of the Kandhamal district, where the population is comparatively homogeneous in terms of community composition, i.e., mainly dominated by Kandhav tribes, the horizontal expansion/replication of the practice becomes autogenous. It is also important to mention here that the relation between the State Forest Department officials and the community is very variable as exemplified by Nayagarh and Mayurbhanj in the formation of federations. In the first case it is very antagonistic, whereas in the second case very cooperating.

There has been a lack of studies involving statistically designed surveys to furnish reliable estimates of number of CFMs and produce documentary evidence of their impact on the forests. In absence of these, the CFM might not have been given due attention by the Govt., specially the FD. The present study provides, for the first time, quantitative and qualitative aspects of CFM phenomenon using statistically sound techniques. It is, therefore, important to highlight the following points in this context.

- Significance of survey method / results
- CFM vs. JFM controversy
- CFM in the context of sustainable development

Significance of the Survey Method

Discussions on the self-initiated community forest management in Orissa have tended to become polarized between two extremes. While one side claims about the betterment of forest conditions associated with the community protection, the other side talks about the alleged degradation of the adjoining public forests caused by the same communities. There was a need therefore not only for a comprehensive enquiry on the subject, but also to produce documentary evidence in form of images to show the ground realities. But, this might not have been sufficient either, because an overlay and interpretation of at least two date images would be necessary to establish positive or negative trends associated with community protection. A further challenge was the need for an overlay of change map over village boundaries to attribute forest changes with villages.

An intriguing fact was the non-availability of a list of CFM villages or forest maps for the study areas even after persistent efforts lasting through a year. The list, which we finally got, turned out to be only

half complete. All these cases point towards the need for using statistical methods to select sample villages, as was done by us during the second phase of research. The methods of field survey, image interpretation and village level GIS were all combined to provide a complete package for the study of dynamic forest changes associated with CFM.

The method of multi-date remote sensing, using interdependent image interpretation procedure as used by us, was developed by FAO Forest Resources Assessment 1990 and applied over the entire tropical zone on a sampling basis at 117 locations. A visual technique of image interpretation was used (FAO 1996). In the present case, digital interpretation method was employed using 1:50,000 topographic maps as control. As the demand on accuracy was very high and results were to be integrated with forest changes at the village level, the interpretation was combined with intensive ground truthing. The results achieved were adjudged quite satisfactory and hold promise for future large-scale applications.

Significance of the Survey Results

There has been also a complete lack of studies to provide an infallible evidence of ground realities. Using statistical sampling, coupled with remote sensing, the results formed a sound basis for discussing CFM with the Forest Department. Some of the NGOs had written earlier on CFM, but in the eyes of the Forest Department, the NGO results were considered biased, lacking in proper survey design. The Forest Department always firmly asserted that the community, while protecting their own patches, was systematically destroying forests outside. The uses of multi-date remote sensing survey, however, soon revealed that the CFM practices on a whole have contributed to an increase in the forest cover, making the system effective and self-sustainable. It was for the first time that Forest Department accepted the CFM's significant contribution in conserving the forest resources.

It has already been pointed out as to how the use of multi-date remote sensing helped in revealing many more CFM than documented by the NGOs. Part of our fieldwork was also to know the awareness and responses of the communities on VSS. The responses were mixed on different aspects of JFM. Whether the people's participation towards conservation is community driven or not is evident as there were only 30% of those sampled villages in Kandhamal, which signed VSS benefited in terms of enjoying symbolic rights over the patch of forest for protection. This has helped them to protect it from the onslaught of other adjoining villages. There are also instances where communities expressed that the VSS committee is formed in haste involving a select few, all of them the forester's choice. In case of Mayurbhanj, some villages expressed their willingness to join VSS mainly for two reasons: (i) Symbolic "exclusive" right over the patches, to protect from other villages (ii) In anticipation of Forest Development Agency (FDA) support, which could develop the village.

CFM vs. JFM in the Context of Sustainable Development

From the evaluation of CFM involving different tools and techniques using social, ecological and economic indicators, it is inferred that the full potential of CFM towards poverty alleviation has yet to be fully realized by the local communities and the Forest Department. CFMs as institutions in Orissa operate at different scale in terms of their spatial dimensions and rules pertaining towards management. The trend towards federation and cluster formation holds immense potential for value addition and marketing of its product. The community's capacity to organize for the same is not reflected in managing these federations as in forest protection. The critical review by OXFAM also reveals that these institutions have proved to be

effective towards protection but not towards enhancing the livelihood. This is also partly because of digressing views on the potential and recognition by the Department.

Forest is one of the important components of livelihoods, especially for the poor living on the forest fringes. From the Table 4.10, 4.11 & 4.12, the importance of level of organization of the community towards forest protection, availability of forest cover and their abilities to process and market the products are recognized as equal important and interrelated component in overall framework of sustainable livelihood.

Though the objectives under CFM and JFM remain the same, i.e, sustainable management of forest resources, there is difference in approach towards their implementation, especially with respect to sharing of benefits and accountability. The JFM is project based and therefore its successful implementation depends upon the funding and attitude of the implementer (i.e., the concerned officer). This is the reason for active JFM in Andhra Pradesh as it has financial support from the World Bank. Contrary to that, the awareness towards the JFM program in Orissa is neither very active nor it is well accepted by the communities. Besides, the role of communities and the State in the management of forest has been contested over many years. There exists enough historical description on the conflicts between the two over the tenure and use rights.

Through CFM, we can increase the social capital of the communities that is important for successful implementation of any development program. Most of the developmental schemes/programs fail because they aren't in tune with the available social capital. This is self evident, when we see the trends on forest cover of the three chosen districts (Fig. 4.3).

Integration of conservation and development goals is constrained by a lack of fit between the institutions and ecosystems, and between sets of stakeholders (Brown, 2003). Innovative institutions based on adaptive management, as well as more equitable and inclusionary decision making need have to be created. The bottlenecks need to be removed by integrating different stakeholders and communities to work on the suggested Conceptual Model as described in the following chapter. As shown earlier, the potential of forests and NTFPS contribution to overall tribal economy is immense and not yet fully realized by the tribals and concerned stakeholders of the tribal development. The need of the hour is therefore, scientific management and adequate marketing mechanism of NTFPs. This includes the identification of optimal harvest regimes, the accurate estimation of maximum harvest limits, adequate processing and marketing, and the implementation of those by local harvesters.

Some conclusions drawn from the present study are:

- The loss of forests has led to misery and hardships among the tribals, and, similarly, gain of forests to tribal prosperity and social rehabilitation.
- CFM not only contributes towards forest conservation but also to social, cultural and institutional development in the tribal areas
- CFM is definitely a better option for forest management as compared to JFM provided official support is provided to the movement as it has been done in the case of JFM.
- Forests have high potential to enhance economic and social development, besides contributing to ecological well being of the present and future generations.

Chapter 5

A SYNTHESIS OF FINDINGS AND FUTURE DIRECTIONS

5.1. Introduction

The study was conceived in the context of forest based sustainable development with special reference to the Central Zone of India, which has nearly 40% of the forest area and nearly 90% of the tribal population of the country. Majority of these people are living in the forest fringe, within 5 km distance from the forest, more or less, in social exclusion. The incidence of poverty among them is very high, the income poverty being 51% compared to the all-India estimate of 39%. For the gatherers and wage earners, who constitute the majority of the population, the figure is as high as 68%. In respect of other human development indicators (literacy, health, vulnerability, etc.), the score was the lowest among all groups in the country (NCAER, 1999).

By the end of the last Millennium, the country had well secured the foundations for rapid economic growth: Overflowing granaries; the infrastructure sector on the upswing; a vast pool of trained human resources; domestic saving and capital formation showing healthy growth; an impressive network of development institutions and rapid strides in technological development (NCAER 1999). None of these can be said to have happened in the tribal areas.

Both geographic location (distance from the market) and ecology are the contributing factors to slow development, and make the tribal economy land and forest based. The hilly and inaccessible nature of the terrain, where the tribals live, makes investment in genetically improved seed, irrigation and fertilizer unviable. It is almost certain that the tribals would stay poor, if they continue to remain dependent on agriculture and the forest resources. It seems almost impossible to enhance the economic growth in the tribal regions based on the land sector, which is relatively slow growing with the population rising between 2-3% annually. An equally important issue is the type of development, which the people aspire for. In this respect, the emphasis needs to be placed not only on economic but all round human development including social, cultural and ecological.

5.2. Research objectives

The long-term objectives of the research were alleviation of extreme poverty among the forest fringe dwellers and conservation of biological diversity. The immediate objectives were: to study the strengths and weaknesses of alternative forest management systems from technical, ecological, social, economic and capacity building perspectives, and to investigate organizational and institutional means to make forestry an effective instrument for sustainable rural livelihood.

The following three forest management options were examined in different political, economic and social situations:

- State Forest Management (SFM)
- Joint Forest Management (JFM) and
- Community Forest Management (CFM).

In relation to Joint Forest Management System, the hypothesis under test was that: “the current JFM system is only a half step towards the sustainable development of the community living in the forested regions. A complete step would combine forest management objectives with enterprise development and capacity building to achieve the combined goals of Sustainable Forest management / Sustainable Rural Development in the forested regions”.

5.3. Methodology

The methodology of remotes sensing, GIS and field inventory developed by the project is an important scientific contribution to monitoring of the forest cover and planning of development at the village level. By virtue of statistical soundness, the use of remote sensing and GIS techniques, the project has provided convincing results making it easy for the Government / Policy Makers and State Forest Department to accept and maybe implement them.

5.4. Review of findings

The strengths and weaknesses of alternative systems of forest management were observed as follows.

5.4.1. State forest management

The history of “reserve” and “protected” forests, in the late 19th and early 20th century, is characterized by dispossession of forests and lands from the princely states and their transformation into “reserved forests” with a near-total curb on all local rights with the objective to produce high value timber on a sustainable basis. By the end 1946, the state controlled forest area was around 46 million ha (Pouchepadass 1990, Gadgil and Guha 1992, Buchy 1993, Kant and Berry 1998, Rangachari and Mukherji 2000).

A strict system of forest management was introduced in the “reserved forests” including a moratorium on felling and control on fire and grazing and working according to a plan. There was, however, no effort, to promote forestry outside the limits of reserve forests on a sustained basis. As a result, by the time of independence, the forests fulfilling community needs had already disappeared or were left behind in a heavily degraded condition.

In the post-colonial period, the objectives and style of forest management remained more or less unchanged. According to National Forest Policy, 1952, “National Forests constitute the basis of India’s wealth, for they comprise valuable timber bearing regions, the produce of which is indispensable for defence, communication and vital industries. The scientific consideration of forests invariably involves the regulation of rights and the restriction of privileges of the user, depending on the value and importance of the forest, however irksome such restraint may be to neighbouring areas”. Such policies are very authoritative and non-participatory for a democratic system and bound to alienate local communities from the forests.

The above comments apply to all sectors and not only to forestry. According to Rangachari and Mukherji (2000), “the post-Independence administration has merely continued from where the colonial government had left. It can be plausibly argued too that the new administration has introduced complexities not only in forest management or the role of the tribes with reference to their habitat, but also the relationship of the citizen to the government. It has done this by introducing a multiplicity of functions and jurisdictions without any real or effective local self-government. In the process, matters have become complicated for the citizen owing to a proliferation of sub-departments with functions pertaining to a narrow focus.”

The National Forest Policy of 1988 marked a watershed in the history of forestry of the country by declaring the local populace as the protectors and partners in forest management and setting aside a major share of benefits for them. It accepts that “forests in the country had suffered serious depletion due to relentless pressures arising from ever-increasing demand for fuel wood, fodder and timber; inadequacy of protection measures; diversion of forest lands to non-forest uses without ensuring compensatory afforestation and essential environmental safeguards; and the tendency to look upon forests as revenue earning resource.” This retrospection gave birth to a more participatory form of forestry called joint forest management in 1992.

5.4.2. Joint forest management

According to Joshi (2000), the beginning of JFM thinking around 1975 (in West Bengal) was the realization by the forest officials that it is impossible to protect and regenerate forests without people’s support. According to the author, “JFM represents a case of the forest bureaucracy acting in an innovative, non-self-interested fashion, at some cost to its own power with the motivation to arrest the forest degradation.”

Rangachari and Mukherji (2000) also attribute the origin of JFM “to foresters - even if it meant the surrender to the stakeholders of many aspects of the state’s ownership. There are also indications that as forest staff gradually shed their inhibitions and draw closer to the people who use the resources - people who the foresters wanted to drive out at all costs - they began to realize that the seemingly impossible task of forest protection was increasingly in safer hands”. Thus, the evolution of JFM and foresters’ perspective to it seem to be guided from considerations of forest protection.

The restoration of the rights to local stakeholders, so far limited to protection and benefit sharing only, would suggest that the wheel has turned full circle. But, according to Rangachari and Mukherji (2000), “history teaches us that while institutions may be revived, the conditions in which those institutions performed effectively cannot always be recreated. In this sense, the present change, from a state-owned, state-managed and state-appropriated resource use paradigm, to one that is still state-owned but largely community-managed and community -appropriated (under state supervision), must be viewed as incremental and transitory”.

In spite of reported progress towards JFM, an assessment by Forest Survey of India shows that deforestation in tribal districts increased from 103, 800 ha during 1993-95 to 489,900 ha during 1995-97 (FSI 1998, Khare *et al.* 2000). It is important to take cognizance of such events and study their causes, because tribal population in general is reported to be forest friendly.

Rangachari and Mukherji (2000) and Vedanand (2000) see future JFM as a means to poverty alleviation in India as a part of integrated land use, in which agriculture, pasture and plantation are all fitted in as complementary activities in an area unit. Fruehling and Persson (1993), drawing lessons from the forest history of Sweden, state that “it is time to start the journey back to national realities, focusing on people and how to improve their living conditions through a sustainable co-existence with nature.”

In the long run, the key indicator to measure the success of JFM would be how it is giving ‘voice’ to the poor, reducing opportunities for rent-seeking through greater transparency, and generally regulating the intrusion of the market into a predominantly subsistence mode of living. NGOs and networking and

building of local institutional capacity at the grassroots level will be most critical. The building of overall social capital seems to be a necessary condition for the success of JFM.

5.4.3. Community forest management

The effort made by the communities in Orissa to regenerate forest of their own initiative, mostly on degraded revenue lands, is laudable. The criticism is equally valid that communities, while regenerating and protecting forest patches under their control, are exploiting other forest areas. This is mainly because the forest patches, under community control, are limited in size and cannot meet the entire village requirements on a sustainable basis. If communities have to become self-reliant in their requirements of forest produce, mainly the firewood and fodder, they must increase the extent of forest and improve its productivity. The challenge to forestry lies in producing fuel, fodder and small timber to meet the current community needs with the full cooperation of the community. It is refreshing to find that most of the village communities, visited during the study, were convinced about the production and environmental functions of forests. Therefore, the Forest Department may find it easy to develop a new strategic partnership with the locals, where optimum use is made of the social capital in protection as well as regeneration of forest resources, in all areas not suitable for intensive agriculture, and planting tree resources even in the agricultural lands.

As a result of their non-participation in the CFM movement, the forest departments are losing much of their control of forests and public sympathy. In some of the forest ranges, the department alleges increased illegal flow of timber by the forest mafia is in connivance with the local communities. Thus, it is very difficult to stave off or reduce the flow. Furthermore, the absence of incentives and security for frontline staff to risk their lives and extreme poverty compelling them to meet their biomass needs compounds the problems.

CFM presents a model of development, where the community is able to reach a higher level of social, economic and environmental well being. This is one of the prime reasons for the villagers in Nayagarh and Buddh Khamari federation not to join JFM (VSS) despite lucrative incentives offered to them by the FD. In addition, in the process of evolution of these institutions from village level to federation level, people have developed/acquired confidence on the efficacy of their institutions and enhanced bargaining power in form of market prices and conserve their resources against external criminals. Social component in the CFM makes it distinct from JFM/SFM.

5.5. A forest based development paradigm

From the evaluation in Orissa, it is obvious that the full potential of CFM towards poverty alleviation (and human development) has yet to be realized by the communities themselves and the Government. It may be noted that sustainable management of NTFPs is closely connected with empowerment and local development. This has been the main message from UNCED 1992, which placed emphasis on capacity building, governance, human resources development, etc. Keeping this in view, Figure 5.1 presents a vision (paradigm) for NTFPs based sustainable development. The model presented is general and includes all issues related to development in tribal areas.

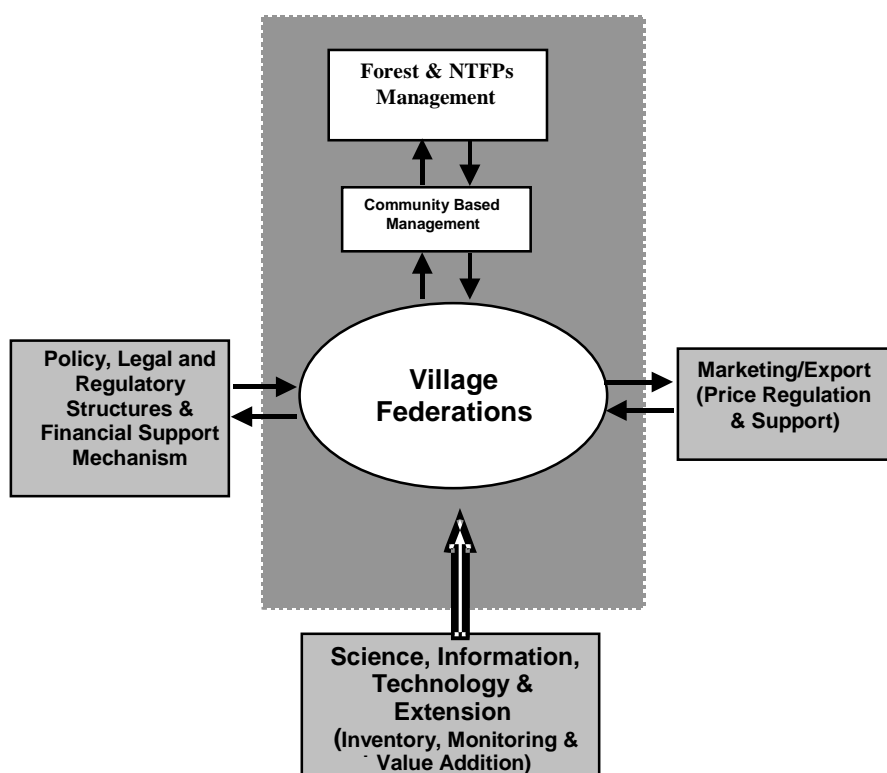


Figure 5.1: A conceptual model for management of NTFPs and forest for sustaining livelihood and long-term conservation

Local Empowerment and institution building (in Fig. 5.1 the central large rectangle)

In the proposed scheme, community assumes the central role in steering all of the development process (see the large rectangle in Figure 5.1) and government as the provider of the extension and support services including:

- Development of local institutional and organizational capacity to undertake development planning and mobilizing local and external resources; provision of health care, drinking water and education;
- Establishment of councils/cooperatives for protection and management of existing forests; creation of new (commune owned) forests in deforested and degraded lands to meet their current and future needs;
- Decentralization of the decision making structure to local level; setting mechanism for inter-departmental cooperation and promoting participation of NGO and local people in the decision making process; recognition of the value of local production systems and cultural diversity.
- Promotion of local processing of forest-products and their marketing through village cooperatives; development of partnership with private sector and NGOs.

Supporting role of the government (the three side rectangles in Figure 5.1)

- Establishment of legal, regulatory, conflict resolution and enforcement structures for the management of forest and common land resources; mechanism to redirect a part of revenue to the local community from the management of forests and to compensate them for the loss of revenue due to closure of area for regeneration or other technical reasons;

- Organization of science, information, technology and extension (SITE) services to support planning, monitoring and evaluation of forestry development and poverty alleviation programs and periodic reporting on the state of poverty, progress achieved and constraints in the way;
- Marketing, processing and value addition: In case of NTFPs, there is market failure as well as institutional failure. There are possibilities for private-public-partnership (PPP) in cultivation, processing, value addition and marketing of timber as well as non-timber forest products.

The findings and recommendations show that people and government working hand in hand would be able to make rapid advancements in alleviating extreme poverty in the tribal region and conserving biological diversity - two aspects that often seem to exclude each other.

References

- Brandis, D.** 1897. *Forestry in India: Origin and Early Development*. Natraj publication, Dehradun.
- Brown, K.** 2003. 2003. Integrating conservation and development: a case institutional misfit. *Front. Ecol. Environ.* 1 (9): 479-487.
- Buchy, M.** 1993. *British Forestry in the Western Ghats (India) and French Forestry in Indochina: A Comparison*, French Institute, Pondicherry, India.
- Census of India**, 2001. Director of Census Operations, Orissa.
- Conroy, C., Mishra, A. and Rai, A.** 2002. Learning from self initiated community forest management in Orissa, India. *Forest Policy and Economics*, 4: 227-237.
- ENVID**, 2000. *Impact Assessment of JFM in Vishakapatnam Forest Division for AP Forest Department*, Department of Environmental Science, Andhra University, Vishakapatnam.
- FAO**, 1997. *Land use and forest cover change in East Godavari catchments of Andhra Pradesh. A study implemented in the framework of country capacity building in forests resources assessment projects*. FAO, Rome.
- FAO**, 1996. *Forest Resources Assessment 1990: Survey of Tropical forest Cover and Study of Change Processes*. FAO Rome, Italy.
- Forest Survey of India (FSI)**, 1991. *State of Forest Report 1991*, Forest Survey of India, Ministry of Environment and Forests, Dehradun.
- Forest Survey of India (FSI)**, 1993. *State of Forest Report 1993*, Forest Survey of India, Ministry of Environment and Forests, Dehradun.
- Forest Survey of India (FSI)**, 1995. *State of Forest Report 1995*, Forest Survey of India, Ministry of Environment and Forests, Dehradun.
- Forest Survey of India (FSI)**, 1997. *State of Forest Report 1997*, Forest Survey of India, Ministry of Environment and Forests, Dehradun.
- Forest Survey of India (FSI)**, 1999. *State of Forest Report 1999*, Forest Survey of India, Ministry of Environment and Forests, Dehradun.
- Forest Survey of India (FSI)**, 2001. *State of Forest Report 2001*, Forest Survey of India, Ministry of Environment and Forests, Dehradun.
- Fruhling, P. and Persson, R.** 1993. *Back to National Realities*, SIDA, Sweden.
- FSI**, 2001. *State of Forests Report 2001*.
- FSI**, 1998. *Forest Cover in Tribal Districts of India*, FSI Dehradun, India.
- FSI**, 1996. *Fuelwood, Timber and Fodder from Forests of India*. FSI, Dehradun.

- Gadgil, M. and Guha, R.** 1992. *The Fissured Land: An Ecological History of India*, Oxford University Press, Delhi, India.
- Gandhi, M.K.** 1966. *The Village Reconstruction*. Bhartiya Vidya Bhavan, Bombay.
- Jones, J. E.** 1999. Poverty, land care, and sustainable livelihoods in hillside and mountain regions. *Mountain Research and Development*. 19(3): 179-190.
- Joshi, A.** 2000. *Roots of Change: Frontline Workers and Policy Reform in West Bengal*, unpublished doctoral thesis from MIT Archives.
- Kant, S. and Berry, A.** 1998. *Path Dependence, Multiple Equilibria and Adaptive Efficiency Forest Regimes of India*, Toronto University, Canada.
- Kant, S., Singh, N.M. and Singh, K.K.** 1991. *Community Based Forest Management Systems (Case Studies from Orissa)*. IIFM, Bhopal; SIDA, N.Delhi & ISO/Swedforest, New Delhi.
- Keay, J.** 2000. *India A History*. Atlantic Monthly Press, New York.
- Khare, A., Sarin, M., Saxena, N.C., Palit, S., Bathla, S., Farhad, V. and Satyanarayan, M.** 2000. *Joint Forest Management: Policy, Practice and Prospects*, World Wide Fund for Nature, India.
- NCAER**, 1999. *India: Human Development Report*. Oxford University Press, New Delhi.
- Pal, S.K.**, 2000. Community based forest management (CM) in Orissa; a new way forward. *Forests, Trees and people*, Newsletter No. 42, 62-68.
- Pouchepadass, J.** 1990. *The ecological history of the Central western Ghats in Modern period: a Preliminary Survey*. French Institute Pondicherry, India.
- Rangachari C.S. and Mukherji S.D.** (2000). *Old Roots New Shoots, A study of Joint Forest Management in Andhra Pradesh*, FORD Foundation, New Delhi.
- Rath, B.** 2002. *People-Forest-State: A Statistical Review of the Triangular Relationship in Orissa*. Vasundhara, Bhubaneswar.
- Ravindranath, N.H, Murali, K.S. and Malhotra, K.C.** 2000 (ed). *Joint Forest Management and Community Forestry in India: An Ecological and Institutional Assessment*. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
- Sahu, N.C. and Das, B.N.** 1997. Forest policy in Orissa: A third visit. In: Mohapatra, P.M. and Mohapatra, P.C. (eds), *Forest Management in Tribal Areas*. Concept Publishing Company, New Delhi, pp 43-57.
- Samata**, 2001. *Joint Forest Management: A Critique Based on People Perceptions*. Samata, Hyderabad & CRYNet, Vishakapatnam.
- Singh, K.D. and Marzoli, A.** 1996. *Forestry in India: Yesterday, Today and Tomorrow in the framework of country capacity building project in forest resources assessment*, FAO Rome, Italy.
- Singh, R.V.** 2001. Contribution of participatory forest management in the livelihood of rural communities in India. *Forests, Trees and Livelihoods*, 11, 159-166.

Statistical Handbook of Orissa, 1987. Govt. of Orissa, Bhubaneswar.

TERI, 2000, National Study on Joint Forest Management, Tata Energy research Institute, Delhi.

The New Encyclopedia Britannica, 1980. Encyclopedia Britanica Inc., Chicago, pp 609-614.

Vedanand, 2000. Strategic Perspective on poverty Reduction in India; An Action Agenda, Personal Communication.

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