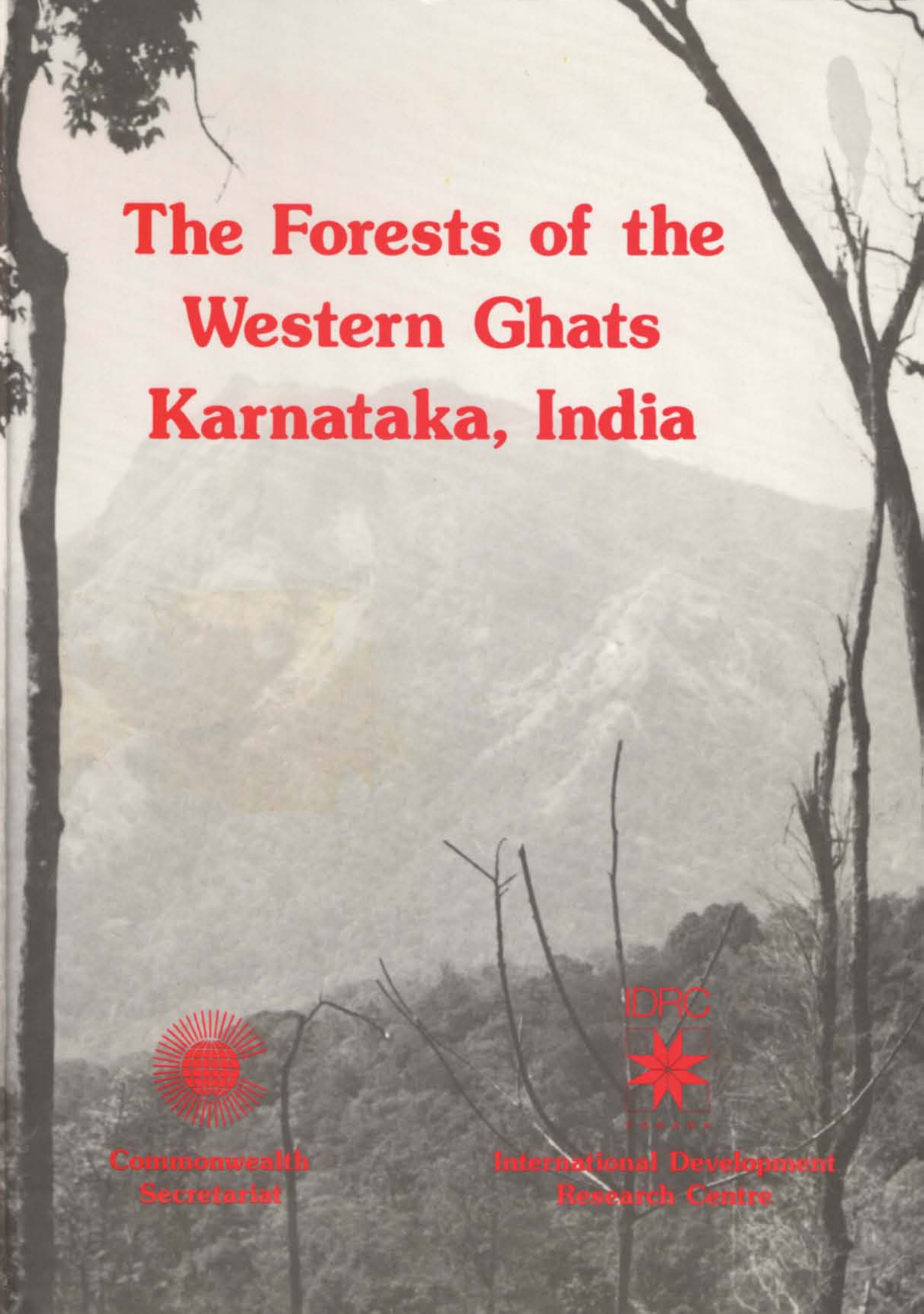

The Forests of the Western Ghats Karnataka, India

Commonwealth Secretariat

International Development Research Centre

The Forests of the Western Ghats Karnataka, India

A History of Forest Management

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PREFACE

This report is the first in a series to be published by the Commonwealth Secretariat within the next year. Each volume will trace the development of tropical forest management in a Commonwealth country, to illustrate the range of experience and knowledge that has been gathered during the past century and more of Commonwealth forestry. Forest management is no longer the concern of foresters alone, and the fate of the tropical forests is increasingly dependent on the understanding of interested people outside the profession, especially environmentalists, politicians, social scientists, the general public and the media. This series is intended to assist a wider understanding of the historical basis to the new directions and policy initiatives now being taken in the countries concerned.

The series of reports is the first step in the Commonwealth Forestry Initiative (Kemp, 1992) intended to provide more productive links, not only between past experience and modern concerns for forest conservation, but also among countries actively developing new programmes in natural forest management. It is hoped that the next step will be supported for study visits and scientific exchange, as part of a coordinated programme, centred on selected demonstration, research and development areas in a number of countries.

The origins of professional management in the Western Ghats in Southern India can be traced to the early part of the last century. Having been at the forefront of the earliest attempts at tropical forest management, India is now pioneering new approaches to resolve the competing economic, social and environmental demands on the remaining areas of forest. As the author of this study suggests, the innovative approaches needed to meet the pressures from increasing human and livestock populations on the severely reduced forests are not only advances in technical aspects of forest management but involve foresters in assisting local communities in broader aspects of the rural economy. Mr. Shyam Sundar, formerly Principal Chief Conservator of Forests in Karnataka State, has brought to the subject his long experience as a distinguished member of the Indian Forest Service, and has provided a detailed bibliography to assist others in future studies in these forests.

A second volume, on Uganda, is in draft, and this will be followed by accounts of experience in tropical forest management in Ghana, and in Queensland, Australia. The work has been funded by the Commonwealth Fund for Technical Cooperation (CFTC), and this first volume was made possible by funding provided by the International Development Research Centre (IDRC), of Canada.

Brian Kerr
Commonwealth Secretariat
August 1993.

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Photographs

The photographs were supplied by the author and colleagues Mr. S.G. Neginhal and Mr. N.C.S. Murthy. We gratefully acknowledge permission to use these photographs. The cover photograph shows Reserve Forest on the lower slopes with forested middle slopes and exposed rock on the peaks.

FOREWORD

A century ago, the first National Forest Policy of India (1894) classified the forests as firstly protection forests, required to be preserved for ecological reasons, secondly economic forests for meeting the timber and industrial needs of the country or thirdly forests in and around the villages, to meet the needs of local populations. The Royal Commission on Agriculture (1928) suggested two divisions in the Forest Department; one to manage the first two categories of forests for the country's needs and the second for forests intended to benefit the local villagers.

Now, in 1993, the most frequently discussed subject in forestry circles in India and other parts of the world is Joint Forest Planning and Management (JFPM). The idea is to work the forests subjected to biotic pressure, with the people as partners, while providing them with a share of the benefits. There is therefore a strong sense of a return to older ideas. However the third category forest referred to in the 1894 Forest Policy Statement and by the 1928 Royal Commission on Agriculture, the "Village Forests" have either been brought under the plough or totally decimated. The JFPM areas of today are the Reserve Forests and not the community privilege forests of past years.

The Reserve Forests are the areas from which the people were barred by law but could not be kept away in practice. The JFPM premise thus flows from an acceptance of the need to adapt to the present realities, through multiple-use under collaborative management.

I have been a forester for four decades and a witness to these changes. I am grateful to the Commonwealth Fund for Technical Co-operation for providing the opportunity to record these observations and I acknowledge the help of many former colleagues.

S. Shyam Sunder
Bangalore

1. THE WESTERN GHATS IN THE STATE OF KARNATAKA

1.1 Introduction

Karnataka in many was epitomises the diversity of India. Karnataka State was formed in 1956 by the merger of Kannda speaking areas of the Bombay and Madras provinces,the princely State of Hyderabad, the whole of Mysore State and the centrally administered State of Kadagu (Coorg). Covering a land areas of some 190,000 square kilometres, it is an important state in Southern India with the city of Bangalore as capital. It has a coastline of 400 kms and a seaboard, 10 to 80 km wide, which has had trade links with the outside world for more than a thousand years. Next to the coast a continuous mountain range, 30 to 80 kms in width, rises to a height of 1,800 meters, declining gently to the east to a plateau some 100 m. above sea level. While in the west the rain is in summer in the north east it is in winter. Agumbe in the mountain belt receives over 7,500m rain, and there are places in the north east parts with less than 250m. While we have the Tropical Wet Evergreen forests in the mountain range, we also have, in parts around Bellary, arid conditions, similar to desert.

1.2 Geology and Topography

Along the river banks, in holy places in India, steps are formed to facilitate bathing. These are known as 'ghats'. The mountain belt, known in Indian epics as Sahyadri, running parallel to the West coast of India over a length of 1,600 kms. (1,000 miles) is called the Western Ghats, in allusion to the step formation in the northern half. This has resulted from differential erosion of the layers of lava and ash. In Kannda, the local language, the Western Ghat belt is know as Malnad or mountain region.

The geology of the Karnataka Western Ghats is Pre-Cambrian, among the oldest in India. Rocks are gneiss with intrusions of granite. The soil is generally lateritic, hardening on exposure, a factor of considerable significance relative to land use practices.

The forests occupy the interior tracts of the coastal plain, the foot of the ghats and the mountain range, which rises as a wall, with quite often vertical slopes. East of the crest the gradient becomes less steep and the topography undulating with locally small areas of steep terrain.

1.3 Climate

The climate is typical of the tropics with heavy rain received during a short period of the year when the temperature is also high, resulting in humid conditions. A few strong pre-monsoon showers in April and May accompanied by thunder and lightening precede the regular monsoon. The monsoon lasts barely for 15 weeks, during which period more than 90% of the annual rain is received (Ministry of Works and Housing 1982). This is the feature in the entire area, varying only in degree of intensity. By and large, the minimum temperature does not fall below 12°c and the maximum may reach even 45°c at the canopy level (Rai 1990). Rainfall decreases rapidly away from the coast due a rain shadow effect in parts falling from 7500 mm to 750 mm in 50 kms.

1.4 Forests and Vegetation

Within an area of 20,000 sq kms. there are four main forest types and twelve sub-types as classified by Champion and Seth (Tiwari 1993). The main types are:

a. Southern Tropical Wet Evergreen Forest
b. Southern Tropical Semi-Evergreen Forest
c. Tropical Moist Deciduous Forest
d. Tropical Dry Deciduous Forest

In addition to the sub-types, there are distinct degradation stages and stages of serial succession providing a bewildering biodiversity.

The importance of biodiversity for the future of mankind cannot be overstressed. The survival and well being of a large fraction of today's human population depends crucially on a number of antiobiotics and anti-cancer drugs provided by obscure plants and animals. Yet in harnessing their benefits, we have only made a beginning. No more than 2% of the flowering plants have been screened for useful alkaloids (Chandrashekar undated).

Of the 13,000 species of higher plants recorded in India, about 27% or 3,500 species occur in the Western Ghats. Many more species will become known when a systematic survey is undertaken. There are 58 endemic genera mostly confined to the Western Ghats (Abraham 1984). These forests are centres of progenitors or relatives of many cultivated plants e.g. rice, banana, turmeric, pepper, cinnamon and cardamom. It is a centre of genetic diversity for orchids (Chauhan 1993). It is the home of mango with over 100 identified varieties in the wild (Reddy 1993). The value of drugs obtained from, herbs and plants in the Western Ghats is put at Rs800 million per annum (MWH op cit).

1.5 Wildlife

The Western Ghat region is extremely rich in wildlife. The area is the home of the Asian elephant whose migratory movements cover the Dry Deciduous and Moist Deciduous forests, with infrequent forages into the Semi-Evergreen and Evergreen Forests. Bison (Bos gaurus) and Sambhar (Cervus unicolor) have a similar range while Spotted Deer (Cervus) is confined to the Deciduous Forests. The companions of Spotted Deer, in lesser numbers are the Barking deer (Mutiacus muntjac) and Mouse deer (Tragulus meminna). Tiger, considered to be at the apex of the wild life community, occurs in reasonable numbers in the Deciduous Forests while Panther is present in larger numbers. Hyena and Jackal frequent the outer limits of the forests and Wild Dogs, though in lesser numbers, are encountered in the entire region. Jungle Fowl are common in the wetter areas and Pea Fowl prefer the drier parts.

1.6 Water Resources

The Western Ghats gain elevation rapidly in the west presenting a high escarpment almost parallel to the coast. This causes the heavy moisture laden monsoon winds to part with a major share of their moisture on the western slopes of the ghats. The areas east of the crest receive significantly less rain and are rain shadowed. There are therefore a large number of west flowing rivers with short courses while the east flowing rivers, are fewer in number. The major irrigation projects in Karnataka, Andhra and Tamil Nadu depend on the catchment areas of the ghats.

The swift flowing western rivers, which lose height of around 1,300 to 1,500m. in a short distance before joining the sea have very high power generation potential. The installed capacity of hydel projects in the State at present is 2310 MW (Rudrappa 1993).

1.7 Agriculture and Horticulture

The zone with its characteristic features of high erodability of exposed lands and poor moisture retentive capacity is not ideal for agriculture. Despite this a quarter of the land area is under the plough. Irrigation is available in barely 125,000 ha. The major agricultural crops are paddy rice, ragi (a coarse millet), horsegram, and groundnut (Agriculture Finance Corporation 1992).

In the sphere of horticulture, arecanut from palm trees is important in the northern districts while coffee is important in the south. Amongst the States in India, Karnataka leads in production of coffee and areca and second in cardamom and pepper, all cultivated in the Western Ghats (Agriculture Finance Corporation 1992).

Coffee was introduced in the Western Ghats in 1670. (Buchanan - Hamilton, 1807). The cultivation of coffee, in estates, was encouraged by the British beginning in 1870. In the old Mysore parts of Western Ghats, Government land suitable for coffee was classified separately and made available through grants for its cultivation. In Kodagu, land was freely made available for the purposes of coffee cultivation from community privilege areas (Someshwar 1991).

1.8 Land Tenure

Individual Privilege Areas

Individual privilege areas are forests outside reserve forest and attached to agricultural land or horticulture gardens for benefiting cultivated crops, mainly for providing mulch. Grants of forests were liberally made in the past for privilege purpose. In Uttara Kannada district, the privilege area for areca was up to eight times the extent under areca. In Kodagu areas up to 300 acres were allocated. Privilege areas are found in all parts of the State in the Western Ghat belt and are known by a variety of names such as 'betta'. The very purpose for which the privilege is granted, for lopping, guarantees degradation of trees and forest cover in these areas.

Community Privilege Areas

Prior to reservation of forest, the land belonged to the Revenue Department. Hence, the Forest Settlement Officer who conducted the reservation, was from the Revenue Department. At the time of reservation, an essential criterion investigated by the Forest Settlement Officer was the extent of forest land available outside the reservation areas (Cleghorn 1861, Stebbing 1921). These lands are intended to meet the local needs of small timber, firewood and fodder. Community privilege areas in the malnad belt were equal in extent to the reserved blocks (Shyam Sunder and Parameshwarappa 1987). The Royal Commission on Agriculture in India (1928) had suggested that there should be two divisions within the Forest Department. The first for managing protection forest, preservation of which is desirable on climatic or physical grounds and also commercial forests. The second for managing minor forests, fuel plantations, village woodlands and such areas classified as waste land or unclassed forest. This indicates the extent of the second category of land with tree cover during the period.

1.9 Contribution of the Western Ghat Forests to the People

The importance of the forests in the Western Ghats to society at large has been aptly described as follows:

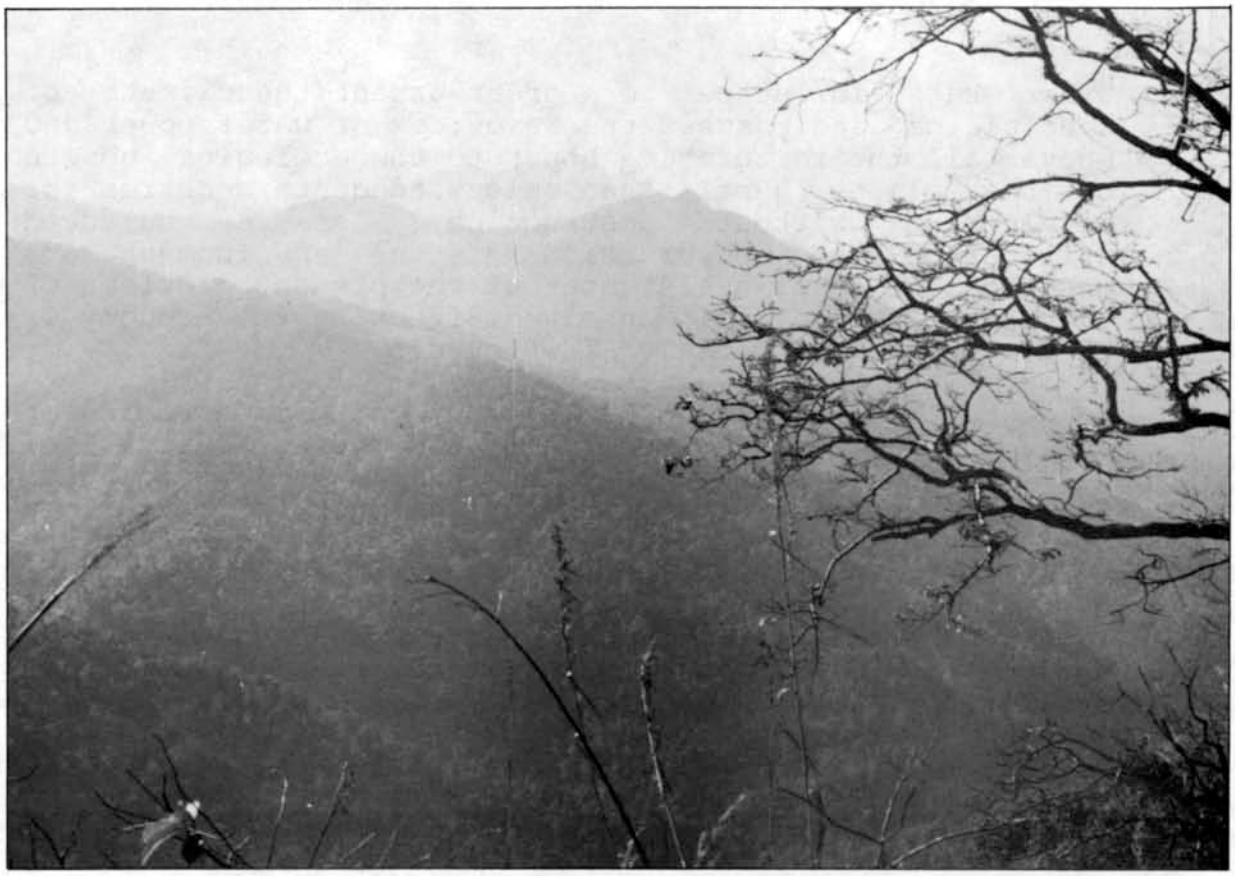
"The Ghats influence to a great extent the climate of the plains and possess the resources of water power and above all the restorative hopes to the ecological upsets of the plains. Until and unless adequate measures for development without destruction, for a balanced utilisation and conservation of the environment are ensured in these hills, most of the present problems of the plains will remain unsolved affecting the economy of the entire area adversely" (MWH op cit).

In rural India firewood is the most common source of fuel, used as a nonmonetised item; as a result 90% of all wood grown ends up as fire wood. As stall feeding is uncommon, cattle depend on public lands for fodder. In hill regions the use of mulch collected from the forests has been integrated into agriculture and horticulture systems. In the Western Ghats, forests have provided these requirements since the days of settled agriculture. The pressing question now is can this be sustained.

It was the considerations of ecological and environmental benefits which accrue from forests, and which extend far beyond the immediate forest zone, that resulted in the National Forest Policy of 1952 (Ministry of Food and Agriculture 1952). It was noted that: "The accident of a village being situated close to a forest does not prejudice the right of the country as a whole to receive the benefits of a national asset ..... While therefore the needs of the local population must be met to a reasonable extent, national interests should not be sacrificed because they are not directly discernible nor should the rights and interests of future generations be subordinated to the improvidence of the present generation."

The latest policy statement of the Ministry of Environment and Forests in 1988 while not disputing the importance of forest from ecological and environmental points of view, has stressed that rights and concessions enjoyed by people living within and near forests should be fully protected. Their domestic requirements of fuelwood, fodder, minor forest produce and construction timber should be the first charge on forest produce. In other words, the significance of forests for the well being of the country as a whole does not take priority over resource use for the local population (Shyam Sunder 1992).

This appears to be more from an understanding of the situation on the ground rather than from an ecological or environmental perspective. Much has changed between 1952 and 1988. As indicated earlier, reservation had excluded a considerable extent of the original forest, to meet the rural needs (Brandis 1897).



A.1 The forested slopes of the Western Ghat hills in Karnataka

A.2 The major rivers of all southern India rise in the forests of the Western Ghats

2. DESCRIPTION OF THE FORESTS

The Western Ghat belt has four major types of forests of which the Dry Deciduous type occurring in the lower rainfall region is in a very degraded state. The other three types are described below.

2.1 Evergreen Forests

The Western Ghat belt receives about 2,500 to 2,900 hours of sunshine every year (Agriculture Finance Corporation 1992). This source of energy coupled with a rainfall of more than 2,000 mm results in the growth of Evergreen forests, perhaps samples of the most luxuriant and diverse vegetation on earth. In spite of the great variation in rainfall from month to month and season to season, the soil retains an adequate quantity of moisture throughout the year to enable plants to carry on photosynthetic activity without interruption. High humidity prevails at all times and even in the dry season, there is some precipitation of moisture in the early mornings. This is due to condensation of the warm fog which rises during the day to the canopy. In the rainy season, humidity is almost always at saturation point (Kadambi 1958).

Several gigantic trees tower over the general level of the forest and the stature of the trees is surprisingly varied. In sheltered valleys, the large trees attain a height of over 45 meters, while on ridges and slopes, directly facing the western wind, the largest individuals are barely 15 meters in height. The Evergreen forests of Western Ghats exhibit pronounced tropical characteristics both in their composition and general ecology. There is not a single species of the temperate type. With the exception of the giant climber Gnetum scandens, there are no gymnosperms (Champion 1936). Some of the larger trees exhibit conspicuous plank buttresses.

Champion describes these forests as follows:

"Lofty, dense, evergreen forests, 150 feet or more high, characterised by the large number of species trees which occur together. Consociations (gregarious dominants) are rarely met with and two-thirds or more of the upper canopy trees are of species individually contributing more than one per cent of the total number; a few species may be met with semi-gregariously but this is not typical."

Some species of the top storey are trees with clear boles 100 feet long and 15 feet or more in girth, and may be deciduous and semi-deciduous without affecting the evergreen nature of the forest as a whole. The canopy is extremely dense; it has been demonstrated that apart from the scattered giants which project well above the general canopy, differentiation into definite canopy layers probably does not exist. Epiphytes are numerous,

especially aroids, ferns, mosses and orchids. Climbers vary greatly in amount being sometimes conspicuous but in general they are less characteristic than in the semievergreen and moist deciduous forests.

Ground vegetation in typical areas may be almost absent, elsewhere a carpet of Strobilanthes or Selaginella and ferns may occur; grasses are absent. The undergrowth is often a tangle of canes, creeping bamboos and palms, which may replace high forest as cane-brake along streams. Erect bamboos are unusual, but may occur locally. Long cylindrical boles usually with thin smooth bark are typical but plank buttresses are also frequent. The leaves are thick and glossy, only rarely finely pinnate or hairy, and are often white or pink when young. Cauliflory may be relatively common". (Champion 1986)

Kadambi has recognised three distinct altitudinal variants and five clear associations based on horizontal distribution in the evergreens of Shimoga district itself (Kadambi 1945). These are the forests of Ebony (Diospyros ebenum), White Cedar (Dysoxylon malabaricum), and of Poon (Calophyllum tomentosum). The latter has provided ship masts for centuries enabling sea trade of teak, ebony, cinnamom, pepper, cardamom and turmeric.

2.2 Semi-Evergreen Forests

This forest type is situated along the lower westerly slopes of the ghats and occurs as an ecotone between the Evergreens and the Moist Deciduous forests in the east. Semi-evergreen forests have a canopy of evergreen species interrupted by deciduous dominants that rise above the general level. The stature of these forests is lower than that of Evergreens. These forests are the home of White cedar and Gamboje (Garcinia species).

2.3 Moist Deciduous Forests

These forests occupy about 50% of the area of Malnad, occurring to the east of the Evergreen - Semi Evergreen belt. It is the home of rosewood (Dalbergia latifolia) Indian laurel (Terminalia tomentosa), kino (Pterocarpus marsupium) and many other durable hard wood species. In areas in which the soil is not lateritic, teak occurs naturally making it in monetary terms, one of the richest forests in the world. The standing biomass in a well stocked forest of this type could be worth one million Rupees per hectare (One US$ = Rs 30, 1993). It is home of the big bamboo (Bambusa arundinacia) which makes way to the solid bamboo (Dendrocalamus strictus) in lower rainfall regions which are also the home of sandal (Santalum album), the only wood sold on a weight basis.

Many parts of these forests were overworked during the Second World War. Much worse, over major parts today regeneration is totally absent. This is because of over grazing, fires and removal of green material for use as fire-wood.

3. AN HISTORICAL BACKGROUND OF THE RESERVE FORESTS IN INDIA

3.1 Forestry Policy up to 1977

As early as 4000BC Ashrams or Sylvan asylums were abodes of thinkers, philosophers, poets and writers who preached human social values and veneration of forests and their inhabitants. Hieun Tsang (600 BC) had recorded that the Indo-Gangetic belt was thickly wooded. The population of India which was around 150 million at the time of Chandragupta Maurya (320 BC) had not risen significantly by time of Akbar (1550 AD). During the periods of foreign invasions and internal wars shifting cultivation was a common practice. As recorded by Buchanan (1867) it was neither considered as illegal nor improper. It was then sustainable, due to a small population and long cycles. By 1805 the population had risen to 200 million and the pressures had begun to be felt. The British continued the earlier practice of declaring certain tree species as belonging to the Government and collected royalty, leaving the rest free for use or felling. In 1848, the Collector of Kanara District, that extended from Goa to Malabar, had described the forests on the slopes of the Western Ghats as badly denuded making many of the rivers, within living memory, unnavigable. Stebbing (1921) has reported that "long before our arrival, the Indian ryot had begun in many parts, to realise that water was diminishing, that streams and springs were drying up".

Dr Hugh Cleghorn, Assistant Superintendent of Hospitals at Shimoga, in 1849, reported that during the summer months, the sun could not be seen due to the burning of the forests. Cleghorn's report evoked the interest of the British Association for the Advancement of Science at its meeting in Edinburgh, in 1850, to set up a Committee to study the effects of forest destruction in the tropics. The resulting report provided the stimulus for the organisation of forest conservancy in India (Shyam Sunder 1992).

Some of the major general conclusions of the committee are noted below.

Over large portions of the Indian Empire, there is, at present, an almost uncontrolled destruction of the forests.

Wherever supervision has been exercised, considerable improvement has taken place.

That special attention should be given to the preservation and maintenance of the forests occupying tracts unsuited for culture, whether by reason of altitude or peculiarities of physical structure.

> That in a country to which the maintenance of its water supplies is of such extreme importance, the indiscriminate clearance of forests around the localities whence those supplies are derived is greatly to be deprecated (Report of the Committee 1851).

The first step in forestry in India was however taken earlier, but with a commercial motive. In 1800 the East India company had appointed a Commission to enquire into the availability of teak in the Malabar forests (Kerala), and regulations in felling were introduced.

In 1855 Lord Dalhousie, the Governor General introduced the "Charter of the Indian Forests outlining forest conservancy for the whole of India". The Government Forest Act of 1865 was the first attempt at forest legislation "for the better management and preservation of forests wherein the rights are vested in Her Majesty and provided that such notification shall not abridge or affect any existing rights of individuals or communities". The 1865 Act provided for the formulation of rules regarding the preservation of the tree growth and prohibiting fires, removal of forest produce, cultivation and grazing of cattle.

In 1894 a Government Resolution of Forest Policy was published. It spelled out that the sole object of administration of the State Forests was public benefit. The resolution broadly categorized the forests as:

a) forest, the preservation of which is essential on climatic or physical grounds, that fulfil the larger good of the community, to preserve which the individual interests should not come in the way;

b) economically important forests capable of producing large sized timber;

c) minor forest and

d) pasture land.

The policy denoted that: "claims of cultivation are stronger than the claims of forest preservation. The pressure of the population upon the soil is one of greatest difficulties that India has to face and that application of the soil must be preferred which will support the largest numbers in proportion to the area" (Government of India 1894). It hence recommended that whenever an effective demand for cultivable land exists and can only be supplied from forest area, the land should ordinarily be relinquished without hesitation. The resolution further stressed that if this applies to economically important forests, it applies a fortiori to minor forests and pastures" (Shyam Sunder 1992).

As a result of this policy decision, considerable areas of forest lands were released and thrown open for cultivation. The Royal Commission on Agriculture in India (1928), mentions that in the Central Provinces since 1906, 2500 square miles of forests were released and in Punjab over 3000 square miles. On a proposal to further release another 1,000 square miles of forests in Punjab, the Commission suggested that the matter might be reviewed in the context of the fire-wood requirements of the people. At this stage, the extent of "culturable waste" and "land not available for cultivation" (and which constituted areas outside reserve forests for meeting the rural needs of forest produce) was about 45% of the total surface of British India. (Royal Commission on Agriculture 1928).

At independence, in 1947, the population of India was 300 million. Until then release of reserve forest for cultivation was of a small order compared to extension of cultivation in the community privilege areas. This was in itself a wrong policy because the community areas set aside at the time of reservation (about double the extent reserved) was determined with reference to the rural requirements of firewood, small timber, fodder and mulch. However, as these needs were growing with increase in population, the area for meeting these needs was rapidly dwindling.

Forests, both reserved and unreserved, in the better rainfall belt of the Western Ghats remained unaffected by the growing population because of the high incidence of malaria.

With independence, the main policy thrust of the Government was on increasing food production; production of energy for industrialization; and the conquest of diseases. All these three policy elements had serious repercussions on forests. In the initial years and until the late 1960's, increased food production was by extension of agriculture into forest lands. Between 1951 and 1976, 43 million hectares of tree clad areas were cleared for agriculture in India. Irrigation and hydel projects entailed clearance of good forests in valleys. Conquest of malaria permitted settlements everywhere. Reserve forests were released freely when revenue lands were not available for the purpose (Shyam Sunder 1992).

In 1952, the second National Forest Policy was proclaimed. This policy was ahead of its time. It was conceptually brilliant but was undermined and sabotaged by other sectors. It spelled out that the nation as a whole has a vast stake in the conservation of forests and commented on the deprivations caused by indiscriminate extension of agriculture. It stressed the intrinsic right of forests to fulfil both protective and productive functions. None of this was heeded.

While each year's land use statistics proclaimed that the forest area of the country was 23% (the records continuing to show even reservoirs as forest, since they had not been denotified legally), and there was a surfeit of forest produce obtained from wholesale clearance of forest areas for extension of agriculture and in river valley submersion areas it was presumed that forests were an inexhaustible resource.

3.2 Reserve Forest Conservation Efforts in Recent Times

By the early 1970's the effects of ecological degradation had begun to be felt. Droughts and floods were increasing. In 1977, the Government of India amended the Constitution to bring forest from the State Sector to the concurrent list. Many States enacted Tree Preservation Acts to regulate tree felling in private lands. In 1980 the Forest Conservation Act was promulgated, requiring the approval of the Government of India before any reserve forest could be released or put into non-forestry use by the State. The measure reduced the release of forest from an average of 154,571 ha per year between 1952 and 1980 to 14,351 ha since then (Government of India, 1989). The Government brought tree planting into the list of major developmental programmes reviewed by the Government each month. Social forestry programmes were encouraged due to the realisation that natural forest can be saved only by developing the required resources elsewhere to meet the needs of the people. A separate Ministry of Environment and Forests, was created whereas previously, "Forest" was a minor component of the Ministry of Agriculture. Rigorous guidelines were issued under the umbrella of the Forest Conservation Act, on environmental evaluation of the projects involving the loss of forests. The National Wasteland Development Board was constituted to deal with the subject of tree planting and reclamation of wasteland.

The National Land Use and Wasteland Development Council, was constituted in 1986 with the Prime Minister as Chairman to take policy decisions on integrated land use, environmental protection, forest conservation, and wasteland afforestation, etc. The Environmental Protection Act and Rules of 1986 which provide for protecting and improving the quality of the environment and preventing, controlling and abating environmental pollution, specifically refer to areas with biological diversity, proximity to Sanctuaries and National Parks and environmentally compatible land use.

In this context, the National Forestry Policy of 1988 was announced. In 1952, when the cost benefit ratio of a river valley project was computed, the basis was nil value to the forest land to be cleared in the submersion area and for rehabilitation of evacuees. In 1988, an

environmental value of Rs12.67 million (to accrue over 50 years) was accorded to one hectare of closed forest. With the introduction of high monetary value to forests very few projects involving release of forest could pass the test of an adequate internal rate of return. The ecological history of the country, has thus resulted now in a policy biased in favour of ecology, and conservation of forests.

B.1 and B.2

Settlements on the edge of reserve forest.

Alternative supplies of fodder and fuel need to be provided to relieve the pressure on natural vegetation.

4. THE HISTORICAL DEVELOPMENT OF SUSTAINABLE FOREST MANAGEMENT IN THE KARNATAKA WESTERN GHATS

4.1 Background

The first major step in sustaining the forests in the Western Ghats was the banning of kumri cultivation viz., temporary cultivation in cycles after felling and burning the forests in the 1860s (Someshwar 1991).

In the initial years of gazetting reserve forests, efforts were mainly aimed at consolidation through survey and demarcation. The next subject which received attention was fire protection, through the formation of fire-lines. Some of the privileges accorded to the villagers were linked with their helping the Department to fight fires. Sustainable Forest Management, over major parts in Western Ghats commenced around the beginning of this century. Forests requiring similar treatments were brought under common working circles.

These were mainly:

- Protection working circle, including forests to be conserved for ecological reasons, and inaccessible forests

- Selection felling working circle, including forests of good quality to be worked in cycles of 30 to 40 years. The harvest of mature trees allowed for the increment gain during the period of the cycle. Extraction is followed by tending of the regeneration; and

- Plantation working circle, including areas to be converted to economic tree species through planting, with the full area to be converted during the period of rotation. In the earlier years this system of working was limited mainly to raising teak.

Studies on the growth of tropical Evergreen species were initiated in the forests of Western Ghats in 1937 and by 1940 seven Linear Tree Increment (LTI) plots and eight preservation plots were formed. Similar work was undertaken in Moist Deciduous Forests from 1952 onwards forming twelve LTI plots. Based on the data from these plots, growth increments of 30 major species have been assessed.

4.2 The Working Plans

The forests were to be worked on the basis of working plans prepared for periods of 10 to 15 years. At the end of this period the results were analysed, reviewed, and

revised working plans prepared. Examples from these plans provide on interesting insight into the planning ideas, and the brake kept on the population growth by malaria.

Revanna's working plan for Govardanagiri State forests (1924) states that the entire requirements of timber and fuel of the villagers are generally met from unreserved lands, including in the enclosures and that these areas provide all the pasturage requirement of their cattle (Revanna 1924). It indicates that on account of the existence of district forests in their immediate surroundings, villagers seldom go to the State forest. It also mentions the seriousness of malarial disease in the region.

In the working plan of Bhadravathi Division, it is mentioned that the entire requirements of forest produce of the people in Malnad are confined to small timber and poles for house building, bamboo, firewood, grazing, thatching grass, and wood for agricultural implements. These are amply provided from outside reserved forests. The plan also speaks of depopulation due to malaria (Anonymous 1930).

Muthanna's working plan for Heggadadevana Kote forests in Mysore district (1932), discusses the seriousness of malaria in the region and the subject of meeting the requirements of the people. The plan describes the items permitted to be removed free of charge from the forests and explains that the entire local requirement was being met. Here, however, a condition imposed on the villagers in the region mandates their help to extinguish forest fires and to attend to such forest works as may be assigned for two weeks in a year (Muthanna 1932).

The working plan for the North Mangalore Division 1934 of Davis and Krishnaswamy, indicates that all the requirements of the villagers forest material were met from outside the reserve forest, from unreserved area and wasteland. Exceptions were green leaves and dry humus in the coastal region which were collected from the reserve forests. The plan mentions malaria disease in the ghat belt (Davis and Krishnaswamy 1934).

In Kadambi's working plan for the ghat forests of Shimoga and Sagar divisions (1945), it is mentioned that in the evergreen forest zones, villages are few, and isolated houses are scattered over the area adjoining the State forests. Chief requirements of the people are small timber, poles, and posts for house building and agricultural implements, firewood for heating, cooking and boiling jaggery and green leaves for composts and grazing ground for cattle. These requirements are generally met from the district forests, Soppinabettas and Gomals (grazing grounds). It is only in the case of

villages which form enclosures or where district forests are insufficient to meet all the needs of the cultivators that concessions and rights have been granted to remove the materials from reserved forests. Malaria is again noted as a dreaded disease.

Coelho's revised working plan for the high forest blocks of Kanara Northern division (1956), mentions that the timber requirements of agriculturists are met almost entirely by free grants and that bamboos for agriculture use are also removed free. Firewood is similarly collected freely from dead and fallen trees of "unreserve" species. All areas are open to grazing, except areas under planting and during the period of establishment. The country is reported to be malarious.

Working plan for a portion of the eastern deciduous forests of Coorg (1959) of Somaiah indicates that the needs of the people for forest produce were almost entirely met from lands situated outside the reserves. It describes extensive areas of pessaries (Community privilege area) available for grazing and free removals.

In the revised working plan of Korlahalli for the Mundgod teak pole forests of Kanara eastern division (1960), the requirement of the people is described as grazing, firewood, timber for huts, small houses, cow sheds and agricultural implements, bamboos for fencing and huts, thorns and brushwood for fencing, and dry leaves for mulch. It is indicated that these demands were met under the provision of the Privilege Code. The plan indicates that since 1955, the dreaded malaria had been eradicated.

The working plans cited above cover a period from 1924 to 1960. They include examples from all the areas that make up the Western Ghat belt in Karnataka. The areas include zones receiving rainfall of 1,000 mm to 7,500 mm. In all areas, where common land could not meet the local requirements, they were met from reserve (or State) forests.

It would be interesting to analyse in more detail the changes that have taken place, in the dependence of the people living in or around the reserve forests on these forests as this is the most significant factor in sustainable management of these forests. This can be gleaned from a perusal of the working plans of the earlier decades discussed above.

4.3 Policy Provisions

In Uttara Kannada District a string of firewood depots have been maintained for over six decades by the Department. Firewood is sold at a highly subsidised rate at these depots. This is seen as both a conservation measure to prevent indiscriminate firewood cutting and as a local facility.

In the erstwhile Mysore State, a system of removal of firewood in bullock carts on permits at seigniorage rate was prevalent. In the beginning it was meant to meet the requirements of individual households but in due course it become commercialised. In the absence of dead wood, living materials were removed, and as a result the system was stopped in 1974. In lieu, the Department opened firewood depots for sale on a 'no profit no loss' basis. In 1980, in addition to the Departmental Depots, the Karnataka State Forest Industries Corporation, a Government undertaking, and local Co-operatives were involved and a network of depots were created. In 1974, the provision permitting commercial disposal of timber from some of the individual privilege areas was repealed.

During the 1930s, the Mysore Iron and Steel Works was setup using charcoal as fuel. The charcoal was supplied from the Government forests. In spite of being a Government Company, in 1974 orders were issued to scale down the supply of charcoal and the supply was terminated in 1978.

During the 1970s, a string of National Parks and Sanctuaries were created. Today they cover 5,796 sq kms of forest area in the Karnataka Western Ghat belt (Ministry of Environment and Forests 1987). The core areas of National parks and sanctuaries covering about a third of the area, are excluded from departmental extraction.

In an effort to obviate possibilities of smuggling the sale of standing coupes was terminated in 1978. In lieu, logging through contractors for supply of material to Government Depots was initiated and later, all the logging works were entrusted to the Karnataka State Forest Industries Corporation or recognised societies.

The State Forest Act was amended in 1981 to permit the Government to increase the rate charged for supply of forest raw-materials to industries every two years. This removed the privileges of units set up at a time when industrial use of forest raw-material was considered essential and which were granted long leases at very low rates. Another amendment in 1984 permitted exclusion of eucalyptus and bamboo from industrial supply, for diversion to the rural populations. Rates charged in the latter case were considerably lower than that applicable to industries.

A Forest Development Fund, for the development of forests, was constituted during the early 1970s by the levy of tax on all forest sales. This is a revolving fund available to the Department in addition to its normal budget for developing forests. This accounts for around Rs 60 million per year.

In 1973 when requests for release of forests for cultivation had reached a crescendo, the government surrendered its power to release reserve forests to the Legislature. This, thanks to the multiparty system, stopped the release of forests for expansion of agriculture.

In 1982 clear felling of forests for raising plantations, even in the case of teak, was stopped in the State of Karnataka. Planting was thereafter taken up only in open gaps or in degraded areas. This was accompanied by intensive research resulting in firstly the development of a new system of teak planting with pre-sprouted stumps in poly-bags, and secondly establishing nursery and planting techniques of more than 150 other indigenous species.

Under the Western Ghat Development Programme, funded by the Government of India, forests deficient in regeneration were demarcated for total protection from cattle and fire. This has facilitated the establishment of natural regeneration over vast stretches of forest. In 1987 pending review of working plans after full inspection by a Committee of Conservators, timber extraction from evergreen forests was suspended. The suspension still continues. In 1990 green fellings in other forests were stopped as many working plans had lapsed and their revision was due. Reduction of Departmental exploitation resulted in timber and firewood extraction coming down from three million to one million cubic meters per year in the decade ending 1989 (Principal Chief Conservator 1990).

In spite of these efforts, the problems of removal on headloads and browsing by cattle persists. Damage in the form of the elimination of regeneration and recruitment, and forest fires, is serious. Individual small demands of a small population marginalised to the forest edge make no dent on the vibrant tropical forests but numerous small demands of a burgeoning population, liberated form malaria, have inexorable effects. The only solution is to increase production of fodder, fuelwood etc. to met the needs, insist on stall feeding of cattle or reduce the cattle population to a level the forest can sustain and make the people responsible for their acts. If the forest improves, they should secure a share of the benefit.

5. CURRENT DEVELOPMENTS IN THE WESTERN GHAT FORESTS OF KARNATAKA

Growth of population in two Western Ghat districts, since 1901 is noted below:

Year	Uttara Kannada District	Shimonga District
1901	454,000	532,000
1911	431,000	517,000
1921	402,000	493,000
1931	418,000	520,000
1941	441,000	551,000
1951	518,000	663,000
1961	690,000	1,017,000
1971	849,000	1,301,000
1981	1,071,000	1,658,000

(Nadkarni 1989)

These figures show that the population in the Western Ghat belt was stable between 1901 and 1941, and in the next four decades it has increased by over 250 per cent.

Coupled with increases in human and cattle populations community privilege areas were drastically reduced through land grants, by the Revenue Department, for extension of agriculture. What is left is badly degraded and the dependencies on firewood as fuel and public land for grazing have not changed. This has resulted in most of the needs of the rural population for grazing and firewood now being met from reserve forests.

According to Nadkarni (1989), over 78% of fuelwood used in households in Uttara Kannada District is now obtained from reserve forests. In the case of grass, it is 69%, and mulch and manure it is close to 55%.

Forests account for nearly 15.5% of income and "the contribution of forests to the local economy can be said to be much more than what is indicated by the proportion of the imputed value of forest extraction to the local income because dependence on forests for leaf manure and fodder particularly is still the main source of sustenance of the local economy".

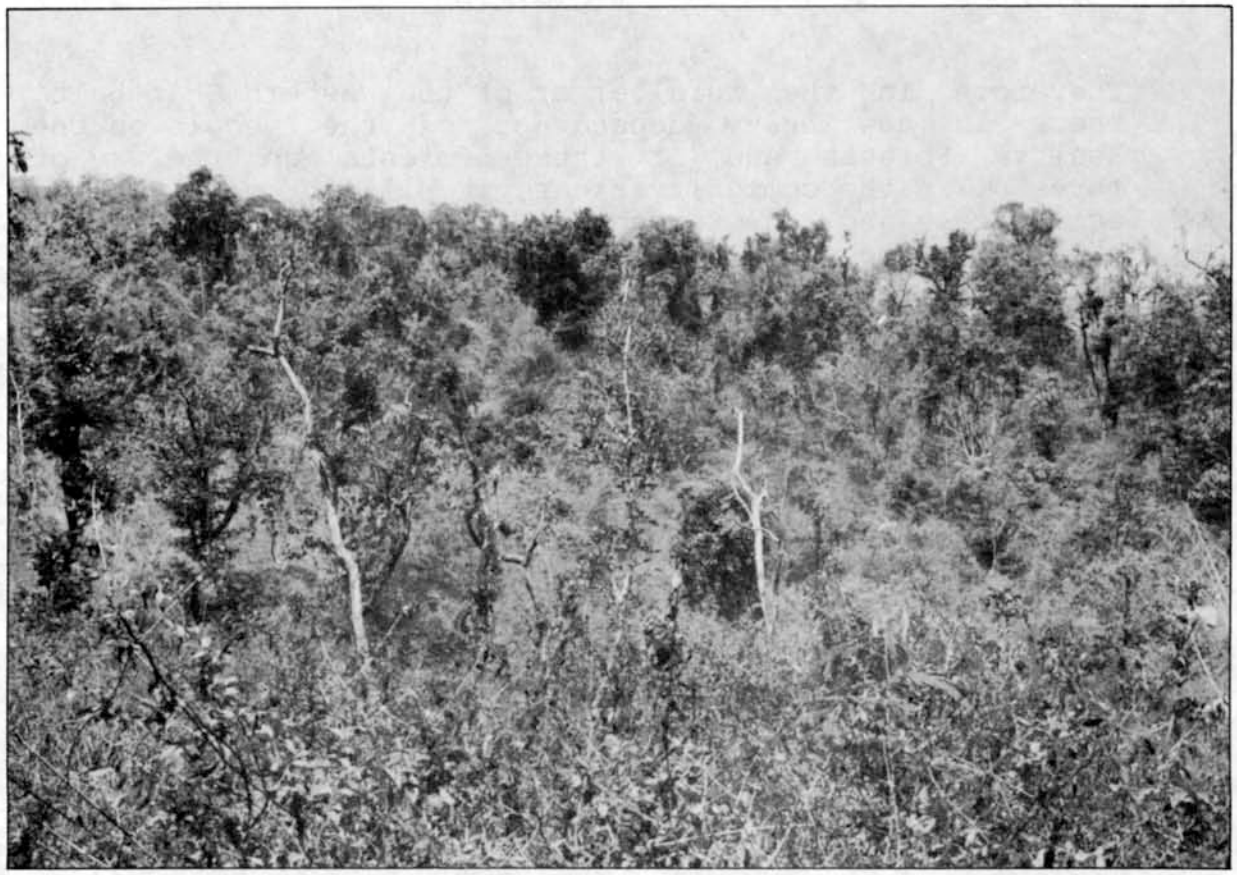
Nadkarni's study has however not included the value of benefits secured by the people from herbs used as medicine, wild fruits such as mango and jack fruit, vegetable butter from species like Vateria indica, souring items in culinary use like fruits of Garcinia indica, G.xanthochymus and Artocarpus lakoocha. Fruit yielding trees are the last to be eliminated by the villagers in degraded reserve forests and community privilege areas (Shyam Sunder 1989).

Therefore in the rural areas of the Western Ghat belt, there is now heavy dependence of the people on the Reserve Forests and if these forests go the way of forests in the community areas, it will not merely be an ecological and environmental disaster, but an economic crisis for the local populations.

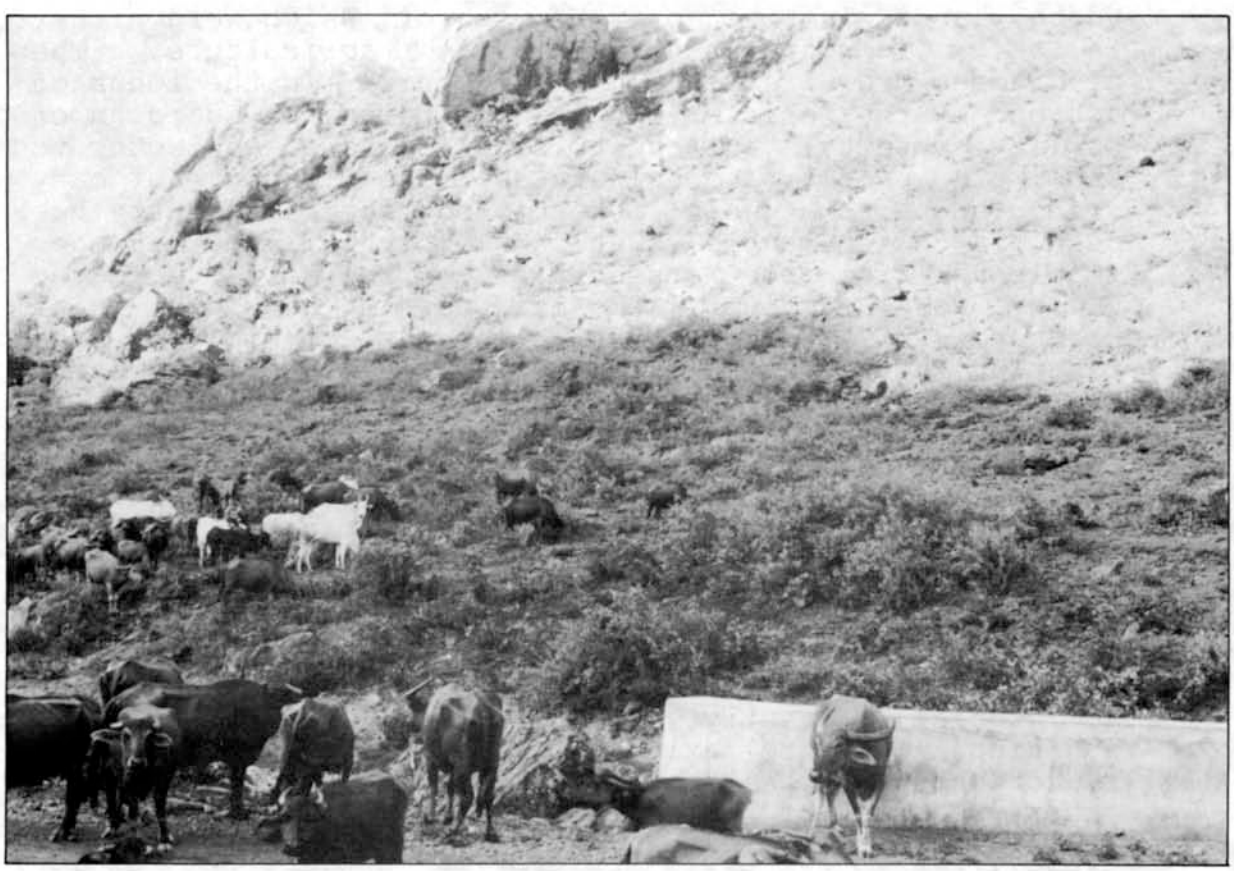
The economic importance of these forests at the State and National levels is equally significant. If we exclude the Evergreen and Semi-Evergreen forests and consider only 75% of the Moist Deciduous forests for timber extraction, with some tending and attention, an annual increment of $5M^3$ per hectare in perpetuity is harvestable. The forests are rich in teak, rosewood and other commercially valuable hardwoods. The timber, at current prices, should fetch on an average Rs7,000 per M^3 (USD 233), producing a return to the State of Rs15,172.50 million (USD 500 million) per annum Moreover, timber as a commodity cannot be dispensed with. In this computation of commercial value, bamboo, firewood and minor forest produce items are left for use by the people of the region, and therefore excluded from the commercial calculations.

Since the late 1970s and through the 1980s aid projects in the forestry sector in India were mostly limited to Social Forestry (SF). These programmes were aimed at rehabilitating denuded community privilege areas and waste lands in the private sector, which were either fallow or under unsustainable agriculture. The programmes required a complete shift in the focus of action by the forester. In lieu of being the guardian of public property, he had to function as a benefactor to the rural people, and help raise trees. In spite of many criticisms, some well intentioned, social forestry has been a remarkable success in India. The damages resulting from the absence of a scientific land use policy were evident, and it was the new ideas which prompted and promoted the prospects of relief. Tree planting has now been accepted as a means to improve the quality of life of the individual in rural India.

One of the major aims of social forestry was to increase production of biomass in order to reduce the pressure on reserve forests. This was the only benefit which was expected to accrue to the reserve forests and this it did. Yet, in other ways the regular forestry sector and in effect the natural forests also lost in the bargain. This was due to the system of budgetary allocations followed by the State Governments. Funds made available to social forestry projects were not treated as additional to the existing budgets, and considerable reductions in the specific budget heads dealing with other sectors of forestry resulted. In a few states a small segment of social forestry funds was used for rehabilitating degraded forests (as in Karnataka) or for involving the people in protecting the forests (as in Orissa and West Bengal). However, the overall impact was marginal and degradation of the reserve forests continued.



C.1 Forest degraded by overcutting and fire.



C.2 Intense browsing by cattle prevents any forest regeneration

6. THE WESTERN GHATS FORESTRY AND ENVIRONMENT PROJECT

6.1 Background

The announcement of the British Prime Minister in October 1988, that the UK would direct more aid to the wise and sustainable use of forest resources in developing countries prompted the Karnataka Forest Department to approach the UK Overseas Development Administration, (ODA). The Karnataka Forest Department (KFD) already had close linkages with ODA, the State's programme being partly funded by ODA and the World Bank. In addition the support of ODA had been utilized by KFD for a major reforestation programme of Mysore Paper Mills. The ODA Forestry Advisers were aware of the environmental and socio-economic importance of the forests of the Western Ghats, as a result of their visits to these ODA-funded projects.

The "Western Ghats Forestry and Environmental Project" assisted by the ODA is a milestone in the attempt to rehabilitate the forests in the Western Ghats, with the objective of restoring sustainable management in perpetuity.

6.2 The Initial Proposal

The first draft report on Integrated Development of Forests in Western Ghats had been completed by July 1988. This was a straight forward, forestry project with twin objectives of production and conservation. It was very ambitious, seeking to cover 12,000 square kilometres of forest area in the Western Ghats, in five years. The largest component extending over 0.85 million hectares was consolidation of forests through demarcation of the boundaries where these are effaced, followed by control of grazing and providing the areas with fire protection. Planting in open areas, under-planting in degraded areas, promotion of economic species through planting or sowing, with protection in better forests, plantations of bamboo and sandal for the artisans, and the small scale industrial sector accounted for 0.32 million hectares. Two new components suggested were the production of superior quality seedlings by an agency separate from that engaged in the plantation, and the formation of two ex-situ Gene Banks. The project proposed to be implemented over 5 years was to cost Rs2,792 million (USD 93 million).

The Forest Department accustomed to function in relative isolation, had to face several criticisms during the course of implementation of the SF programme in the

State. To come to terms with the criticisms, the Department organised a seminar, on the topic of the Western Ghat project, during March 1989 with representatives of Non-Governmental Organisations, (NGOs) academics, representatives of management and social Institutes, politicians and renowned personalities associated with the rural people of the Western Ghat belt. Surprisingly, there was a consensus on the need for the project and good publicity for the proposal through the media in the country. The question, however, which came up repeatedly was the "compensation" to be accorded to the people who might gain in the long run, but who would lose in the initial stages of implementation of the project. Their support incumbent legally, but in reality absent, had to be brought in if the project was to succeed.

6.3 The Forestry and Environment Project

A revision of the project changed the emphasis and the title became "The Western Ghats Forestry and Environment Project". Appreciating the importance of ecological balance and the environmental stability of the Western Ghats, with its unique flora and fauna, the earlier objective of production, linked with conservation, remained the thrust in the revised document. Rehabilitation of the degraded areas is to be the medium for securing ecological balance at the same time, through increased production, assuring sustainable living standards of people depending on the forests. The uncertainties in management objectives due to conflicting demands are intended to be resolved through a system of zonation. In principle, what was propounded in the National Forest Policy of 1894. (Section 4.1). The zones are grouped into:

a) Forests in the ecologically sensitive areas, to be protected and conserved for ecological, environmental and bio-diversity benefits. The benefits would accrue locally, nationally and contribute to global bio-diversity conservation;

b) Economically important timber producing forests, to be regenerated and provided with protection to improve timber production, to benefit the State and the country; and

c) Forests in the boundary zone and community privilege areas, that are exposed to strong biotic pressure, to be regenerated with species yielding small timber, firewood, fodder and fruits for benefiting the local population. This broad allocation of interests and responsibilities is reflected in the recognition of five management zones (Section 6.3 below).

Therefore the project reflects the view that the problems of degradation of forests can be resolved only by accepting the dependence of the local population on forests, legally entitled or otherwise. The thrust is to involve the local villagers in the management of the forests from the planning stage itself, with a recognised stake in its successful implementation, and in the welfare of the forests.

6.4 Methods of Treatments

Forests in the core zone (Zone 1), include inaccessible forests, core areas of National Parks and Sanctuaries, forests included in the Protection Circle for ecological reasons, and areas presently being worked but which for reasons of ecology or bio-diversity conservation need to be given full protection. Indigenous knowledge, including ethnobotany, will be drawn upon while constituting the zone. Concessions and privileges, where existing, may need to be reallocated to other areas, outside the core zone.

Forests in Zone II (without habitation), and Zone III (with pockets of habitation), will receive similar treatment. The difference being that in the case of Zone II as in case of Zone I, the zonation and operations will solely be decided upon by the Department. In Zones III, IV and V, it will be decided in consultation with the local people.

Depending on the condition of vegetation and existence of regeneration, the project provides for three models of planting in Zones II and III. The difference will be in the intensity of planting; 500 seedlings per hectare in the open areas; 750 seedlings per hectare in the medium density areas; and in the well covered forest with 1000 seedlings per hectare. It should be noted here that in all the three categories of areas, natural regeneration is deficient. Management will be similar in all the three models. The three models together will cover about 6,000 ha per year, in the first two years.

In the Joint Forest Planning and Management (JFPM) areas of Zone IV and V, plantation models provide for intensive planting with 2500 seedlings per hectare. The proportion of species to produce fuelwood, or fodder, green manure and/or minor forest produce will change depending on the requirements of the communities in the locality. These models together with improving bamboo production will account for around 3,000 hectares per year in the first two years. The produce from these plantations are for the benefit of local populations, linked with the responsibility of forest protection.

The basic aim of the project is to conserve the forests in Zone I while conserving and developing resources in

Zones II and III. Works to be undertaken in Zones IV and V seek to meet the local demand and so contain the biotic pressures to its areas, so that they do not spill over and damage the forests in Zones I to III.

The draft project is novel in many ways. While no new organisational structure is contemplated, the project provides support to the existing executive machinery to fulfil the changes in management practices. They require, in particular to the setting up of Joint Forest Planning and Management Teams, the creation of a division for production of quality seedlings, investment for improved fire protection, and livestock management. Links with NGOs are given emphasis and forestry research and training is strengthened. The management orientation will also be geared towards peoples participation in drawing up work plans.

In the final project document, it has been rightly recommended that in formulating the management plans, the departments of Horticulture, Agriculture and Animal Husbandry, the Panchayath leaders, and NGOs functioning in the area should be consulted and involved.

Provision is made for modern management tools such as Geographic Information System and Management Information Systems. The outline suggested for the Forest Research and Training Institute (FORTI) should enable it to be a model autonomous research institute.

The entire project has been rightly looked at, as an experiment in forest management in association with the people living in and around the forests. The project is to be implemented in one forest circle in the Karnataka Western Ghats during the first two years. In the third year the project will be taken up in the second circle while leaving behind a fully functioning resource circle.

6.5 Project Area

The project will be limited to areas receiving not less than 1,000 mm rainfall, to ensure a high return of biomass. In effect, the Dry Deciduous forests are left out of the project.

The Forest Administrative Circle has been accepted as the unit for project implementation. The State has six such circles in the Western Ghat belt and these are from North to South:

1) Belgaum Circle
2) Canara Circle
3) Shimoga Circle
4) Hassan (SF) Circle
5) Kodagu Circle, and
6) Mysore circle.

The consideration that the initial circle should be predominently in the ghat belt eliminated Belgaum and Hassan Circles. Mysore Circle is eliminated because of absence of regular Evergreen forests. Shimoga has all the components, but the existence of extreme biotic pressures requires a study before project commencement. Kodagu is comparable to Canara, but has extremely complex land tenure arrangements. Hence the Canara Circle with forests extending from the coast to the plains, through the mountain belt, with all the forest types, and some population of forest dwellers has been selected for commencing the project. It is an interesting coincidence that commercial forestry in India commenced in this very same area, nearly two centuries back. Studies for the selection of Zone I areas will be taken up simultaneously in all circles.

The total cost of the project will be Rs 842 million or £23 million, over a six year period. The interest of the State in the programme can be seen from its agreement to remove about 1,900 square kilometres forests from Productive zone to include it in Conservation zone.

6.6 Replicability of the Programme

An economic analysis of the local needs and multi-purpose models worked on short cycles, reveal positive returns at 12 per cent rate of discount. Even in the case of gap planting models, with long cycle species, if the incremental productivity is taken into account, the returns are positive at the presumed 12 percent rate of discount. Of global interest is the suggestion that environmental benefits through CO_2 absorption might amount to Rs3,000 per hectare per annum. The benefits from bio-diversity conservation have not been included in the analysis.

The project document has recognised the inherent strength of the Department to manage the forest scientifically. It seeks to assist the Department to overcome the imbalances that have resulted from the loss of community privileged areas and heavy dependence of the people for fodder and firewood on reserve forests, not legally its responsibilities.

In the foreword to the document, the Principal Chief Conservator of Forests has written that the project emphasis is on process rather than outcomes, on means rather than ends. The project therefore is an effort to develop and implement new management approaches to bring the forests, in due course all the forests in the Western Ghats, back to a sustainable level of use. Success of this innovative project will thus have far greater consequence than the economic benefits which accrue from the limited area initially covered.

7. CONSERVATION AND DEVELOPMENT OF THE KARNATAKA WESTERN GHATS

7.1 Looking Ahead

However valuable a forest is in bio-diversity or other environmental values, if production does not satisfy the local demands for bio resources, conservation of forests is impossible in India. If lops and tops are not available for use as firewood, young trees in the regenerating pole crop will be cut. If grass is not available, cattle consume regenerating trees. Complex economic and behavioural valuation are no substitute for biomass supply.

Meeting today's needs today is more important for the conservation of the forests than a share in tomorrow's gains. Yet, in some cases the immediate needs may be reduced or practices altered if the proffered gain is a rainbow of fortune. The rainbow should not turn out to be a mirage. Often we tend to oversell the idea of incremental gains and the future share to the people and if reality falls far short of what has been promoted and is anticipated, the result will be worse than the prevalent indifferent approach of villagers to the forests.

7.2 Demands on the Forests

An interesting illustration from personal experience provides a good example. I was a member of the Swedish International Development Agency team to evaluate the Social Forestry Programme in Orissa and toured the Tribal belt of the State in 1992. The total involvement of the people in the new philosophy of sharing the gains from the forest which they help to protect, was impressive. Each village would depute two persons everyday to "tenga parai" or patrol, the reserve forest attached to it. This encompassed a stretch of contiguous forests, protected in this manner through involvement of all the neighbouring villages. I asked the villagers in one hamlet the need to tenga parai, if people of all the villages were committed to forest protection. My question was, protection from whom? This question disturbed the leader. He was surprised at the ignorance of an outsider. What about our firewood? The small timber for the ploughshare? Bamboo for repairing the hut? We have to have these and we secure it from the forests attached to other villages. And other villagers steal it from ours. That is why we have to have tenga parai!

What is the gain? The wasteful use, may be reduced compared to the situation when the forest is treated as no man's property. However, the minimum need itself could be way beyond the recuperative capacity of the

Forest. Unless and until the resource to meet this need is built up in the forest, our reliance on technology only to rejuvenate the forests is futile.

7.3 Demands on the Foresters

Another revealing experience, was during a visit to Honduras in 1987, when I had the opportunity to see their Social Forestry program. On the first day I was surprised to be taken to a showroom on the side of highway, set up and maintained by the project staff. Earthenware curios were on sale there. I was puzzled at the link between SF and sale of curios. I was told that the artifacts were the enterprise of unwed mothers living in interior villages on steep hill slopes at the mercy of middle-men. The SF programme had correctly identified their economic condition as a key to forest protection and secured their goodwill by arranging for the sale of earthenware curios at far higher prices. The foresters had gone beyond their normal duty of planting trees and other departmental targets. I was delighted to learn that they had correctly identified forests as being an integral part of the local economic livelihood, and their conservation linked to the needs and well being of the people.

A forester is disciplined by training. He is usually also the only Government official who lives and moves with the people living in or around the forests. Today, unfortunately, his assigned task is of protection of forests and he has nothing more to offer to the locals. Drinking water; a school room; an approach road; loan for buying a bullock; even bamboo to rebuild a burnt shed? These are responsibilities of other departments, yet it is the forester who is in most frequent contact, and is able to deliver a response to the needs of the rural people. Cannot foresters be given the voice to speak on behalf of the dwellers in and around the forests, in seeking a share of the development programmes? Until this happens will the forester be accepted as a partner by the villagers merely because he has now offered a share of gains from forests, while the whole was theirs earlier for use or misuse? Joint Forestry Project Management is certainly a step forward. But will it be enough? Indian forestry has gone into a vicious circle of low investment, low yield, low income leading to further low investments. The innovative approach now being taken in the forests in the Western Ghats can prove the fallacy of this situation.

Half of the gains from JFPM areas go to the participants, of which half the amount will be constituted as a fund to ensure planting, to sustain the programme. The possibility of converting this fund to promote rural credit through refinancing (from National

Bank for Agriculture and Rural Development) should be considered. This would support forest produce based cottage industries, and alternative enterprises like poultry farming, dairying, apiary, silk rearing, eco-tourism, etc which would bring about economic benefits of the forest dwellers and reduce their dependance on forests.

One good feature of the approach to management under the project is a lack of rigidity in the prescriptions, and decisions to make changes can be made in the light of field experience. The lessons of the past show the importance of such flexibility, in adapting to the present changed situations, and in planning to meet the needs of the future.

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