KFRI Research Report 89

HISTORY OF FOREST MANAGEMENT IN KERALA

Mammen Chundamannil

KERALA FOREST RESEARCH INSTITUTE
PEECHI, THRISSUR

July 1993 Pages: 114

CONTENTS

Abstract

The attempt has been to discern the main trends rather than present the chronology of events. Three broad phases in forest management has been identified, They are presented as (i) the rise of forestry, (ii) the period of turbulence and change, and (iii) the ascent of conservation.

The major achievements during the period of the rise of forestry are the reservation of forests, the perfecting of teak planting techniques and initiation of systematic management on the basis of carefully prepared working plans.

During the period of turbulence and change, efforts at mechanisation of logging and opening up of forests for food crop cultivation affected the continuity of operations according to the working plans. The post Independence Forest Policy (1952) favoured subsidised supply of forest raw materials to industries. Large scale industrial plantations were also raised. Added to these, forest clearance for irrigation and power projects and peasant migration info forests led to phenomenal loss of forests and destroyed the compactness of the reserved forests. Legislation for Government take over of private forests was enacted during this time and a State Forest Research Institute to support forestry was set up.

The Wildlife (Protection) Act 1972 and the Forest Conservation Act 1980 are major events in the ascent of conservation. Restriction on clearfelling and stopping of selection felling has arrested the earlier trend of forest degradation. The recommendations of the High Power Experf Committee on Forest Policy in 1986 in Kerala and the conservation oriented New Forest Policy (1988) of the Government of India reflect a sensitivity to global concerns and is a strong indication of change from past trends.

INTRODUCTION

The unique geography of Kerala, with high mountains and dense forests on the east and a narrow coastal strip on the west, intersected by 44 rivers circumscribed communication to the navigable stretch of each river system. As trading activities were concentrated on the coastal towns, settlements clustered around them. Natural checks to population growth and rigidities in the institutional framework of land ownership and tenure greatly restrictad the expansion of cultivation to the forested hills of Kerala. Rice, the most important cereal crop, was gradually extended into the forested valleys with the help of a refined crop calendar and a labour intensive technology developed by the Namboodiri Brahmins. The difficult task of developing rice fields from forests was accomplished without tho help of animal or mechanical power by massive social mobilisation following establishment of temples[2]. Changes were taking place in the agrarian economy as early as the beginning of the sixteenth century and the customary authority over land was not a static entity. Cultivation was extended to pockets in the interior forests also[3]. New chiefs and swarupams were being established. Although major roles

---

1 Satish Chandran Nair (1988) gives a good description of the geography and the present condition of the forests.

2 Balakrishnan 1985.

3 Paddy cultivation in Ariankavu and establishment of the Shasta temple in the sixteenth century is an interesting example. (Show case records no. 228 AD 1654 State Archives, Trivandrum. Mentioned in Ganesh, 1991).

were played by the brahmins, non brahmin chiefs and land owners were also becoming important[4]. Gardens of fruit trees, pepper and other spices were also developed from partially cleared forest lands[5].

The transformation of the extensive forest landscape of Kerala during the last two centuries is remarkable. Where once only small groups of tribals eked out a precarious existence threatened by killer diseases and crop raiding animals, the change in terms of vegetation and composition of human population is truly profound. Protected by the lofty ridges of the Western Ghats from the rest of peninsular India, malarial environs, difficulty of obtaining guides[6] and most of all, the lack of market opportunity except for a few spices collected from the wild by tribals, the forests survived without significant human modifications. The Dutch and The Portuguese helped develop commercial cultivation of pepper and coconut. However, this was restricted to home gardens in the settled areas near the coast.

The emergence of the British as the unchallenged supreme power in India in late eighteenth century, the assumption of direct rule over Malabar by defeating the Mysore ruler Tippu Sultan and the establishment of suzerainty over Travancore and Cochin during the same period led to major political and administrative changes that had significant impacts on the forests of the region.

---

4 Examples of new swarupams emerging in the sixteenth and seventeenth centuries were Kollenkode, Taruswarupam Palakkad, Kadathanad, Nileswaram, Punjar, and Elayadath Swarupam Kottarakara (Ganesh 1991 304)

5 Janaki Ammal

6 Ward and Conner 1863

The seed of change was the entry of European planters' attempting to develop plantations in the hills of Western Ghats after clearing and burning the forests. The initial **success** with coffee in the private sector and teak in the public sector augured well for the expansion of such activity. Even as late as mid nineteenth century, except for the roads built by Tippu Sultan in Malabar, transportation facilities in Kerala was largely limited to water courses. The planters took the initiative in building roads to the hills, the government of Travancore was particularly favourable in aiding such ventures and when the Public Works Department was formed its road building activity was focussed mainly on the plantation areas'.

The transformation during the last two centuries was facilitated or accelerated by three factors or processes of development. The first was the economic integration of the provinces that made up Kerala to the world markets. The second was the development of communications infrastructure. The third was the control of malaria and political changes that favoured large scale migration of farmers from the plains to the forests.

The economic integration with the world markets led to claiming of rights and controlling the activities of the tribals in the forest by European planters, foresters and people from the plains[9]. Kerala's

7 Often close relatives of european officials and missionartes. Descendants of Col. John Munro, Resident (1810-19) and Henry Baker, missionary who arrived in 1819 held important positions in government and were instrumental in opening up several large plantations in Travancore. See Lovatt (1970). "Foresters and planters were two of the most significant exotic species introduced into India from Europe (Tucker 1987: 120)

8 Pandian 1987; Jeffrey 1976.

fame as a producer of spices attracted merchants from all over the world. It was with the arrival of the Europeans that the competition intensified and attempts to establish a monopoly in trading rights were made. Local rulers, forced to sign trade treaties with the European companies, claimed monopoly rights over the more important items such as pepper, cardamom, teak, sandal, ebony, rosewood, ivory etc.

The expansion of commercial activity and trade in timber including strategic demands such as that for ship building timber and railway supplies on the one hand and the conservation ideas to protect the sources of such supplies and ecological considerations on the other, led to the policy of reservation of large forest tracts[10].

The development of roads got a boost since the introduction of motor transport in the 1920's and the excessive timber extraction during the two World Wars contributed to the expansion of the road network in the forests. Dam building for irrigation and power with its concomitant canals and transmission lines extended the road network to the most interior parts. With the expansion of roads, transportation became easier and the constraint of inaccessibility which prevailed for centuries was overcome.

The development of communications coincided with the successful eradication of malaria in a global campaign supported by the World Health Organisation during 1948-50. Food scarcity during and

---

9 For example see, Logan (1887) On Kanoth forests - "it is inhabited by aboriginal tribe known as Kurichiars who have for years previously carried on destructive system of 'Punam' cultivation It is now under reservation At the conclusion of the settlement the aboriginal inhabitants will be removed and settled elsewhere and works started for the improvement of growth" p 339

10 See Cleghorn 1862, Ribbenthrop 1900, Stebbings 1922

after the War created an emergency situation in response to which unplanned openings in the forests were allowed. Political changes during the same period such as Indian Independence, change over to democratic rule and realignment of the state boundary gave a boost to migrations into the forests, to regulate which, subsequent administrative measures were ineffective.

The plantations developed in the interior forests on the hills were separated by extensive stretches of forests from the cultivation in the plains. These forests were to some extent marked by shifting cultivation by the forest dwelling tribals and to a larger extent by seasonal migrants from the plains". Permanent migration of people from plains to the forests followed the acceptance of tapioca as a subsistence crop and as a bridge crop during the pre-bearing stage of more remunerative cash crops such as coconut, pepper, coffee, etc. The colonisation of the hills by peasants was made possible by the introduction of tapioca. The planters of coffee, tea etc. could meet their food requirements through imports due to their capital and the economies of scale. This was not the case with the small farmer who neither had the capital to tide over the pre bearing period of any commercial crop nor the means to organise supplies from afar. Tapioca was the key. It was better than paddy since prior land development was not necessary, timing was not as important and labour requirement were also not staggered[12].

---

11 Bourdillon (1893) estimated the area under shifting cultivation annualy by tribals and non tribals were 243 and 18 thousand ha respectively in Travancore (p 117) In Malabar the extent of 'Punam' cultivation was about 11 thousand ha per year Cleghorn (1861) quoting Report of the Collector P Grant in 1959

12 FA0 1984, Uma Devi 1988, United Nations 1975

The changes with in forestry were also spectacular since independence. The pace of expansion of plantations accelerated. Apart from the traditional teak plantations, matchwood, pulpwood and fuel wood plantations were raised as part of the Five Year Development Plans. Afforestation of the grass lands in the high ranges was another significant endeavour by the Forest Department[13]. Extension activities such as farm forestry, growing of village woodlots and avenue plantations have also been done on a large scale in the recent years[14]

The span of forestry experience of Kerala is quite unique. The study of Kerala forestry would be valuable to other regions where similar problems can be expected. Forest management has responded to the changes in the external environment by varying the emphasis on expansion, production and conservation in different periods. The development of markets for different produce, technology for plantation raising, processing of produce, improvement of transportation, growth and migration of population, war, food shortages and government policies for expanding agriculture and in supporting industrialisation by providing cheap raw materials in the post independence period have all influenced forest management.

An attempt has been made in this study to delineate the pattern of development of forest management in Kerala and to identify the main trends, rather than to present the chronology of events. The history of forest management in Kerala is remarkable for many reasons. Several pioneering steps both in forestry and in

---

I 3 Joseph 1962.

I4 See Chand Basha 1991.

conservation have been initiated here. Unlike in many other regions, there exist a wide range of land use options in forests. The high pressure of population around and within forests has influenced the course of forest management in the State[15]. Forest loss has also been phenomenal[16]. However, forest management in Kerala will be remembered for the enormity of the challenges it faced and the complex socio-economic and political environment in which it had to function. Despite forest loss, it must be pointed out that almost all the earlier challenges have either been overcome or made irrelevant and forestry is poised to make qualitative improvements in both production and conservation.

The challenge to forestry can be said to be different in different periods. The earlier challenges were in regulating felling and in developing markets for the forest produce. In the second period the challenge was to cater to the new and increased demand for produce and land. In the third period the challenge is to meet the growing demands in an environmentally acceptable manner.

Objectives

This study was initiated with the following objectives. (1) To analyse the development of different silvicultural systems in various periods in Kerala and to identify the factors/ Forces that have influenced forest land use in Kerala; and (2) To record the changes with regard to the intensity of management and to identify the general

15 The density of population in Kerala was 747 per Km^2 in 1991

16 See Chandrasekharan 1973, Chattopadhyay 1984

trends in forestry taking into account changes in allied sectors especially agriculture and forest-based industry.

The evolution of forest management in Kerala can be seen as a cycle beginning with conservation in abundant forests for want of options due to market and technology limitations. The limitations were surmounted and forests were modified extensively during a long interlude and finally the return to conservation as a choice.

The different phases in the history of forest management in Kerala can be portrayed as Rise of Forestry, Period of Turbulence and Change and the Ascent of Conservation. It is not proper to consider that each stage is confined to a particular historical period. In each period elements of different features are present. A new trend often emerges even before the dominant influence has lost its shine. The different periods can be illustrated as follows:

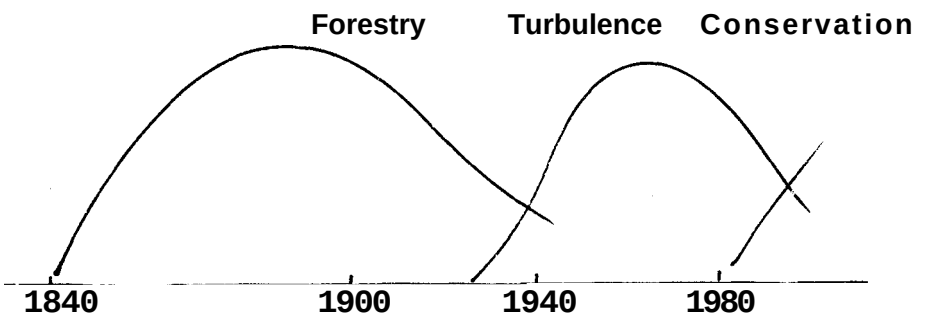

Fig. 1. The different phases in forest management in Kerala

This report is organised in five sections. Section 1 contains an introduction and plan of the study. Section 2 describes the rise of forestry which spans a period from 1840 to 1940. The Nilambur Teak Plantations were initiated in 1842 and forestry continued to progress with the Indian Forest Acts of 1865 and 1878, which were enacted in similar form as the Madras Forest Act 1882, the Travancore Forest Act 1887 and the Cochin Forest Act in 1905. Reserve Forests were created and a regular forest establishment in the lines of British India was organised in all regions. Management of forests and yield regulation based on a carefully prepared Working Plan was the hallmark of the period.

In Section 3 the Period of Turbulence is described. The Second World War created an emergency situation which necessitated production increases that was many times more than that was possible according to the Working Plans in force. This led to abandoning the Working Plans as a guiding document in working of the forests. Pressure for the release of forest lands for non forestry purposes increased and large areas were opened up for food crop cultivation. In the post independence period colonisation and resettlement programmes were initiated in the forests along with large scale projects for irrigation and hydroelectric power generation in the interior forest areas which led to the cutting up of the forests and loss of continuity. The period of turbulence was also marked by the acceleration of production programmes such as selection felling and conversion of forests to plantations of teak and later pulpwood. Fire protection and other conservation oriented efforts suffered a decline in effectiveness due to the increased biotic interference within the forests and loss of compactness.

Section 4 deals with the ascent of Conservation. Developments in the international field and the awareness of the pace of forest loss and degradation within the state led to a reappraisal of the direction of forestry. Conservation oriented management was ushered in with the enactment of the Forest Conservation Act 1980. The new Forest Policy of 1988 carries forward the conservation programme even further. Even in this phase of conservation Kerala has pioneered several steps that go beyond the requirement of the Forest Conservation Act 1980.

Section 5 consists of a discussion of the trends observed. Serious debates on the direction and effectiveness of forest management in Kerala and the return to conservation and sustainable management as a choice is noted in this section.

THE RISE OF FORESTRY

Like any natural resource, forests have also passed through different stages of development. In the first stage, regulation in extraction is attempted, in the next stage development of the resource is attended to and in the third stage, while, the first two are not abandoned, the focus is on resource conservation. These three phases are natural and inevitable, since in the early phase, due to the relative abundance of the resource, in relation to the demand and the market price, it is not worthwhile to invest in resource development. As the market expands it becomes profitable and essential to invest in resource development. Wood production being the primary function of forestry, resource development means investing in regeneration as in raising plantations. When the demands exceed a threshold level it becomes important to give attention to conservation lest the resource base is undermined.

The forest resource of Kerala had an additional importance since the ascent of the British regime, in that, teak timber came to be seen as a strategic resource in the maintenance of naval and mercantile supremacy of the British Empire, It is interesting to see that the strategic interests of the State have influenced forest management in different periods and in different forms.

State Monopolies

Spice trade was an important source of government revenue in the kingdoms on the Malabar coast much before the arrival of

European merchant ships. Most of the spices were collected from wild growth from the forests which covered the entire region beyond the coastal and riverside settlements. The rivalry between European powers to dominate Asian trade led to their insisting on exclusive contracts for pepper in the form of treaties with the rulers on the Kerala coast. Several items important in trade gradually became state monopolies. Prior to the advent of the European trading companies in Kerala there was a flourishing trade with Arabs who possessed a powerful fleet, in the construction of which teak from Malabar was used[2]. The Europeans who displaced the Arabs also learnt the value of teak timber for ship building. A timber depot was opened at Alleppey by Diwan Raja Kesava Das during the end of the eighteenth century. Large supplies of Teak for naval construction from Idiyara valley (Malayattur) is also reported[3]. Ward and Conner, who surveyed Travancore and Cochin during 1817-20 report that lease of river basins to contractors for the extraction of teak was being replaced by direct working by government agency.

Even before the strategic importance of teak for defence was recognised there was a tradition which required non brahmins to strictly desist from using fine timber like teak for their homes[4]. It is not known when teak was declared a state monopoly. Rosewood and Ebony were declared monopolies in Cochin[5] in 1837. In Travancore

---

1 Ward and Conner 1863.

2 Kunhikrishnan 1987, quoting E.C Mobbs in Indian Forester, Jan 1941.

3 Iyppu and Chandrasekharan 1962, F.R.1 1961.

4 Ganesh 1991. Quoting M.G.S. Narayanan. Cultural symbiosis of Kerala. (Ph Thesis, University of Calicut) Calicut, 1972, p.86-87.

5 Iyppu and Chandrasekharan 1962.

Rose wood and Anjily were included in the list of Government monopolies in 1844 while Sandaiwood and Ebony were included in 1865[6]. Most of the timber monopolies were established by British foresters appointed to work for the Government[7]

Commercial exploitation of forests intensified, as much as accessibility and market acceptance permitted, since early nineteenth century in Travancore and Cochin, to pay the enhanced tribute[8] imposed by the East India Company. Local opposition to this high impost, led by Diwan Velu Thampi Dalava was put down by the British. The Administration was reorganised under Col. John Munro who was the diplomatic representative of the British (1810-19) in Travancore and Cochin, functioning as the Diwan also simultaneously. Revenue increase was sought by encouraging expansion of cultivation into the forests and by entrusting the coliection and marketing of items of government monopoly to an English officer appointed as the Commercial Agent cum Conservator of Forests[9]. The office of the Conservator was separated from the Commercial Agent in early 1820's and the first independent Conservator was Urban Verres Munro, son of Col. Munro[10].

---

6 Bourdiilion 1893; Karunakaran.

7 Moench 1990: 53.

8 The tribute was enhanced from Rs. 78,000 to over Rs 8 lakhs and from Rs 1 lakh to Rs 2.7 lakhs per annum in the case of Travancore and Cochin respectively in 1805 (Varghese 1970). Further both Stateswere bound to abide by the advise of the Paramount Power on matters related to Administration, Accounts, Industry, Agriculture and Trade (Pandian 1987, quoting C V Aitchison. 1909. Treaties, Engagements and Sanads vol. X, Calcutta).

9 Capt. Robert Gordon of the Bombay Engineers, (Varghese 1970).

Lovatt 1970.

Defence preoccupation

While it was the revenue compulsion that dominated the intensification of exploitation of forests in Travancore and Cochin, in Malabar which was under the direct rule of the British, it was the strategic interest of obtaining sufficient supplies of teak timber for the British Naval and merchant fleet that attracted the administrators. As early as 1796 a European timber syndicate in Malabar was engaged in the extraction and export of teak with Mr Macnochie of the Medical Service as the leading spirit[11].

Unlike in other parts of India, the Madras Government took the view that all forests in Malabar belonged to some *Jenmi* (land lord) or other. This was to appease the Jenmis and to win them over[12].In the initial stages, "lacking in their own trained cadre of tax collectors the European conquerors relied on the old landlord class to collect and remit tax payment"[13]. However, forests belonging to those opposed to the British and vanquished by them such as the Pazhasi Raja of Kottayam (Wynad) and Tippu Sultan of Mysore were taken over and constituted as reserves.

Ship-building Timber

The British realised early during their occupation of Malabar that 'Tippoo Sahib' during his dominion had regarded teak as a royal

11 Ribbenthrop 1900:62

12 Varghese 1970.

13 Tucker 1987.

tree and the same right in these trees existed in the neighbouring States of Cochin and Travancore. Other than issuing a regulation prohibiting felling of teak below 53 cms in girth, "nothing further happened till 1805 when a despatch was received from the Court of Directors enquiring to what extent the King's Navy might, in view of the growing deficiency of oak in England, depend on a permanent supply of teak timber from Malabar"[14].

The enquiry resulted in the appointment of a committee to examine the status and proprietary rights over the teak forests. Following the report of the committee, which found that the capacity of the forests in mature timber had been over stated, a proclamation claiming the royalty right in teak and prohibiting all further unauthorised felling of teak trees was issued. Under further pressure from the Home Government, Captain Watson of the Police Department was appointed in 1806 as the Conservator of Malabar - the first Conservator of Forests in India[15]. Between 1805 and 1822 the jurisdiction over forests of Malabar was transferred from Madras to Bombay following a request from the Government of Bombay "as it is of the highest national importance that every effort should be made to avail ourselves of these resources not only to supply the local wants of Bombay, but also for the construction of ships of war for the Royal Navy"[16]. The ruthless manner of functioning of the Conservator

14 Ribbenthrop 1900.

15 Ribbenthrop 1900.

16 Kunhikrishnan (1987) quoting William Logan (1851); See also Cleghorn (1861

evoked widespread opposition from Jenmis, pretenders to forest title[17] and timber trading syndicates many of which were European ventures[18]. More than the local opposition, the fading of the threat to the maritime empire of the British, the defeat *of* Napoleon at Waterloo in 1815, led to the abolition *of* the Conservatorship[19] in 1823. The timber syndicates and the land owners returned to do immense damage to the standing crop of trees in Malabar. The accelerated extraction was financed by an officer of the Indian Navy advancing large sums to contractors[20] The Indian Navy Board recommended the re-establishment of the conservatorship in 1931 but no action was taken. The shift to iron and steel in naval ship building since the sinking of two wooden ships during the American Civil War in 1862 considerably reduced the importance of teak as a crucial naval priority[21].

Correspondence between the Court of Directors of the East India Company and the Indian Government on a continuous supply of teak from Malabar prompted H.V.Conolly, the Collector of Malabar, to take up the challenge. He reported that teak bearing forests existed in the district which could be leased in. The area calculated by him to

---

17 Many of the owners of the private forests have no idea how they came to acquire the possession. (Narayanan Nair, 1960). Ribbenthrop (1900) states '..they had apparently no better claim than that they took possession thereof during the first days of the reign of the company'(p.65).

18 Ribbenthrop 1900.

19 Kunhikrishnan, 1987.

20 Ribbenthrop,1900: 65.

21 Wooden ships 'Congress' and 'Cumberland' were sunk by the iron clad 'Merrimac' in Hampton Roads at the mouth of James River (James 1981).

ensure continuous supply of teak from the natural teak forest was 260 sq. miles (673 km^2). The Court of Directors suggested that it would be cheaper and that 'plantations of a much smaller scale would suffice for all the demands of the public service'[22].

The credit of initiating systematic planting of teak in India goes to H.V Conolly, Collector of Malabar. Raising of teak as a forestry enterprise marks a momentous shift from a purely extraction and regulatory function of forestry to a phase of resource development. The breakthrough in germination of teak seeds is credited to Mr Bates, Head Accountant in the Collector's office. H. Smith and Sergeant Graham appointed successively by Conolly between 1841 and 1843 to plant teak, initiated several experiments on their own and those suggested by Dr. Wight, Superintendent of the Cotton Farms and Monsieur Perottet, Superintendent of the Botanical Gardens in Pondicherry[23] Chathu Menon, who succeeded them as Sub Conservator achieved success in nursery raising. Chathu Menon[24] served for 18 years from 1844-1862 and was in charge of the plantations throughout the period. The success of the plantations and the bright commercial prospects ensured its continuance and expansion. In 1858 Lord Harvis, the President of the East India Company visited the plantation and presented a memento to Chathu Menon as a token of The company's appreciation[25].

---

22 Stebbings 1922:91; Sankaran Nair 1960; James 1981

23 Bourne 1921.

24 Stebbings refers to him persistently as 'Chatter Menon'.

25 A belt and an axe. Sankaran Nair 1960; Tewari 1992.

Plantation expansion was interrupted in Nilambur between 1877 and 1885 and between 1913 and 1916 following field inspections by the Conservator of Madras. In the first instance expansion was stopped as the older plantations were not receiving sufficient care. In the second instance, poor results in the plantations of preceding years was cited as the reason. Mac Iver the Superintendent of the Botanical Gardens at Ootacamund supervised the first thinning in 1852. Subsequently Chathu Menon attended to the thinning and pruning of the plantations himself. The Conservators of Madras, starting with Hugh Cleghorn showed keen interest in the Nialmbur plantations and gave useful suggestions during their inspections. In 1898, Ribbentrop, Inspector General of Forests visited the Nilambur plantations. He recommended the annual extension of plantations on suitable areas, as much as possible, limited to the availability of labour[26].

Forest Exploitation for Railways

Even before the importance of timber supplies for ship building receded, railway construction picked up in India. Although the construction of railways was a commercial proposition in rhe beginning, it soon became an urgent internal security priority as several princely States rebelled against the East India Company in 1857 ('Mutiny') and the administration of the colony was entrusted to the British Crown. Compared to the demand for teak timber for ship building, the demand from railways was enormous and growing[27]. A wider range

26 George 1961:648.

of species was also acceptable. Railways required not only timber but also huge quantities of fuel for its steam engines. As large forest tracts were denuded within no time for railway supplies, future supplies for the existing network and the planned expansion became a cause for worry.

Railways had high state priority as it was built to facilitate troop movements and trade[28]. In 1862 Lord Delhousie called for the establishment of a Department that could ensure the sustained availability of the enormous requirements of the different railways for sleepers[29]. Nearly one million sleepers'were required annually and Delhousie observed that impending shortages made the subject of forest conservancy an important administrative question[30].

Role of Conservation Activists

The conservation activists became quite effective at this juncture in influencing the government to intervene in the interests of forest conservation. The role of Alexander Gibson, the Superintendent of the Poona Botanical Gardens and Hugh Cleghorn is prominent in this connection. Their activity in the Royal Society for the Advancement of Science and the appeal of Gibson to the Court of Directors of the Company resulted in prompt response. It has also

27 The rail track expanded from 32 km in 1853 to 51,658 km in 1910 (kunhikrishnan 1987 quoting History of Indian Railways, Government of India 1964).

28 Guha and Gadgil 1988 quoting despatch from Government of India to Secretary of State (Nov. 1861).

29 Guha 1983.

30 Guha and Gadgil 1988.

been shown that conservation activists, particularly Scottish surgeons turned naturalists, forced the hand of the Government by their influence in The Royal Society for Arts and Sciences and their own reputation both within India and with the Court of Directors. Criticism of the forest policy of the Englishwas perhaps the only form of political criticism of the English rule in India that was possible to the Scots who were acutely conscious of the effect of English rule in their own homeland[31].

Lord Delhousie who initiated steps for a regular forest management was also influenced by J.D. Hooker, a noted botanist, and son of Professor William Hooker, who travelled with the Governor General during some of his Himalayan exploration tours. The Bombay Government appointed Alexander Gibson as conservator in 1847 and Hugh Cleghorn was posted as Conservator in Madras in 1856.

German Foresters and Sustained Yield Planning

Dr. Dietrich Brandis was appointed as the Superintendent of Forests, Pegu (in Myanmar) in 1856 and in 1864 he was posted as the first Inspector General of Forests in India[32]. The appointment of Brandis, a forest scientist and University lecturer, from Germany, is considered as the dawn of scientific forestry in India[33]. In a way it was fortuitous for Indian forestry that the pioneers of forestry in India were respected forestry professionals as Dr. Brandis and his successors, Berthold Ribbenthrop and William Schlich (who later dominated

31 Grove 1988.

32 Stebbings 1922.

33 Ribbenthrop 1900:72; Troup

the forest education scene as Professor of Forestry at Oxford). Moreover great conservationists such as, Surgeon Gibson and Surgeon Cleghorn preceded these professional foresters as Conservators of Forests. Most of these surgeon turned early foresters were trained in botany in Edinburgh and Glasgow Universities where Professor William Hooker and others espoused the conservation philosophy of Alexander von Humbolt[34].

Although defence, railway, and conservation interests were paramount in the initial stages when the forestry administration was set up, forestry was organised on commercial lines with sustained yield as an important principle of management. By the time the first Inspector General was posted and the Forest Act passed, teak was no longer a defence priority for shipbuilding, but railway supplies were. The advantage with railway supplies was that it was easy to foresee the demand in the coming years and production planning could be made accordingly.

The early foresters with German training and their successors brought in professionalism to the practice of forestry and they were in a position to convince their political superiors about the need to adhere to the scientifically determined quantum of allowable cut from a given area.

Working plans

The earliest Forest Working Plan in India was prepared by U.V Munro, Conservator of Forests in Travancore in 1837[35]. Brandis

34 Burkill 1965

prepared the first Working Plan in the modern format which included yield regulation based on an estimate of the number of trees expected to enter the exploitable girth class during the period of the felling cycle. German forestry science and yield regulation methods came to be an integral part of forestry planning and management in India.

Scientific forest management which can be described as planning and execution of forestry activities with the objective of sustained yields was initiated by these German officers in India. D'Arcy wrote his monumental treatise on Forest Working Plans in 1891 which gave a standardised format to the working plans.

In the initial years of forestry in India the professional judgement of foresters were held in high esteem that prescriptions of the Working Plans were inviolable. An interesting example of the situation can be seen from the remarks of the Governor General on forest working in Punjab; "It is regretted that the number of trees fixed to be felled by the conservator for the Chenab river was exceeded by the officer in charge. I am directed to repeat the injunction conveyed in the review of the report for 1865-66 that after the annual yield of a forest district has been determined it must not be exceeded without special sanction.[36]

This is a crucial perspective in the management of forestry in the country. Although the commitment to sustained yield was very

35 In 1837 Munro estimated that in that season about 100,000 trees of teak was fit to be felled in the forests based on "personal observation of nearly 20 years in the woods". Stebbings 1922:91.

36 F.R.11961:92

strong, the government retained the privilege of sanctioning deviations from the plan. As a rule such deviations were neither considered nor sanctioned till the War years.

In Malabar, P. M. Lushington prepared the first Working Plan for Nilambur for the period 1896 - 1905. In British India there was a lull in the preparation of the Working Plans during World War I but after the War those who left the department on War Service returned and also there was a fresh and heavy recruitment to the Indian Forest Service leading to the preparation of intensive Working Plans.

The German tradition of forest management based on meticulous Working Plans and rigorous implementation of its prescriptions did not percolate to Cochin and Travancore. Bourdillon prepared Working Schemes for thirteen reserves in Travancore by 1899. The schemes only served to localise felling in a compact area. The felling cycle fixed was six years. 'They did not visualise a regulated system or take into account the demands of scientific silviculture'[37] The first regular Working Plan in the modern format, in Travancore, was made by T.S Venugopala Iyer for Kulathupuzha and Yerur Reserves in 1914. In the same year another Working Plan for all the teak plantations in the state was prepared. However soon after the First World War started it was decided by the Government following a forest conference[38] that preparation of forest working plans on an elaborate

37 Velu Pillai 1940 Vol 111:260.

38 'Conservator of Forests, V. Subramonya Iyer pointed out that in the actual working of the forests much modifications were found necessary in the elaborately prepared Working Plans. This necessarily entailed a waste of money' (Bright Singh 1944:320).

scale was not necessary in view of the incomplete and unreliable data available at that time and that preparation of Simple Working Scheme was sufficient[39]. In the Cochin State the first Working Plan was prepared by Govinda Menon in 1907[40].

During the Second World War the plans were suspended and the required quantity was made available somehow or other. 'Extensive extra felling for timber and firewood caused numerous deviations from prescriptions. Further, Working plan staff was cut down'[41]. The demands made by the Second World War were of a greater magnitude than that during World War I. The impact was felt in almost all forest Divisions in the provinces and in the private forests. Extensive overfelling and advance working were frequent. Compared to the damage in other regions the forests of Travancore suffered less[42]. Many varieties of timber which were not used previously in appreciable scale began to be consumed in large quantities. Many plywood industries got established during this period.

The Second World War caused a "set back to the progress of Working Plans. The normal work of posting entries in compartment histories and submission of forms got into arrears. The worst thing was the carrying out of felling in total disregard to the Working Plan prescription"[43]. None bothered to maintain proper records which

39 Velu Pilla; op.cit. p.260.

40 Viswanathan 1958:15. This is perhaps **a** very rough Plan, as Karunakaran (1985) maintains that no Working Plan was prepared in Cochin up to 1950.

41 Champion and Osmaston 1962:117.

42 Viswanathan 1992.

43 F.R.I 1961:94.

used to be the guide lines for the preparation of Working Plans for future scientific working.

The commitment to sustained yield forestry diminished due to several reasons. Firstly, The prolonged period of the Second World War when the Working Plans were abandoned caused a break with the German tradition. Secondly, the exit of a large number of Indian Forest Service officers during and after the wars eroded the leadership ranks in the profession. Thirdly, the political leadership that emerged in the provinces were faced with immediate and pressing problems such as food shortages, that long term problems of forestry or environment were among the least appreciated.

The position continued even after independence. Although the National Forest Policy of 1952 gave stress on priorities of defence, communications and industry in the management of forests, the States gave high priority to agriculture also. Reviewing the situation F.A.O. (1984) observes "In theory, the national forest policy of 1952 continues to be the basis for forestry planning in Kerala, Working Plans, forest development projects, administration reports, etc. reiterate the objectives contained in the national policy. But, in reality, often this is used as a convenient facade to pursue objectives diametrically opposed to what has been prescribed'[44]. Commitments to supply forest as raw materials to industries in the post independence period have also disregarded the prescriptions of the Working plans in force.

44 F.A.0.1984116

Decentralisation of Administration

In British India, administrative control over the Forest Department was decentralised in 1882. Provincial Governments took this opportunity to increase the revenue from forests by deviating from the Working Plans, where they existed and ignoring the preparation of the same where they did not exist. Forest Officers who supported such practices and increased the surplus for the Provincial Government were highly commented in the Annual Report of the States. 'Schlich put a stop to this retrograde step by obtaining the Government of India's sanction to his scheme of centralising, in the office of the Inspector General of Forests, the control and preparation of working plans and the management of forests under the prescriptions of these working plans'. Ribbenthrop considers this as one of the "epoch making events in our forest history"[45].

Decentralisation of forest administration was effected again in 1921[46]. With the grant of provincial autonomy under the Government Act 1935 forests came to be completely vested in the provinces. The Chief Conservators of Forests became responsible only to their respective provincial administrators[47]. Even the control over the Working Plans were entrusted with the Provinces.

The decentralisation of administration had a portentous fallout in that after a sizable recruitment to the Indian Forest Service after

45 Ribbenthrop 1900:93.

46 Forests became a transferred subject with the Montagu-Chelmsford reforms. Kunhikrishnan 1987:58.

47 Government of India 1976 Vol IX5

the First World war the intake was decreased and finally stopped in 1930 under orders from the Secretary of State[48]. The world wide economic depression and its impact on the timber market contributed to the decision to stop recruitment. An Indian Forest Engineering Service was started in 1921 by recruiting 18 persons with service in the Royal Engineers but this too was wound up in 1935 with the serving officers being absorbed in the IFS or in the Indian Service of Engineers. Direct recruitment to the Indian Forest Service restarted in late 1960's. The absence of a cadre of professional foresters under a frame work of All India Service was inopportune in the post Second World War period when pressures built up for releasing forest lands for agriculture, colonisation and various non forestry public sector ventures. Kerala State Forest Preservation Committee strongly recommended the establishment of an all India cadre of forest service officers from the District level upwards[49] in 1962.

The first effective step in centralisation of control over forests since independence was the shifting of 'forests' from the 'States list' to the 'Concurrent list' in the Constitution during the internal emergency in 1976. This was followed by the Forest Conservation Act 1980 depriving the powers of the State governments to disreserve forests or to allow non forestry activities within forests. There was a proposal earlier, following the World Forestry Conference held in Dehra Dun in 1954 to make forestry a central subject. But due to

48 The annual recruitment up to 1915 was 7 to 10 persons. Between 1921 to '25 it was 178. F.R.I 1961:110.

49 Radhakrishna Menon 1962.

opposition from the States, the move was indefinetly shelved. The National Forest Policy 1988 once again envisages centralisafion of control over Working Plans[50].

Efforts at intensification of logging

The lack of communication facilities into interior areas with rich timber resources was keenly felt by the early foresters. Blasting of rocks in rivers to facilitate floating of logs, construction of roads, tramways and timber slips were undertaken by foresters in many regions. In Cochin, with the idea of opening up the rich teak forests of Parambikulam valley for exploitation, a forest tramway was conceived by the Conservator J.C Kolhoff in 1894. A German engineer was brought in and a tramway linking Chalakudy with Chinnar (82 km) was made operational in 1907. Very soon the forests were exhausted. The Working Plan for Chalakudy Division states "the difficulty of providing adequate wood for the tramway, the annual maintenance of which came to one and a half lakhs was keenly felt. The problem therefore was how to supply sufficient quantity of timber for transport by tramway in order to enable it to be worked without loss. Thus the tramway which was brought in to solve the problem of communication into the valuable forests was of such a magnitude that it baffled its own purpose and soon became a problem in itself in that forests had to be worked in order to maintain the means of communication"[51]. The tramway not only depleted the valuable trees but also devastated

---

50 Government of India 1988

51 Viswanathan 1958-13.

the vegetation in the vicinity of the line by making large demands for wood fuel which the locomotives burnt. Roads were developed for the construction of a chain of dams in the Chalakudy river after the second World War. The development of a network of roads in the area made the tramway redundant. As the tramway was making heavy losses, it was ordered to be discontinued in 1951.

A forest Engineering Branch was formed in Madras in 1923 to mechanize logging operations and intensify production. C.S Martin, Consulting Forest Engineer to the Government of India was appointed as the Chief Forest Engineer. A logging expert was selected from America to serve as his subordinate. Operations were started in the Chenat Nair and Dhoni forests in Palghat for extraction, conversion and seasoning of evergreen timber for which there was no ready market. Saw mills were erected in Olavacode, Beypore, Wynaad etc[52].

The intensive mechanical logging operations, although initiated at the time of a boom in the post War timber market was hampered by the slump in the prices which soon followed. leak prices fell to such an extent that no market existed for lesser known species of the Chenat Nair evergreen forests in which the operations were started. The effort therefore was to market fully seasoned sawn timber A kiln drying expert was engaged from Dehra Dun. In Dhoni Valley improved logging equipment from America was introduced and the outturn of timber increased spectacularly. Extensive operations were carried

52 Pearse 1926

out in the Nilambur ares also under the Nilambur Commercial Forest Scheme. A portable saw mill was installed in Beypore in 2925 to convert the large accumulation of teak logs from Nilambur. Saw mills were opened to serve the extraction from Attappady and the Silent Valley.

The Olavakode saw mill installed in 1924-25 contained a seasoning plant and a box making plant. Extraction in Sappal and Elival valleys by American methods of logging using skidders and tractors commenced to feed the mill. "All pretence at following any silvicultural system was abandoned. Trees above the girth two and a half feet at breast height (0.76 m) were felled and extracted, the primary aim being to reduce production costs.... This naturally resulted in the almost complete removal of such species above a girth of two and a half feet as could be marked"[53]

However, there appears to be resentment against such extensive operaticns even among the officers of the Department. As if in response to the prevailing criticisms, the programme was defended as follows: "the area cut over will be immediately regenerated. An inspection of any logged over area of the West coast after the first following monsoon will disclose a solid mass of vegetation to the height of man... since there are many crooked or malformed mature trees ieft standing which are uneconomical to extract. These and the large number of trees under two and half feet which are also left effectively carry on the water storage function of the forest. No exploitation expansion proposedwill in any way affect rainfall or water

53 Muhammad 1959:28

supply"[54]. Pearse was the Chief Forest Engineer between 1926 to 1929. He did an enumeration survey for more than 8,000 ha. in the Nilambur forests for mechanical extraction to supply the Olavakode saw mill since the Dhoni and Sappal forests could not continue to do so. R.S Browne, Working Plan Officer, was skeptical of the efforts of the American Engineer. He criticizes Pearce as "lacking alike experience of the country and knowledge of the existing or prospective market demand"[55]. Due to the heavy financial losses sustained in the operations, Government ordered the closure of the concern in 1929. On the effect of these operations the Palghat Working Plan states, "Considerable portions of valuable forests were destroyed in an attempt to demonstrate the efficiency of these methods. These methods were found unsuited for the conditions obtaining in these forests. They were also not in consonance with the obligations of the Government to maintain the original character of these forests in the interest of conservation of water supplies and prevention of floods and erosion. During 1929-31 these methods were given up and legitimate system of forestry including the maintenance of sustained yield and preservation of the natural character of the forests were reinstated"[56].

Selection felling in natural forests

The only silvicultural system practiced in the natural forests in Kerala is selection felling. Due to pressure from conservation groups,

54 Pearce 1926:33.

55 Browne (1936) lists specific reasons for considering the figures of the logging engineer as exaggerated. p.12

56 Muhammad 1967:26

selection felling has been abandoned in Kerala[57] since 1987 Dead and wind fallen trees are still collected by the Department. The management of selection forests is oriented towards balancing the commercial and government demand with the sustained yield principles. The operational part of sustained yield management is to bring the growing stock composition to a theoretical 'normal forest' from which the 'normal yield' or sustained yield can be obtained indefinitely. There is no fixed unique level of normal yield. Application of improved technology, enhanced inputs and investments can raise the normal or sustained yield from a forest[58]. In selection felling, the area of working is limited to the annual coupe which is a portion of the felling series prescribed by the Working Plan for each Division. More than one felling series may be prescribed for a Division. Within each annual coupe further restrictions on the minimum girth limits for marking a tree, the number of trees that can be marked per hectare, and the distance between two marked trees are prescribed in the Working Plan. These prescriptions are based on data collected during plan preparation by a sample survey of the growing stock and assumptions regarding the growth increment that the class of trees next below the exploitable class will put on after the felling operations. Based on past precedents and current assumptions a felling cycle and rotation is prescribed.

---

57 The original order directed all officers that no tree shall be cut and those already felled should not be removed without the permission of the Government (Order No 6668/87/F&WLD of 4-4-87) This order was subsequently modified to apply only to new selection felling contracts

58 For a discussion on the sustained yield debate see Chundamannil 1986

Given conditions of market acceptance of only a few species, poor accessibility and low investments, selection felling was the only feasible option. This has Seen practiced for extracting teak, sandal wood and a few other acceptable species much before European foresters arrived in India. The European foresters attempted to refine the selection felling in line with the practices in advanced countries such as Germany, where selection forests were managed for centuries on a sustained yield principle. Even as late as 1916, R.S. Troup who held important positions as Central Silviculturist and Forest Economist at the Forest Research Institute, Dehra Dun, commented

the quasi selection system practiced in India do not conform to the definition (of the true selection system), in that it takes little or no account of the attainment of the normal forest and establishment of regeneration to the normal extent, while in too many cases it does not even consider the silvicultural requirements of the species..."[59]. He did not consider that the system should be abandoned but urged more research to be taken up for improving the situation However, the intercession of two World wars and a phase of experiments with mechanisation and intensification of forestry operations by American Engineers during the inter-war period did not improve matters

The thrust for development, particularly industrial development in the post independence period, made industrial supplies an important priority for forestry. Its impact on silviculture in Kerala has been summed up by the first Silvicultural Research Officer Dr. P. N. Nairas

59 Troup 1916.51

follows: “The great demand for certain particular species for the numerous plywood, matchwood, packing case and other wood based industries has forced us to adopt the practice of selective felling or exploitative felling which is not silviculture in any sense of modern fores!ry”[60].He also adds that no attempts at regenerating the evergreens have been made in the past and the successful methods of regeneration are in the experimental stage[61]. The deficiency of regeneration in selection felled forests is mentioned in several Working Plans[62].

Selection felling, in reserved forests of Malabar, managed by officers of the Indian Forest Service conformed to the prescriptio-- of the Working Plans. However, regeneration efforts at best were confined *to* 10 percent of the worked area. In the Working Plan for Palghat Division it is recorded that “the areas once tended have never been revisited and consequently no check on the result of the operation could be made”[63].

A study hy Kerala Forest Research Institute sponsored by the Food and Agricultural Organisation (FA0 1984) also notes the poor regeneration of valuable species in evergreen forests worked under

60 Nair 1961:250

61 ibid p.277. Serious attempts were in fact made in Malabar. For example Wimbush (1931) gives details on regeneration works in Silent Valley Reserve. Gopala Menon (1961) reports ‘funnel sowing‘ with Artocarpus, Hopea and Teak during 1928, ’29 and ‘30.

62 For example see Working Plans of Malayattur (Sreedharan Pillai 1954), Kottayam (Karunakaran 1975), Karunakaran (1982) makes the same observation and mentions fire as an important factor.

63 Basha 1977, Vol1:138.

selection felling. It says, " The so called selection system practiced in the evergreen forests amounts to nothing more than selective removal of commercially valuable trees having an immediate demand" and that "vast tracts of selectively felled forests remain untreated, jeopardising the ability of the system to yield a sustained supply of timber"64. The study remarks that "Although considerable progress has been made in research on the utilization of a large number of hardwood species found in the evergreen and moist deciduous forests, knowledge on their silviculture and management is negligible. Consequently there is a tendency to prefer those species for which information is readily available"[65]. More research on identifying efficient methods for augmenting regeneration in natural forests and for obtaining more reliable statistics on growth and yield of evergreen tree species is exhorted in the study.

The High Level Expert Committee on Forest Policy appointed by the Kerala Government examined the selection felling operations carried out in Kerala. The report of the Committee mentions that the girth limits for felling has been lowered in successive Working Plans and that there has been a tendency to reduce the felling cycle. The prescriptions limiting the number of trees permitted for extraction from a hectare has not been strictly adhered to in practice. "In short the whole selection system now adopted has resulted in selective mining of commercially valuable species (useful to wood based industries or as railway sleepers) totally neglecting the sustained yield principle,

64 FAO 1984 75

65 ibid p 128

the basic tenet of scientific forestry"[66].Specific recommendations on research priorities and on conservation oriented working of natural forests are given in the report.

Another study by Kerala Forest Research Institute reports that even if the Working Plan prescription of six trees per hectare is adhered to, the opening created in tne canopy was found to be of the order of 68 percent. Natural regeneration was poor in logged areas due to changes in micro climatic conditions, logging damages, unscientific road alignment, elephant dragging and loading operations. While complimenting the Kerala Government for discontinuing selection felling it has listed eleven suggestions for improved selection felling if the practice is to be revoked[67].

Commercial Teak Plantations

After a short period of difficulties the teak plantations did surprisingly well and expansion continued regularly. The small beginnings at Nilambur later grew to become the genesis of a vast net work of teak plantations in India. Teak plantations were initiated in Travancore in 1865-66 and in Cochin in 1872[68]. In Palghat teak planting operations commenced in 1872 but most of these proved a failure. In Wynad teak plantations were started in 1876 by Logan, the District Collector[69].

66 Madhava Menon et. al. 1986:14.

67 Balasubramanyan 1987.

68 Iyppu and Chandrasekharan 1962.

69 George 1961.

In Travancore it was under the initiative of Sir T Madhava Rao, the Diwan, that teak plantations commenced. He wrote to the British Resident and obtained his approval for abandoning the cinchona cultivation that had been taken up some years previously and to go in for teak[70]. The first attempt made at Vemburam island off Malayatur in 1865 was a failure. The appointment in 1867 of Mr. Thomas, trained in the Nilambur Teak plantations, as Assistant Conservator at Konni, assured the success of the venture.

Thomas Fulton Bourdillon, coffee planter turned forester[71], occupies a place of honour in Travancore like that of Conolly in the history of teak plantations in Malabar. Bourdillon was Conservator of Forests from 1891-1909 in Travancore[72], during that time he created 6793 ha. of teak plantation[73].

Innovations in Travancore made teak plantations even more attractive, They were the adoption of stump planting in Konni[74] in 1878, the method of planting in crowbar holes in 1879 and the adoption of *taungya* method75 since 1922 for planting and initial care

---

70 Jacob 1933; Menon 1952

71 Burkill 1965:167.

72 Karunakaran 1985.

73 George 1961:647.

74 Moni 1959. Many authors maintain that the first stump planting was done in Ariankavu by Bourdillon in 1891 (Viswanathan 1960, Kerala Forest Department (undated),Karunakaran 1985).

75 An agri-silvicultural practice developed by foresters in Burma where the right to cultivate seasonal and annual crops in new plantations are granted to farmers who are made responsible for crop protection and weeding. The first attempt with taungya in Kerala was made in 1915 by M.Velu Pillai, Deputy Conservator, in Konni. However this became a successful programme only since 1922.

of plantation[76]. These three innovations greatly reduced the cost of raising plantations and lightened the workload of the Department. Planting, protecting and initial care of the plantation was made the responsibility of the taungya cultivator. The success of Taungya enabled plantations to be raised at no cost to the department and often at a premium. From 1908 the tree growth at the site of the plantation was sold to the taungya lessee enabling him to make up any perceived loss in the taungya operations. In 1945 a new clause was added to the taungya agreements by which the taungyadar was called upon to raise the teak nursery also. Later, when large scale plantations were raised, nursery and planting work was done using hired labourers under the supervision of forest officials. In Malabar, taungya method was introduced in 1926-27 and stump planting started only in 1936[77].

Plantation expansion

The period after the war was marked by a sincere effort in afforesting the areas ravaged by excessive felling during the war years. Teak was the most important species used for the work as it was both a valuable and reiiable species for raising plantations. T. V. Venkateshwara Iyer, Conservator of Forests Travancore 1940-49 and Chief Conservator of Travancore-Cochin up to 1951, is credited with the expansion of teak plantations in the degraded forests after the World War II[78]. Reforestation of Chenat Nair Reserve and other areas

76 Moni 1959, Jacob 1933

77 Sankaran Nair 1960

78 Interview with Joseph K Kurien retired DFO

in Malabar, with teak plantations under a Working Scheme prepared by E.A. Lasarado in 1929, after the mechanised logging phase could have inspired this officer who hailed from Malabar.

Forest plantations were opened on a small scale in the pre-independence period; the pace of planting accelerated with the implementation of the Five Year Plans[79]. The expansion of teak plantations in Kerala in the post independence period has an additional cause, it was an acceptable scheme for plan funding. Also Champion had declared that even relatively poor quality teak is preferable to any other possible alternative on economic grounds"[80]. The approach towards teak plantations during early 1960's has been summarised by M.P.George, Chief Conservator of Forests, as follows: "Past experience has shown that even a poor quality teak plantation brings in more revenue than any other species. So at present in selecting areas for raising teak plantations certain amount of liberal approach is considered advisable "[81].

The initiation of planned development under the Five Year Plans accelerated plantation activity. Plan targets for plantation raising was many times that prescribed in the Working Plans in a region. Several Special Plantation Divisions were also created to hasten plantation expansion. Plan funds were provided for initial plantation only and not for subsequent maintenance of the

79 Chandrasekharan 1973, FA0 1984

80 Champion 1932 30

81 George 1961 651

plantations. Allocation of plan funds depends on the level of achievement in spending the past year's allotment. In order to secure the maximum plan funds the plantation programme expanded[82]. Along with this the backlog of cultural operations, thinning etc. also accumulated. The problem has been accentuated by the financial crisis prevailing in the State for the past few years. Due to treasury restrictions and ban on expenditure, except items specifically exempted, time bound and seasonal field operations of the Forest Department gets seriously affected[83].

Teak Plantation Division Parambikulam formed in 1960 was the first Special Plantation Division. The scheme prepared by P. Narayanan Nair, Conservator of Forests, was to artificially regenerate 6070 ha of Parambikulam area which had been overexploited in the past due to the working of the tramway. "Interestingly the scheme prepared, made it clear that the plantations were to be raised in order to keep the tramline alive, although the government, during 1951, had directed to discontinue the tramway"[84]. Between 1961 and 1967, 6500 ha of plantation was raised without even basic infrastructure facilities. Even sufficient seedlings were not available in the nurseries and left over seedlings had to be collected from other Divisions. The Evaluation wing of the Forest Department initiated a study of the Parambikulam plantations in 1976. They found that most plantations

82 Viswanathan 1992.

83 Manoharan 1390:32.

84 Unniyal 1988:31; The tramway was finally discontinued only in 1903 (Karunakaran 1985:239).

were of the Fifth quality. Due to incomplete control records such as Plantation Journals and Division Journals the study was aborted[85]. The first Management plan for Parambikulam Wild Life Sanctuary also mentions that "Plantation Journals and such other valuable documents were not seen maintained properly affecting the field working"[86].

In 1964 Kallar Valley Teak Plantation Division, Achancoil was formed. Despite the Conservator's Inspection Note in 1973 commenting on the extensive failures and poor quality of the plantations, to stop expansion, plantations continued till 1996 ha of natural forests were converted.

Afforestation trials in the high range grass lands were also conducted using species like *Cassia siamia, Albizia,* wattle, etc. at Vallakadavu near Pamba along with *Eucalyptus grandis.* Survival and growth observations subsequently showed that *E.grandis* performed Dest. Grass land afforestation programme was initiated by M.P. George in 1956 when he was the Planning Conservator[87] The Grassland Afforestation Programme later grew to become the nucleus for the extensive pulpwood plantations. raised under the Five Year Plans. From mid sixties eucalyptus was also raised in large scale plantations funded by Central sector schemes. The same officer is credited with initiating cashew plantations in denuded and barren

85 Viswanathan 1992:119, Much of this section is taken from the same source.

86 Unniyal 1988:119.

87 Joseph 1962.

portions of abandoned food production areas and failed teak plantations in Trichur Division[88] and rubber plantations in Chalakkudy Division in 1950s. Bulldozers and other heavy equipments from the Forest Industries Travancore (FIT) were hired to prepare the land for a 16 ha. nursery for rubber[89]. The rubber plantations were transferred to the Agriculture Department and a corporation under the name Plantation Corporation of Kerala was formed in 1962.

The success of initial trials with eucalypts in the grass lands near Pamba, evergreen forests in the adjoining Pachakanam area was cleared and planted up with eucalypts. In 1967, 1134 ha. cf plantation were raised. Although the initial growth was satisfactory the plantation failed due to fungus attacks which were neither anticipated or identified at the time. A study of the yield from eucalypts plantations in Kerala, taking a sample of 173 plantations showed that the mean annual yield per hectare from *Eucalyptus grandis* was 13.76 m^3 and for *Eucalyptus tereticornis* was 7.26 m^3 in a rotation of ten years[90]

An Industrial Plantation Circle with four Divisions cleared nearly 9,000 ha. of semi evergreen forests for raising pulpwood for the proposed Newsprint factory. Planting was done during 1966 to 1970 before it was realised that the plantations were a total failure. Wide

88 During 1956-60, 3,035 ha. of cashew plantations were raised Viswanathan Nair 1962

89 Interview with G Moni retired Conservator who organised the planting works as DFO.

90 KFRI 1990.

spread failure of eucalypts plantations was recognised in 1970 and a committee headed by T. P. Viswanathan Conservator of Forests was constituted to study the situation. The committee came to the conclusion the diseases caused by fungus was the main reason for the failure of eucalypts in the state. The natural environment of high rainfall and humidity in the area was accentuated by permitting taungya contractors to raise a dense crop of tapioca in the young plantations overruling the objections of forest officers[91].

The crop composition in taungya changed from cereals and pulses to tapioca which overtopped the young plantation seedlings. The premium for taungya increased (in auctions) and the attention of the lessee was increasing profits and reducing costs. "In short, what was once an easy and efficient system became a real detriment to the plantation"[92].

Kerala Forest Research Institute reported high levels of soil erosion in plantations raised under taungya with tapioca[93].The High Level Expert Committee on Forest Policy appointed by the Government of Kerala has also found that "taunyya as historically practiced in our State has done more harm than benefit... The practice has to be discouraged in future. It should be possible to provide adequate funds to raise plantations without resorting to taungya"[94].

---

91 Government of Kerala 1977a It was clarified by the Government in a G O dated 8-11-72 that only one stump of tapioca can be planted in the middle of four plants in forest plantations Subsequently in another G O dated 30-11-74, double the number of tapioca stumps was permitted

92 Viswanathan 1960 10

93 Alexander et al (1980)

Research

Formal inauguration of research in Forestry was started with the establishment of Forest Research Institute at Dehra Dun in 1906. A Research Officer was posted in Coimbatore in 1919 who was in charge of silvicultural work in Nilambur and Wynad. Research centers at Nilambur and Palghat were started in 1924. In fact it was one of the best centers doing plantation forest research in India. Travancore and Cochin initiated research only in 1952[95]. The main focus of the research effort was teak. Experiments dealing with spacing, different grades of thinning, site quality changes due to continuous monoculture plantations were initiated in the 1920's. Underplanting of teak plantations with Hopea, Anjily, Mahogany, Evodia, Rosewood etc. were attempted. Trials with exotic species and regeneration of industrial 'Softwoods' were also conducted[96].

The Hindustan Paper Corporation constituted a committee in 1973 to examine the spread of fungus diseases in eucalypt plantations and methods to control it. Consequently a research establishment, Fungus Investigation Unit, was set up by the HPC with the head quarters at Alwaye. They initiated a disease survey in eucalypt plantations in Kerala.

As part of the programme of setting up autonomous Research Institutes in sectors relevant to Kerala's economic development,

---

94 Madhava Menon et. al. 1986:16

95 FRI 1961

96 A good summary of the experiments conducted in Kerala is available in Iyppu (1960).

several research institutes were started under the umbrella of the State Committee of Science and Technology. The Kerala Forest Research Institute was started in 1975. A Research Advisory Committee chaired by the Chief Conservator of Forests (Development) and consisting of all senior officers of the Forest Department ensures taking up of research projects relevant to the current problems in forestry. Almost all branches of forest research are functioning within the Institute.

Research undertaken by the Institute has been directly related to the priorities of forestry in the State. Substantial efforts have been directed to solve problems of man made forests, particularly of teak and eucalypts. Management of natural forests, wildlife biology and wood utilisation have also received attention[97]. Some of the research projects completed on teak plantation management include: Studies on the effect of slash burning on the growth of teak; Study of soils in teak plantations of different site quality aimed at relating productivity variation to soil parameters; Studies on insect pests of teak and control of teak mistletoe through trunk injection of chemicals. On eucalypts management, projects completed include: Standardisation of methods for the control of termites attacking eucalypt in young plantations; Survey of diseases in plantations and control of diseases in nurseries. A break through in cost reduction in nursery raising was achieved by developing a technique for raising seedlings using polyurethane foam for bamboos and trees with small seeds.

97 KFRI 1992

On natural forests a critical study of the management of evergreen forests in southern Kerala and another on the impact of selection felling on the forest ecosystem was completed. A review of forest management systems in the tropical mixed forests of India was also done. Bamboos and cane have received special attention and multi-disciplinary research projects on its various aspects are ongoing

Human ecology and socio economic interaction of tribal communities in Attapady; Studies on the demand and supply of wood in Kerala; Techno-economic study of saw milling industry; Wood raw material availability for plywood industry; Analysis of factors influencing timber prices in Kerala; Studies on wood properties and Standardisation of preservative treatment for different timber are some of the other important projects completed.

PERIOD OF TURBULENCE AND CHANGE

Forty years between 1940 and 1980 was a period of turbulence and change because of several reasons. Firstly, we are observing the developments at a close range (both in space and time) that it is difficult to appreciate the underlying patterns. Secondly, the dominant position of professional foresters in determining the course and pace of forestry in the earlier phase has been replaced by a more complex system where political parties[1] and other interest groups such as migrant agriculturists, industrialists etc. can get their way. Thirdly, with planned development under the Five Year Plans, sectors such as, power, irrigation, industries etc. set their own sectoral priorities without consulting the Forest Department, and claim forest land as a matter of right[2]. Fourthly, while agriculturists (including the Government sponsored category, colonisation, resettlement, arable land scheme etc. and encroachers) had seemingly upper hand for most of the period. Reactions such as evictions and prosecutions have also been initiated during this time[3].

---

1 The Board of Forestry was reconstituted in 1948 to include State Forest Ministers instead of Technical Heads of Forest Departments. FRI (1961:190).

2 The decision to raise sugar cane after clearing forests to supply the loss making Mannom Sugar Mills Co-operative is a typical instance. See reference to SFCK later in this section.

3 The results of course was inconsequential as squatters were well organised. See Nair (1984); Karunakaran (1985); Moench (1990;1991).

Industries were fully supported by the government by going out of the way in providing concessions[4]. The techno-economic survey carried out by the National Council of Applied Economic Research asserted that "forests rank among the key resources of Kerala" and that "there has been an all round development of timber based industries but the cellulose based industries have not received proper attention for example the bamboo potential has not been tapped for paper production". It went on to suggest that "efforts should be made to divert part of bamboo at present being utilised for local requirements to industry"[5]. However, the support to industries was not consistent over the years[6]. Conservation effort was also substantial during this period. The creation of a separate Wildlife Wing, the increase in the area and number of sanctuaries, large investments in research, all point to the fact that it was indeed a period of change.

The period of change and turbulence was marked by a phase when the demands exceeded the capacity of the system to support without compromising on previous standards. In the process, survival of the system itself was threatened. For example the demand for timber exceeded the quantity that was feasible on a sustained yield basis. The alienation of large tracts of forest for non'forestry activities

4 The seigniorage rate for bamboo supplied to industries was "one-two thousandth of the market price". Gadgil (1991) referring to the situation in Karnataka where the price was Rs 1.50 per tonne. In Kerala during the same period the price was Re.? per tonne.

5 NCAER 1962:p 67, 176 and 74.

6 The Gwalior Rayons Company suffered confiscation, without compensation, of 30,000 acres of private forests and plantations raised by them acquired with the full knowledge and acquiescence *of* the state government during the implementation of the Private Forest Vesting and Assignment Act 1971

undermined the territorial integrity of forests. Both these demands were supported by the State so that there was no question of resisting such demands. Forest management depends on the forest policy, and the commitment and support of the government.

Influence of World Wars on the Forestry Sector

Change in forestry was inevitable since there has been a dramatic change in the social, political and economic spheres during the period 1940 to 1980. The population growth was spectacular. There has been administrative changes too. For instance, in the case of Malabar, recruitment to the Indian Forest Service between 1921 and 1925 expanded phenomenally both in the regular service and in the newly created Forest Engineering Service, by inducting a lot of World War I veterans. Consequent to the introduction of Provincial autonomy in 1935, 'forest' became a Provincial subject and the Central control over the Working Plan was abandoned, but training of locally recruited staff continued at Central institutions[7]. The intensification and attempts at mechanised logging in the inter war period in Malabar[8] and tramway operations in Chalakudy[9], followed by even more intensification of felling during the War caused a break with the traditions of the old forestry taught by German foresters. The suspension of the rigors of sustained yield planning and management even in the period after the War for other reasons added to the take over

7 FRI 1961:94&110.

8 Pearse (1926) gives a summary of operations carried out and envisaged

9 see Viswanathan 1958.

by an entirely new set of post war politicians, administrators and foresters made change inevitable. During this long interlude the old forestry traditions such as meticulous inspections to check compliance with Working Plan prescriptions and upholding of professional values vanished.

Several external factors affected the nature and pace of forestry in Kerala. The Second World War and political developments are the most important among them which were responsible for the changes in the forestry sector, as in other spheres. The second World War was a major turning point in the forest history of Kerala. Forestry had risen to the pinnacle of ascent. About three quarters of a century of progress had created an infrastructure for management and inventory information that was valuable if not critical for the British Indian Government. It would not be an exaggeration to state that, had it not been for the forest department, only a very small fraction of the wood supplies could have been mobilised for the war effort. The fact that several senior foresters have been decorated by the Queen of England bears testimony to the value of the service rendered by the forest service.

The war required excessive extraction and the challenge was to accommodate this enhanced demand within the confines of sustained yield management. As vast areas of unexploited forests existed, it was not difficult to meet the war requirements from the vast reserves and private forests. Developments in the market, such as the acceptability of species which were not acceptable earlier, technological developments in wood preservation and processing and in communications helped to expand forestry operations.

Intrusion of Agriculture into forests

Since early nineteenth century the Travancore Government started encouraging cultivation in the forests which were officially called as waste lands perhaps due to their non revenue earning status. In 1818 a Royal proclamation guaranteed tax free enjoyment of cultivated lands for the first ten years in government forests and imposed only light taxation thereafter[10]. Deep in the forests the only economic crop was cardamom. Due to the state monopoly in cardamom trade, primitive technology and malaria, cultivation of cardamom did not pick up till the monopoly was abolished in 1896[11]. The first European Plantation of coffee was started in 1798 in Malabar but expansion on any considerable scale did not take place until 1830's in Wynad and 1860's in Travancore[12].Waste Land Rules[13] for Coffee and other cultivation was issued in 1865 gave a boost to plantation activities in Travancore. In the same year full ownership rights were granted to tenants on government lands by an Act known as Pattom Proclamation making land holdings 'private, heritable, salable and otherwise transferable property[14]. The combined effect of this gave a boost to plantation activity in the forests. In Cochin full ownership rights to government tenants were granted only on the completion of the Cochin Revenue Settlement of 1905-09. Although there was a

10 Varghese (1970) quoting Travancore Land Revenue Manual vol IV 1915:29

11 Nagam Aiya,V. 1906 The Travancore State Manual vol III Trivandrum.

12 Varghese 1970, Tucker 1987.

13 The Government of India formulated Wasteland Rules in 1861 'to administer the non revenue generating lands'. Shiva (1986:613) quotes Baden Powell 'The value of the state forests were not even recognised and the occupation of the waste by capitalists and settlers alone discussed'.

14 Yarghese op cit. p.65.

spurt of cultivation in the foothills, due to the lack of transport facilities plantations did not make headway to the same extent as that in Travancore[15]. In Malabar on the other hand "lacking in their own trained cadre of tax collectors, the European conquerors relied on the old land lord class to collect and remit tax payments. The new Malabar government declared the jenmis were full owners of land not only arable but also "waste" or forest lands eastwards into the hills as well... For more than a century thereafter these conservative landlords controlled Malabar land exploitation. They were slow to expand new land to cultivation and discouraged their tenants from moving upwards into the forests. Further under Malabar's joint family property law, sale of land was extremely difficult, and until well into the century little land became a marketable commodity. Entrepreneurs wanting to grow new crops for distant markets found it almost impossible to begin in coastal Malabar"[16]. Claims on the forests of Wynad by the Jenmis were overruled by the British Commissioner in 1841 primarily due to the suitability of the area for establishing an European settlement and the possibility of raising export crop plantation[17].

The Waste Land Rules were liberalised in 1898 and 1902 in Travancore following the first visit of the Diwan to the Cardamom hills, Diwan Krishnaswami Rao provided special grants of land and financial help to encourage ryots from the Madras State to settle in the hills[18]. In 1898 cardamom cultivators were permitted to clear waste

15 Varghese 1970

16 Tucker 1987 p.132.

17 Tucker 1987:133.

18 Lovatt 1970:21.

lands' for cereal cultivation as an added incentive[19]. The definition of waste lands seems to have been refined as grass lands and swamps, which do not contain valuable tree growth. New rules for cardamom cultivation were issued in 1905, 1914 and 1935 and, several amendments in between for the sale of lands for cardamom[20]. Concern for forest protection held sway during the period 1909 to 1924 that registration of cardamom lands were prohibited during this period. In 1924 the prohibition was relaxed to allow registration of encroachments who occupied the lands prior to the cut off year of 1920. "A boom of registration and encroachments followed from 1928 to 1932. In 1934 the government again regularised the encroachments subject to the payment of a penalty of Rs. 250 per ha. and land tax with retrospective effect"[21].

In 1942 the Travancore Government issued a press communication stopping all registration of government lands and provided for grant of lands on lease for periods of 3 to 7 years. In 1944 rules for Kuthakapatom lease of cardamom for 12 years were issued[22]. New rules in 1961 provided for renewal of leases for 20 years. Between 1972 and 1974 government stopped leasing of lands to expedite resettling of evictees from Idukki project area. In 1975 a high level Committee under K.C. Sankaranarayanan examined the feasibility of Government takeover of those lands leased in Cardamom Hill

19 ibid.

20 The Tharavila (land price) was raised from Rs. 25 to 62 and then to Rs.210" per ha. in successive revisions (Ramakrishnan 1975).

21 Monech p.75 quoting Travancore Land Revenue Manual vol 11:55.

22 Ramakrishnan, K.V. 1975 Report on Cardamom Lands, Board of Revenue, Trivandrum.

Reserve for which the lease period has expired. The committee suggested that it was not feasible to resume the lease lands or even the encroached lands and suggested that leases may be renewed for 45 years and even encroachments may be regularised by leasing the occupied lands to them[23].

Forest lands, being the frontier for agriculture, were also required to grow food for which no self sufficiency was planned. The war disrupted food supplies and the impact was severely felt in Kerala, particularly Travancore which relied heavily of food imports. The expansion of cultivated area did not keep pace with the growth of population in the twentieth century. There was also a marked shift towards cultivation of cash crops and the newly opened areas were mostly plantations of export crops[24]. Due to the famine conditions that prevailed, all out measures were adopted to encourage the expansion of cultivation in forests. The unprecedented nature of the situation brought chaos[25] in the administration since demarcation of each plot and records for the same could not be prepared within a reasonable time.

Political developments in the post independence period favoured the continued settlement by the farmers in the leased in land they had developed. Deforestation in Cardamom Hill Reserve in Idukki District is attributed to the lack of co-ordination between

23 Sankaranarayanan, K.C. et al 1975. Report of the Committee constituted for examining the feasibility of resumption of Cardamom Lands, Board of Revenue, Trivandrum.

24 Varghese 1970.

25 Radhakrishna Menon et. al. 1962

different Government Departments. While the trees belonged to the Forest Department, the land is controlled by the Revenue Department. "The system of dual control and half hearted policy of the Government left both the Revenue and Forest Departments hesitant, reluctant and indifferent. Large areas had been given out either on lease or for colonisation purposes. Hordes of Land grabbers rushed up and cleared vast areas of the Cardamom Hills Reserves taking advantage of the general confusion. Thus except for some evergreen patches here and there, almost the entire Cardamom Hills Reserve came under miscellaneous occupation"[26].The State monopoly over royal trees such as Teak, Rosewood, etc. even when standing on private lands, ended in Cochin[27] in 1928 but it continued up to 1958 in Travancore area[28].

Political parties vied with each other to grant ownership rights to the migrant farmers in the forests. In Idukki District there is a tract called *rashtriya kunnu* which has been fully assigned to farmers by successive governments (Viswanathan 1983). Colonies set up exclusively for rehabilitating ex-service personnel following the Second World War also came up in Ambalavayal in Wynad, Vettilapara near Chalakudy, Vechuchira near Erumeli, Illithode near Malayattoor, Aralam near Kannur and so on.

The massive food production drive, as part of an all India effort known as 'Grow More Food Campaign', was followed by a colonisation programme in Travancore. This aimed at pre-empting

26 Karunakaran 1975: 14.

27 Viswanathan 1958.

28 FRI 1961 (II)' 7

the possibility of a claim by Madras State on the forests in the high ranges on the basis of the large population of Tamil plantation labour[29]. The colonisation scheme alone took up over 20,000 ha. benefiting about 10,000 persons in Devikulam and Peermade Taluks[30] The momentum created by both these official programmes could not be contained as settlement in the hills became attractive due to the elimination of malaria during 1948-50 by a DDT spraying programme supported by the World Health Organisation[31] and the development of accessibility created for timber extraction and construction of dams. The post war boom in prices of cash crops was another reason for the attraction of migrant farmers to the forests.

The Grow More Food Scheme, change over to popular Government and reorganisation of administration due to the amalgamation of Travancore and Cochin States had adverse impacts on forest protection. This came to the attention of the Government and a Committee headed by T.V. Venkateswara Iyer, Chief Conservator of Forests, was appointed in 1951. This Committee came to be known as 'Anti-erosion Committee' due to the importance given to soil conservation in its report. The Committee visited most food production areas within forests and recommended conservation of areas in the catchment of Periyar river where hydro-electric projects were coming up. However, political conditions were not favourable for the implimentation of the recommendations of the Committee and in fact,

29 Moench 1990 and 1991.

30 Interview with N.S Krishnapillay, who was in charge of the colonisation effort, Superintendent Cardamom hills and later Secretary, Food Production Board.

31 Interview, P Narayanan Nair retired CCF.

more areas were opened up for cultivation. The situation turned worse and a series of popular agitations for permanent rights for cultivators within forests were launched. Consequently, the Government renewed the leases for food production within reserved forests. Encrochment into reserved forests also accelerated during this period[32].

To demarkate the fast changing boundaries of the forests, the Government formed Popular Committees in each Forest Range, with the Range Officer as Convener and the Tahsildar as Chairman. However, due to continuing agitations by encroachers and lease holders no demarkation of boundaries could be done.

In 1961 Government started eviction of encroachers from areas near Ayyappencoil. This precipitated a fresh wave of *Sathyagrahas* and agitations, that Government relented and appointed a Committee with K.P. Radhakrishna Menon, I.A.S. as Chairman. This Committee made a detailed examination of the issues, inspected most areas and proposed a re-alignment of forest boundaries for the long-term conservation of forests and rehabilitation of families that are to be re-settled. This Committee came to be known as Forest Preservation Committee. Following the recommendations of the Forest Preservation committee, another attempt at eviction was made in 1964. But due to political opposition it could not be carried through. During President's Rule in Kerala, which followed, a Parlimentary Sub-committee headed by Mathew Maniangaden, M.P. was appointed to suggest short-term and long-term solutions to the problem of

32 see Karunakaran, 1985 for a detailed examination of these

encroachments and evictions in reserved forests. The recomrnendationsof the Committee favoured the cultivators within forests and the distinction between lease holders and encroachers were sought to be eliminated. It even recommended assignment of forest lands to non-tribals residing within tribal colonies.

Following the Maniangaden Committee's report, the Government ordered that settlers prior to 1.1.1968 would have their rights protected irrespective of whether they are lease holders or encroachers. However, the Government did not agree to assign lands to non-tribal encroachers within tribal colonies in forests.

Whereas the Anti-erossion Committee and the Forest Preservation Committee were conservation oriented, the Maniangadan Committee was farmer oriented. Even while the Maniangadan Committee report was being considered by the Government an officer from the Revenue Department, was appointed to prepare a list of arable lands within reserved forests to assign to the landless. The failure of land reform measures to secure substantial land for redistribution among farmers was a contributing factor for this venture. The Special Officer, Anandan Pillai, recommended that an area of 1,17,273 ha. was available for cultivation within the reserved forests. Due to objections from forest officers and practical difficulties, only 15,071 ha. was sanctioned under the Arable Land Scheme. Out of this more than half (8,074 ha.) was subsequently diverted for other purposes such as, rehabilitation of evicties from project areas, ex-servicemen's cooperative farm, collective farm, Gwalior Rayons (485 ha.) , cashew plantations, etc[33].

The Private Forest (Vesting and Assignment) Act of 1971, apparantly a conservation legislation was infact promulgated as a land reform measure. Initially, one third of the forests taken over was intended to be distributed to the landless[34].

Changes in the political scenario also saw a lack of commitment to conservation. This pervaded to almost all levels of people from the top policy makers to the common farmer. The reason for this state of affairs was a belief in the inexhaustibility of forests. The area under forests was roughly half of the geographic area of the state at the beginning of the twentieth century[35] and it remained fairly unchanged for more than half a century. Of course plantations were developed in the hills but they were far removed from the settlements and after the coffee blight[36] in the early phase of the plantation era (1868 to-say 1880) planters were very cautious in taking up plantations so that there was no perceptible deforestation. Due to inaccessibility and the strict implementation of rules regarding trespass into reserved forests prior to the Second World War, very few people from other areas did actually visit the forests. Therefore it is not surprising to expect that people believed that forests extended infinitely and as a corollary there was no harm in clearing some for any immediate purpose[37].

There was a steady stream of government programmes encouraging settlements in the forests from early 1940's up to early

33 Government of Kerala 1977.

34 Government of Kerala 1975.

35 Karunakaran 1985.

36 Baig and Henderson 1978, Fletcher 1911

37 Popular Malayalam literature makes heros out of small farmers struggling against wild forest. S.K. Pottakad, Muttathu Varkey are some of the authors

1970;s so that it was inevitable that a spill over in the nature of 'encroachments' would take place[38]. Various Commodity Boards such as Rubber, Coffee, Tea and Cardamom supported the expansion of these crops traditionally raised in forested areas. In fact there was no consistent policy on forest land use by the state government that statements to the effect that no more forest lands will be assigned to encroachers after each regularisation order, is never taken seriously by the farmers[39]. "Cut off dates for regularising encroachments in Kerala have been revised from 1.4.1957 to 1.1.1968 and then to 1.1.1977. Periodic revision of dates gives a feeling that at some future date this process will be repeated and irrespective of when encroachment had taken place it will be regular/sed"[40].

Neglect of Boundary demarkation

Development planning in other sectors and their demands on forest lands disrupted the compactness of the reserved forests. Large investments were made in electricity generation schemes funded by USAID (the Sabirigiri project), the Canadian Government (Idukki) and several other irrigation and power projects were taken up in the post independence period. Hydel projects not only required clearance of the reservoir area but also roads to transport construction materials. Accessibility development which was a constraint in forest utilisation was removed and various Government and private plantations came up all along as the roads developed. During the Grow More Food

38 See notes of dissent by K M Chandy and K I Velayudhan in Report of the Forest Preservation Committee (Radhakrishna Menon et al 1962)

39 Joshi 1987, Karunakaran 1985

40 Nair 1985 20

Campaign, extensive stretches of road margins and stream banks were released for cultivation[41]. These settlements continued and expanded making it impossible to implement the trespass rules within reserve forests.

During 1956-57 it was ordered by the government that each forester must submit a certificate every month that no new encroachment has occurred during the period. If encroachments are reported he has to take on the tricky task of taking action against the dffenders. As official transfers of forest land to the Revenue Department and periodic regularisation of encroachments have not been followed by survey and demarkation on the ground and notification of fresh forest boundary line according to the Forest Act, it is easy for the encroachers to claim that they had occupied the land before the latest cut off date on the evidence of older coconut tree seedlings transplanted from elsewhere and the use of time worn second hand building materials in their houses. Local witnesses will also be forth coming to vouch for encroachers. As encroachers often have political backing and can obtain stay orders from the government or courts even forest officers consider it prudent to accept the claim of the encroachers and certify that all encroachments have taken place prior to the cut-off date[42]. Though, the design of permanent cairns for demarkation of forest boundaries was finalised in a departmental meeting in 1963, it took nearly two decades to commence construction of the same. Funds were not a problem earlier as can be seen from the lapse of large sums during each year[43]. The problem essentially was the lack of political support.

41 Radhakrishna Menon et. al. 1962

42 Viswanathan 1992:90.

"One of the direct results of the changes brought about during the period of turbulence is the obliteration of legally notified boundaries of the Reserve Forests, more particularly in the Travancore Cochin area. It is also common knowledge that the policy of the government in redefining the forest boundaries periodically on the basis of cut off dates arbitrarily fixed had only helped the perpetuation of the problem until it was decided to evict all occupations that took place after 1-1-1977. This was followed by a fresh demarkation of forest boundaries after a joint inspection of the areas by the Revenue and Forest officials. As the only criterion for fixation of the new boundary was the exclusion from the forests, all areas that came under occupation prior to the cut off date of 1-1-1977, no attention whatsoever was paid as to whether the new line would be conducive to the needs of forest conservancy and preservation, or convenient from the point of surveillance and sustained maintenance. The result was that the new boundaries have become extremely sinuous and enormously long in the area concerned. This disadvantages not with standing, the legal status of these new boundaries would remain questionable until they are surveyed and notified according to the requirements of the law. This is a problem of colossal magnitude and it poses a continued challenge to the forest management"[44].

Nationalisation of Private Forests

Prior to independence Malabar had extensive private forests. The extent of private forest holdings in Malabar was estimated to be

43 Karunakaran (personal communication).

44 Viswanathan (personal communication).

3106 Km^2 in 1945, owned by 116 Jenmis or Devasoms[45]. Large scale clearance of private forest holdings was noticed after World War II and consequently the Government of Madras enacted the Madras Preservation of Private Forest Act (MPPF) in 1949. This Act was conservation oriented. Tree felling or alienation of land through sale, mortgage or leasing of private forests without the prior permission of the District Collector was prohibited. Due to the nonexistence or inadequacy of an implementing machinery and the unsurveyed nature of the private forest holdings the objectives of the Act were not fulfilled. The demand for land from immigrant farmers from Travancore and the insecurity of the owners resulted in clandestine deforestation and widespread conversion of forests to agriculture. Rapid clearance of private forests in Malabar enhanced wood production. The Kallai timber market which was a traditional export centre for teak logs, got a boost with large arrivals of timber. Many processing units such as saw mills and plywood factories came up after the Second World War around Kallai.

The National Forest Policy of 1952 envisaged the take over of private forests by the Government after paying compensation to the owners. The Kerala Assembly passed a Bill in 1962 for the take over of private forests in Kerala after compensating the owners. As the bill did not yet President's assent, it lapsed[46]. Most of the private forest owners, therefore, were keen to sell off the trees or the forests at the best possible price before Government take over.

---

45. Viswanathan 1992.

46 Karunakaran 1985: 241

Land reforms seeking to redistribute large holdings among the landless and agricultural labourers was an important agenda of the Government since late 50's. The Kerala Land Reform Act 1963 exempted private forests and plantations from the purview of the ceiling limits the surplus lands that became available for redistribution was meagre and insufficient in relation to the demand from agricultural labourers. "Therefore Government decided to take over the private forests also as part of agrarian reforms in order to distribute part of it to agricultural labourers and to utilise the balance portion for the promotion of agriculture and for the welfare of the agricultural population of the state"[47].

In Travancore and Cochin the remaining private forests were uncultivated patches within large estates of tea, coffee, etc. In many areas plantations expanded into the remaining forests. Within the Kannan Devan Hills Concession in Munnar[48] extending to around 588 km^2, 270 km^2 of forests existed[49]. In January 1971 the Kerala Government enacted the Kannan Devan Hills (Resumption of Lands) Act as a measure of land reform without paying compensation. Areas left uncultivated included Mankuklam forests and the crest of the Anamudi Hills which was preserved as a hunting reserve. Much of

47 Manoharan 1989:4.

48 John Daniel Munro, a grandson of a former British Resident (Col. Munro), an officer of the Travancore Government obtained two concessions from the Poonjat Raja which was ratified by the Travancore Government in 1879. J.D. Munro along with Gribble Turner of the Madras Civil Service and A.W. Turner formed the North Travancore Land Planting and Agricultural Society which later became the KDHP Co. Tea became the major crop after coffee and cinchona failed (Baig and Henderson 1978).

49 Chandrasekharan 1973: 86.

the Mankulam area has been encroached or assigned to farmers subsequent to the take over. Some cardamom plantations raised by encroachers were evicted and entrusted to the Kerala Forest Development Corporation. A special Division is functioning to look after the remaining forest area. In the upper grassland shola forests around Anamudi, the Eravikulam National Park was established in 1978.

In May 1971 the Kerala Government, by an Ordinance, took over the remaining private forests. The Kerala Private Forests (Vesting and Assignment) Act 1971 followed. On a petition challenging the KPF (V and A) Act 1971 the Kerala High Court in June 1972 held that the Act was not constitutionally valid. Immediately to safe guard the forests, the Kerala Government promulgated the Kerala Preservation of Private Forest Ordinance which was replaced by an Act in the same year. Again due to field level problems and lack of administrative support, this Act was not effective enough to protect the forest. The Supreme Court on an appeal by Kerala Government finally upheld the KPF (V and A) Act 1971 in September 1973. "In many respects, particularly the scheme of agrarian reforms envisaged in this last mentioned Act is closely parallel with the Kannan Devan Hills (Resumption of Lands) Act 1971"[50]. Shri T. Madhava Menon IAS was appointed as Special Officer with the rank of Special Secretary to'the Government of Kerala, to implement the Act. A Vested Forest Committee was constituted with the Special Officer as the Chairman. For the settlement of disputes under the Act three Forest Tribunals in the rank of District Judges were appointed. On receipt of the interim

50 Government of Kerala 1975.

report of the committee the Government ordered that one third of the vested forest should be made available for cultivation. The final report of the committee included proposals specifying the areas for permanent reservation and areas for assignment. Several tribal co-operative farms were developed in the vested forests. As the Act exempted cultivated areas and non-forestry plantations, large tracts of private forests in different stages of conversion became beyond the purview of the Government take over. Due to the unsurveyed status of the private forests and lack of proper Government records, Tribunals set up under the Act ordered release of several holdings which were contested.

It must be noted that while the objectives of the Madras Preservation of Private Forests Act was forest conservation, that of the Kerala Private Forests (Vesting and Assingment) Act was to facilitate conversion of forests to agriculture. The take over of the Private forests under the KPF(V&A) Act as a land reform measure enabled the government to confiscate the forests without having to pay any compensation to the owners. However, exemptions were allowed in the case of lands which were used principally for the cultivation of tea, coffee, cocoa, rubber, cardamom, cinnamon and cashew and lands used ancillary to the cultivation of such crops or for the preparation of the same for the market. Garden lands and ***nilams*** as defined in the Kerala Land Reform Act 1963 were also excluded. Further the owners were allowed to retain private forests up to the limit provided in the KLR Act for personal cultivation.

These exemptions had the effect of selectively penalising forest owners. While those who abided by the MPPF Act and preserved the

forest suffered confiscation while those who cleared the forest for agriculture or converted them to plantations were allowed to retain them. Curiously plantations of forestry crops were not exempted. The total extent of private forest taken over under the Act up to March 1986 is 1882 Km^2 of which only around 60 Km^2 has come from Travancore and Cochin areas[51]. One of the large private forest holdings belonged to Nilambur Kovilakom. Not only were they preserving the forests and managing it in a systematic manner"[52], they volunteered to sell the forests to the government. Part of their holding which lay in Tamilnadu after States re-organisation was purchased by Tamil Nadu government, whereas their holdings in Kerala were confiscated. From the forest conservation angle such action give the impression that government policy penalises those who conserve the forest while those who violate the law and clear the forest stand to gain. The frequent regularisation of encroachments in reserved forests also serve to reinforce the impression.

Although the KPF (V and A) Act enjoined the government to survey the vested forests and demarcate the exempted areas and areas earmarked for assignment to cultivators, there occurred serious delay in initiating the field survey. This delay contributed to further loss of forests as agricultural holdings and plantations within the vested forests expanded their boundaries[53].

Survey and demarkationwith three survey units under a Deputy Director of Survey and Land Records continued up to 1978. "But

51 Manoharan 1989

52 See for example Irwin 1936

53 Viswanathan 1992.9

before completing the survey and finalising the survey records the survey units were dismantled by the Government. Hence boundaries of Vested Forests could not be finally settled and disputes continue to persist, increase and aggravate, giving room for easy encroachment"[54].

The situation is further complicated by Land Tribunals generously issuing 'pattayams' (title deeds) without giving proper boundary descriptions. Several cases have ensued when the Vested Forest administration challenged the pattayam holder's claim to occupy vested forests. With the nationalisation of the private forests of Malabar and the restrictions on timber felling[55],the Kallai timber market declined.

Industrial Orientation

The growth of the plywood industry is linked to the policy of boosting the export of tea which became a major foreign exchange earner during the First World War. The price of imported plywood rose to high levels consequent to the War. A few companies started plywood manufacture in Bengal[56] since 1917. In Kerala plywood production was initiated in 1937 by Standard Furniture Co., Kallai, established in 1920. Another unit in Chalakudi was also started by the same company in 1943. In the same year Malabar Plywood

54 Manoharan 1989a

55 Particularly The Kerala Restriction on Cutting and Destruction of Valuable Trees Act 1974 (Repealed and replaced by an ordinance), Kerala Forest Produce Transit Rules 1975 etc

56 Nagaraju & Venkata raman 1986

works, Feroke, and the Government owned Travancore Plywood Industries, Punalur was started. Several other factories came up subsequently. The most modern plywood plant in India, Western India Plywood Ltd., was started in 1945 at Baliapattom in Kannur District[57]. While the factories in Malabar obtained the bulk of their requirements from the private forests, those in Cochin and Travancore were supplied from the reserved forests. After the formation of Kerala State, plywood industries obtained a quota of timber allotment from the reserve forests on the recommendations of a Committee consisting of a representative each of the Industries Development Commissioner, the Chief Conservator of Forests and the Indian Plywood Industries' Research Institute[58]. During the mid-sixties "the softwood quota allotted to the plywood industry came very near the actual requirements because of large scale clearance of the catchment areas of the hydro electric schemes like Pamba, Kakki and Idukki"[59]. By the middle of 1970s a wide gap between the demand and supply of raw materials to the plywood units in Kerala was noticed[60]. The accelerated expansion of capacity in the wood based industries in Kerala was the primary reason for the under utilisation of capacity in the industry. Since late 1970s several firms started using wood from Andaman Islands. With the liberalisation of wood imports by including wood in the Open General License (OGL) category in late 1980s, logs from Malaysia and other countries came to be increasingly used by large firms

57 Chirayat 1966

58 Industries Development Commissionerate 1977

59 Chirayat 1966 105

60 KFRI 1977 18

The growth of industries and government commitments to supply a predetermined quantity of raw material from the forests did as much damage as the war. In the competition between states to attract industries often unrealistic commitments are made. These commitments are formal, legally enforceable contracts for the industries, that, like war supplies they have to be met irrespective of whether they represent the sustainable yield. Price subsidies in the form of a negotiated pre-fixed price or exclusive quotas are a distinctive feature of the commitments[61].

The industrial orientation of forestry began with the National Forest Policy of 1952. The policy statement included industries in the highest priority class along with defence (understood earlier as teak timber for ship building, gun carriages etc.) and communications (railway supplies). Forest based industries were encouraged even earlier in Travancore. The first law enacted in Travancore to facilitate the setting up Joint stock Companies in 1887-'88was to facilitate the setting up of Punalur Paper Mill, to produce paper using reeds[62].The investment policies followed in the Five Year Plans also favoured expansion of plantations particularly pulpwood and matchwood plantations. Eucalyptus raised even in the fuel wood scheme were allotted as pulpwood as the commitments could not be met from the industrial plantations alone [63]. Bombax plantations raised for the small scale

61 In agreement dated 27.10.1988 between the Government of Kerala and the Gwalior Rayons Company it is provided that "where the supply of raw material by the Government is less than the agreed quantity of 2 lakh tonnes in any year, the Company is entitled to claim cornpensaton"(p.4).

62 Namboodiripad 1968

63 Krishnankutty and Chundamannil 1985.

match industry during the first few plans are also being diverted to the pulp industry to satisfy commitments to the pulp industry made earlier[64].In dealing with the Government, large scale industries have an advantage since they can afford to secure the best legal talents to represent their interests during arbitration or in litigation. It is not uncommon to see retired Chief Justices and former Chief Ministers appear on behalf of private industrial concerns[65]. Retired forest officers joining private forest based industries is quite frequent. In the public sector, the Chief Secretary has been a member of the Board of Directors of Hindustan Newsprint Limited. This may affect other forest produce consumers in situations where the resource is scarce[66].

At the international level forestry came to be identified with industries that multinational organisations propagated the slogan of forestry for industrial development[67]. It was the recommendation of von Monroy, an FAO expert, that initiated the scheme for large scale plantations of fast growing species for the pulp industry[68]. It was

64 "In the case of reduction or diminution of the quantity of Eucalyptus, the deficit in quantity shall be met by supplying bamboo and debarked Bombax malabaricum. When Bombax is offered it will be in quantities of not less than ten thousand tonnes allotted at a time and shall not involve selection felling." Agreement between Government of Kerala and Gwalisr Rayons Co. dated 27.10.1988.

65 The former Chief Justice of the Madras High Court appeared for the Gwalior Rayons Company in arbitration proceedings against the Government of Kerala. Sidhartha Sankar Ray, former Chief Minister of West Bengal appeared in the Kerala High Court for the same Company and was successful in striking down an ordinance providing for the State take over of the Company.

66 Chundamannil1990.

67 See Westoby 1963 and King 1968.

68 The target of von Monroy (1961) during a ten year period was 0.6 million ha.

another UNDP programme that funded the Pre-investment Survey of forest resources which led to the establishment of the Hindustan Newsprint Limited in Kerala[69].

The Report of the National Commission on Agriculture[70] saw the climax of the phase of industrial orientation of forestry. The Commission was of the opinion that "production of industrial wood would have to be the *raison d'etre* for the existence of forest"[71]. The Commission, while recommending an aggressive man made forestry programme, advised that "future production programmes should concentrate on clearfelling of inaccessible hardwood forests, followed by that of mixed quality forests and valuable forests and planting with suitable fast growing species yielding higher returns per unit area. The resulting produce from clearfelled areas should be utilised in wood based industries as far as possible"[72]. The Commission recommended formation of state owned Forest Development Corporation in each state to accelerate the industrial plantation programme and quotes extensively from a letter to the editor of Indian Forester, written by a Ford Foundation consultant in India, justifying the inclusion of income from clearfelling operations that precedes creation of man made forests as a project benefit so as to make it attractive to lending agencies for funding. However, the preferential treatment of industries suffered a setback when a pioneering legislation was

69 "Two potential mill sites were identified sufficiently close to these two areas of plantations to draw upon them - one at Piravam and one at Chewara" FAO of the UN 1970 37 "It is understood that the Fourth Five year Plan includes two principal industrial proposals of the project - namely the production of news print from eucalyptus in the southern zone" UNDP and FAO 1970 9,

70 Government of India 1976

71 Government of India 1976 32-33

72 ibid p 71

enacted in Kerala, The Kerala Forest Produce (Fixation of selling Price) Act 1978. The government could now revise the price of raw materials supplied to industries under a quota or agreement. Provision was made to exempt public sector enterprises such as Hindustan Newsprint Ltd. and Kerala State Bamboo Corporation from the minimum prices fixed[73]. Prior to 1978, industrial wood was supplied to large units on a nominal seignorage rate from forests and to small units from forest depots under a quota system. Since the 1978 Act government fixes the selling price of bamboo, eucalypts, and most plywood species annually taking into consideration the cost of production, open market price etc.

Forest based Corporations

The earning of foreign exchange was a priority for the government and export oriented crops were given special treatment in the matter of extension, credit and subsidies. Several public sector plantation ventures were started to raise a range of crops like rubber, oilpalm, eucalypts, cardamom, tea and even sugar cane in forests. Plantation Corporation of Kerala, Rehabilitation Plantations Ltd, State Farming Corporation of Kerala, Oil Palm India Ltd, Kerala Forest Development Corporation etc. are among the prominent.

The first public sector corporation set up to raise commercial plantations in forests was the Plantation Corporation of Kerala in 1962. The Forest Department had initiated the planting of Rubber near Chalakudy in late 1950's. The new corporation formed under the

73 Madhava Menon et. al. 1986:32

Agriculture Department was entrusted with the management of the plantations and had an ambitious programme of expansion. The capital for the venture was obtained from the sale of timber from clear felling natural forests in plantation sites[74]. This was prior to the National Commission on Agriculture recommendations on setting up of Forest Development Corporations. The PCK has 7 rubber estates and 5 cashew estates covering 11,709 ha. all over Kerala.

State Farming Corporation of Kerala was formed in 1972 to grow sugar cane for a sugar mill in the co-operative sector. As part of a package to revive the chronically sick Mannam Sugar Mill in Pandalam the committee set up by €he Government of India suggested that the Kerala Government, seeking a loan of Rs. 150 lakhs, find means of supplying sufficient sugarcane for the mill[75]. Due to the relatively low price offered and irregular payments, farmers in the neighbourhood of the mill had shifted to other crops. The Kerala Government decided to set up SFCK attached to the Agriculture Department to raise sugarcane in cleared forest lands in Punalur Division. The programme was a miserable failure due to various reasons including accumulation of dues by the sugar mill. Sugar cane cultivation was abandoned and for a time cashew, coconut, pineapple etc. were tried. Part of the lands were also leased for taungya cultivation to obtain some revenue. Finally a loan was obtained from NABARD under the Western Ghat Development Programme to raise rubber plantations. The Accumulated losses up to 1986-87 was 313 lakhs[76]. The SFCK manages 2467 ha. of cleared forest lands.

---

74 Budget for the year 1959-60. Speech of the Finance Minister C Achutha Menon. Government Press Triandrum.

75 Report of the Committee on Mannom Sugar Mills Ltd. 1971 (mimeo).

The Kerala Forest Development Corporation was formed in 1975 to raise pulpwood for the public sector Hindusthan Newsprint Ltd. Although only a fraction of the target for raising pulpwood has been achieved, the KFDC has diversified to a variety of crops including industrial softwood, cardamom and tea. The target for pulpwood plantation of KFDC was 40,000 ha. Only 8,673 ha. could be planted, of this 2,769 ha. was raised in the grass lands. Teak mixed with bombax or Ailanthus has been raised in 1,116 ha. cardamom plantations account for 1,910 ha. The other plantations of KFDC are *Gmelina arborea* 553 ha. *Albizia falcataria* 747 ha. tea 90 ha. and miscellaneous plantations 153 ha[77].

The Rehabilitation plantation Ltd. was formed in 1976 for resettling repatriates from Sri Lanka. This Corporation is under the ministry of Labour and Rehabilitation. Excellent rubber plantations have been raised in Punalur under the able supervision of an officer of the Forest Department[78] who was also associated with the Rubber plantations in Chalakudy.

Oil Palm India Ltd. is another corporation set up as a joint venture by the Government of India and the Government of Kerala in 1977 to raise Oil palm. The plantations in Punalur Forest Division (3,646 ha.) is expected to reduce the dependence on imports of edible oil,

---

76 Bureau of Public Enterprises, 1988.

77 Surendran 1991; Government of Kerala 1991 shows slightly different figures.

78 G. Moni, Conservator of Forests.

Social Forestry Programme

A Social Forestry Programmesto supply fuel wood, fodder and other rural requirements which were neglected in earlier periods was recommended by the National Commission on Agriculture. Following the report of the Commission, several States initiated ambitious social forestry programmes availing generous loans from International Aid Agencies and the World Bank. The Kerala Social Forestry Programme funded by the World bank has a target of planting 85,300 ha with a tree density of 4,900 per ha in public and private lands, Other plan schemes such as National Rural Employment Scheme, Rural Fuel wood Scheme, Rural Landless Employment Guarantee Programme and Drought Relief Scheme have been utilised for social forestry. A Review of the programme by the Estimates Committee of the Kerala Legislature show that the emphasis has been on fast growing exotic species and that 390.8 lakh seedlings have been distributed to farmers up to 1986-87[79]. Against a target of 0.85 lakh ha the achievement was 0.98 lakh ha[80]. Among plantations raised under the World Bank Aided Social Forestry Project, Large Block Plantations were 15841 ha, Small Block Plantations were 2087 ha, Strip and Coastal Plantations were 776 ha, Tribal Fuelwood Plantations were 1592 ha and Tribal Mixed Plantations 113 ha. The achievements in respect of other schemes were as follows: Rural Fuel wood 13286 plus 540 ha, National Rural Employment Scheme 9536 ha, Rural Landless Employment Guarantee Programme 2690 ha, all of which were in large block plantations[81]. A survey by KFRI, of the

79 Kerala Legislature Secretariat 1989

80 Tewari 1991.

plantations raised under the World Bank aided Social Forestry Programme in forests and public lands, reported that survival rate of seedlings range from 80 percent at 1.5 years and shifts to around 60 percent in later years[82]. The survival rate of seedlings supplied by the Social Forestry Wing and planted in house compounds in 1987 was estimated[83] as 38.5 percent by a survey in 1990.

Tribal Welfare

Before independence, the tribal population which inhabited the forested frontier areas of Malabar, Cochin and Travancore which form part of present day Kerala were left mostly undisturbed. Tribals were required to hand over valuable items such as ivory and collect minor forest produce and bring them to depots of the State or its contractors The State and the Forest Department had a patronising attitude towards tribals as they were a reserve of labour in inhospitable areas and valuable informants on poaching and smuggling of forest produce. Developments in the timber market saw a shift in the focus from Royal trees to Reserved trees and then to Reserved Forests with accompanying changes in the intensity of timber extraction, that the earlier privileges of tribals were reduced to concessions.

When forests were extensive, the tribals could shift to other areas when plantations of coffee, tea, cardamom and rubber replaced forests. Food production leases in forests to non tribals and large scale immigration of plainsmen reduced the tribals almost to the

81 Chand Basha 1991.

82 Jayaraman et al 1992:22.

83 Department of Economics and Statistics 1992:20.

status of landless vagrants. Restoring the rights and lands of the tribals would involve disturbing the settlers and planters, who not only are a powerful political force but also belong to the same non tribal category as politicians and most officials.

The rights of tribals were formally recognised in the Travancore Hillmen Settlement Act of 1939. Cochin also had a similar legislation. With the consolidation of laws after the formation of Kerala, the Kerala Hillmen Rules of 1964 was notified under the Kerala Forest Act of 1961. This was in fact a restatement of the rights enjoyed earlier. However, the Kerala High Court struck down the rules as being beyond the constitutional competence of the State Legislation. "Subsequent to this decision non-hillmen in large numbers infiltrated into the hillmen settlements either by marriage alliance or by unlawful occupation on petty consideration"[84]. Although government issued directions for eviction of non tribals from tribal settlements, it was not implemented A new Act, the Kerala Scheduled Tribes (Restriction on Transfer of Lands and Restoration of Alienated Lands) Act 1975 was passed. "Due to various reasons the Rules were framed only in 1988 but implementation has yet to wait"[85].

With the striking down of the Kerala Hillmen Rules framed under the Kerala Forest Act 1961 and the formation of a separate Department of Tribal Welfare, the Forest Department has been absolved of the responsibility to tribals. However, the tribals continue to enjoy certain concessions with regard to cultivable lands and minor forest produce.

---

84 Karunakaran (1985b:206).

85 Chand Basha 1992

Forest Loss

Reports of forest loss and degradation both at the global and national level began to appear since the late 1970's. The National Remote Sensing Agency reported that the forest loss in Kerala was of the magnitude of 1,200 sq.km. per year between 1972-75 and 1980-82[86]. The Forest Survey of India made a revised estimate based on 1985-87 satellite imagery which showed a decrease of 253 km2 from the estimate of 1982, which is explained as the correction of an earlier error where "tea gardens in Idukki District which occurred in the vicinity of the forests were counted as forests"[87]. The Pre investment Survey of Forest Resources[88] estimated that the forest lost between 1940 and 1970 in Kerala was 3,450 km^2 while between 1960 and 1970 alone it was 1,020 km^2. The Centre for Earth Science Studies[89] estimated that the loss of forests in Kerala between 1905 to 1965 as 6,400 km^2 and between 1965 and 1973 as 4,100 km^2. Several criticisms of forest management also appliied in the 198O's[90].

---

86 CSE 1985

87 Forest Survey of India 1990 54

88 Chandrasekharan 1973

89 Chathopadhyay 1984

90 There has been serious criticism of the practice of forestry "Scientific forestry is at best a vague and confused system of claims while at worst it is the vehicle of ruthless and destructive exploitation of the forests" Shiva and Bandopadhyay (1980) See also Nair (1985), Fernandes and Kulkarni (1983) contains several articles See articles by Walter Fernandes, K P Kannan, Sarad Kulkarni, Madhav Gadgil

Reservation of forests, enactment of forest laws and establishment of a forest service are necessary for sustainable management of forests. However, they are insufficient to ensure sustainability[91] . For example, forest officials have the power to confiscate tools and vehicles suspected to be involved in forest offenses under section 61A of the Kerala Forest Act 196I[92]. Inspite of stringent forest laws, due to institutional constraints, outdated proceedures and tardy implimentation, the protection of forest territory and produce suffered serious set back[93].In order to tackle forest offenses more effectively Forest Stations, on the line of Police Stations, are being set up[94] since 1988. Although petty offenses can be tackled, no effective system exist yet to counter mass encroachments with the connivance of politicians and officials[95] or, industries and public sector organisations can still get away with further concessions of forest produce or forest lands from an obliging State or Central Government notwithstanding the Forest Conservation Act[96].

91 Chundamannil 1992.

92 Government of Kerala 1976.

93 Viswanathan 1992.

94 Joseph 1989.

95 G.O MS No. 172 (92) RD Dated 3-3-92 liberalises the conditions for claiming occupation of forest lands prior to the current cut off date of 1-1-1977 for farmers seeking title deeds in reserved forests.

96 Chundamannil 1988.

THE ASCENT OF CONSERVATION

Thirty six years after the First Forest Policy of independent India a new Forest Policy was declared in 1988. The Forest Policy of 1988 is a radical departure from the 1952 Policy. The 1952 policy was essentially the same as the Forest Policy resolution of 1894 of British India. The only change being the shift to industrial orientation by elevating industries to the top position which was enjoyed by defence and communications earlier. The importance of agriculture was also pegged down. The new Policy is a brilliant document displaying a mature understanding of the current status of the forests and its potential. It states that "The principal aim of forest policy must be to ensure environment stability and maintenance of ecological balance including atmospheric equilibrium which are vital for sustenance of all life forms, human, animal and plant. The derivation of direct economic benefit must be subordinated to this principal aim"[1].

In a major departure frorn the Policy statement of 1952 and especially from the view of the National Commission on Agriculture, the new Policy states "Considering the contribution of forests in maintaining the essential ecological processes and life supporting systems and in preserving genetic diversity. Forests should not be looked as a source of revenue. Forests are a renewable natural

1 Government of India 1988:2

resource. They are a national asset to be protected and enhanced for the well-being of the people and the nation". It specifically mentions that "tropical rain/moist forests, particularly in areas like Arunachal Pradesh,, Kerala and Andaman and Nicobar Islands should be totally safeguarded". On production programmes the Policy directs that it should not "entail clearfelling of adequately stocked natural forests. Nor should exotic species be introduced, through public or private sources unless long term scientific trials undertaken by specialists in ecology, forestry and agriculture have established that they are suitable and have no adverse impact on native vegetation and environment"[2].

The position towards industries was in striking contrast with the view of the National Council of Applied Economic Research (1962). The new policy declared that the practice of supply of forest produce to industry at concessional prices should cease. Industry should be encouraged to use alternate raw materials. In any case the fuel, fodder and timber requirements of the local population should not be sacrificed for this purpose[3]. The National Forest Policy declaration of 1988 has many similarities with views expressed in the Report of the High Level Expert Committee on Forest Policy (1986), appointed by the Government of Kerala.

Forest management in Travancore, particularly in the reserved forests, can be considered as conservation oriented upto 1940. In

2 ibid p.3.

3 The NCAER (1962) recommended that "efforts should be made to divert part of bamboo at present be utilised for local requirements to industry".

1884 a Joint Report on the Administration of the Travancore Forests, was submitted by a Committee consisting of senior officers of the Forest, Revenue and other departments which contained proposals for conserving the forests more efficiently[4], A draft Forest Act on the lines of the Madras Forest Act 1882 was also proposed. The want of a proper map of the forests was noted and a report on all the forests of the country covering timber resources, soil characteristics and suitability of areas for plantation raising was called for. T.F. Bourdillon, Assistant Conservator, who was a member of the Joint Committee, was asked to prepare the report. His classic and exhaustive work The Report on the Forests of Travancore'[5] contains a wealth of information on the status of forest vegetation, management practices in vogue and suggestions for revitalising the Forest Department. The conservation and development oriented suggestions of the report was implemented fairely rigorously untill 1940 during which period both forestry and conservation flourished in Travancore.

In the conservation history of India the year 1969 is notable. The Fourth Plan (1969-1974) Document states that it is necessary to include the environment aspect in planning and development. "Planning for harmonious development recognises the unity of nature and man. Such planning is possible only on the basis of a comprehensive appraisal of environmental issues. There are instances on which timely specialized advice on environmental aspects could have helped in project design and averting subsequent adverse effects on the environment leading to loss of invested resources. It is necessary

4 Government of Travancore 1884.

5 Bourdillon 1893.

therefore, to introduce the environmental aspect into our planning and development"[6]. The General Assembly of the IUCN was held in Delhi in 1969 and recommended that a broad umbrella organisation like the Department of Interior in the United States at the federal level be created under which the conservation administration can be effectively implemented. Earlier a meeting of the representatives of the Planning commission, the Department of Agriculture and the Indian Board of Wildlife recommended the creation of a wildlife wing within the Department of forests both at the Centre and the States. An Assistant Inspector General of Forests was appointed in 1968 to scrutinize wild life matters[7]. A country wide census of the tiger population in 1972 revealed a gloomy picture of the status of wildlife. The Project Tiger was launched in 1973 for the effective conservation of tiger. Periyar Sanctuary in Kerala was included in the programme in 1978.

In 1972 several important events took place of which the United Nations sponsored conference on the Human Environment at Stockholm was the most important. The National Committee on Environmental Planning and Coordination (NCEPC later NCEP) was set up by the Government of India to act as a high level advisory body to government in 1972. In the same year a comprehensive and stringent WildLife Protection Act was enacted by the Government. As Parliament did not have powers to legislate on State-owned forests, which was a State subject, each State had to pass a resolution to adopt such laws.

---

6 CSE 1982:177.

7 IUCN 1969.

Forest was placed in the concurrent list of the constitution during the Emergency period in 1976. This brought about Central control over forests. The World Conservation Strategy launched globally in 1980 was another important landmark in the forest conservation history of India. N.D. Tiwari, Deputy Chairman, Planning Commission was appointed as the Chairman of a high power committee to suggest administrative and legislative reforms to improve environment protection works in the country. A separate Department of Environment, which was created in 1980 on the recommendation of the Committee, was placed under the direct charge of the Prime Minister.

In 1986 The Nilgiri Biosphere Reserve, the first of its kind in India was created comprising of forests in Kerala, Tamilnadu and Karnataka. This was a UNESCO sponsored programme on Man and Biosphere proposed in 1973. In 1975 the Department of Science and Technology of the Government of India established a core advisory group on biosphere reserves. This group has identified 12 potential biosphere reserves in India and has decided to set up two of these namely the Nilgiri and the Namdapha in the first instance[8]. There are 12 sanctuaries and 2 National Parks in Kerala. Half of them were notified in the 1980's (Appendix 2).

To serve the objectives of wild life conservation in sanctuaries, carved out of production forests, timber harvesting has been restricted. Even final felling of teak plantations have to be selectively felled taking out only 25 percent of the mature trees. Clearfelling of

8 Department of Environment, 1980.

plantations at rotation age has stopped since 1985 in Wild life sanctuaries[9]. In 1986 after the reorganisation of the Wild life wing, collection of minor forest produce (MFP) from sanctuaries and National Parks was prohibited by-an order from the Chief Conservator of Forests. The Working Plan of Chimmoni WildLife Sanctuary comments on this order: "This has helped in prevention of movement of humans in sanctuaries and thus avoid many biotic interferences especially fire. But the order has been cancelled and MFP collection has been entrusted to tribal societies"[10].

The Forest Conservation Act 1980 enacted by the Centre assumes wide ranging powers for regulating forest land use decisions. Under this Act the States have effectively lost all powers to modify forest land use for non forestry purposes without the prior sanction of the Central government. Following this Act and due to the pressure of Chipco and other environment agitations[11], restrictions on clear felling of forests were imposed all over India since 1983. In Kerala the Silent Valley controversy was an initial rallying point for environmentalists'[12]. Responding to criticism by environmentalists, expansion of eucalypt plantations has been halted in Kerala in the year 1983-84. Disease problems in plantations,. poor yields and restrictions on clearing natural forests under the Forest Conservation

---

9 Unniyal.1988:55.

10 Kaler 1990:l0.

11 "The unprecedented drought in 1982 (in Kerala) brought in scathing criticism against the Forest Department for mismanagement of forest resulting in ecological disaster. Various organisations, literary stalwarts and poets were unanimous in accusing the forest Department and the inglorious politicians for bringing about such a situation". Karunakaran 1986:108.

12 Chundamannil 1988.

Act 1980 also influenced the decision to stop eucalypt expansion'[13]. Even selection felling which is not controlled by the Forest Conservation Act has been abandoned in Kerala since 1987 due to the pressure of intense activity of conservation groups in the State. The New National Forest Policy Document released in 1988 reflects a very strong commitment to conservation.

It is interesting to note that external factors particularly multinational agencies and experts have influenced the course of forestry in Kerala. Often the problem and remedies comes from the same source. For example aggressive conversion of natural forests to plantations of pulpwood was recommended by von Monroy an international expert and carried out as a plan programme approved by the Planning Commission. The Planning Commission was involved with the decision of creating a wildlife wing within the forest department at the Centre and in the States. It was again the Deputy Chairman of the Planning Commission as chairman of a high power committee recommending the creation of a Department of Environment. External influence was also marked in the conservation history. The IUCN meeting at Delhi in 1969, The UN Conference on the Human Environment at Stockholm in 1972 both attended by the Prime Minister Indira Gandhi, The MAB Programme of the UNESCO, The World Conservation Strategy 1980 have all greatly contributed to the shift from industry oriented forestry to conservation forestry.

13 The High Level Committee to Review Forest Policy appointed by the Government of Kerala also made the same recommendation.

DISCUSSION

The perception of the challenge of forestry differed during different periods. The experience of Kerala highlights the fact that once the initial problems are overcome, there occurs a time lag before which the system identifies the new problems the success has created and recognises the new challenges.

The initial challenge of the foresters was to develop accessibility in the forests and to find markets for the diverse timber. When that was achieved, the next challenge was to develop systems of yield regulation and promote regeneration. As a commercial enterprise when the price of teak, the principal species, was many times more than any other timber and it could be regenerated effectively and cheaply in plantations, it was not worthwhile to waste money on uncertain ventures with even more uncertain markets.

The greatest achievement of forestry in Kerala is creation and expansion of plantations. The persistence of Conolly and the dedication of Chathu Menon has not been in vain. An extensive asset base has been created[14] .However, the success of teak plantations has been taken for granted; the deterioration of quality, perhaps, due to the expansion to the marginal areas or, due to deficiency in management has not been addressed seriously[15] . Despite Kerala's eariy start

14 Appendix 1 gives the growth in area under plantations in Kerala

and achievements, the average quality of the teak plantations is far from satisfactory. A preliminary examination of the Working Plan statistics of 9 Forest Divisions revealed that 44 percent of the plantations were found in the site quality class V which is the lowest class indicating poorest growth[16]. The last two classes together (class IV and V) accounted for around 75 percent of the teak plantations in the same divisions. The Mean Annual Increment obtained in four important teak growing Divisions was 2.604 (Nilambur), 2.518 (Wynad), 2.339 (Konni) and 1.316 (Kozhikode)[17]. These are far short of the expected MAI of even Third Quality plantations[18]. Chandrasekharan (1973) estimated that 82 percent of the plantations had stocking levels over 60 percent. It could be much lower considering the thinning yields[19].

The High Level Expert Committee has observed that "although the technique of teak regeneration is well known there has been na technological advance in the recent past"[20]. An International Teak Symposium was organised by the Kerala Forest Department in 1991 at Trivandrum. In a review of the status of teak in Kerala it was reported that "high targets in teak plantation programme has

15 "..with the stepping up of the plantation programmes under the Five Year Plans it cannot be said that all the subsequent plantations were raised in ideal sites. Plantations done on very steep slopes over extremely shallow soil show stunted growth after an initial spurt of satisfactory increment". Madhava Menon et. al. (1986:16).

16 Jayaraman and Krishnankutty 1990.

17 K.F.R.I. 1979.

18 FRI&C 1970.

19 See KFRI 1979.

20 Madhava Menon et. al. 1986:16.

persuaded the Kerala Forest Department to establish plantations in unsuitable sites"[21]. On the future of teak in Kerala forests , a skeptic scenario was presented, "given that the site quality distribution is skewed to Fourth and Fifth classes and more plantations are in age groups below 30 years (planted on unsuitable sites), the yield from teak is going to come down progressively. Teak plantations will either be covered with miscellaneous growth or turn into irreversible grass-land-scrub with occasional trees as standards"[22].

The increasing divergence between the situation in the field and in the official records is exemplified in the case of irreconcilable variations in the different estimates of area under forests. Field inspections not only of plantations but also of natural reserves on foot and on horse back which involved camping in forests for more than 200 days in the year and which was the forte of the controlling officers of the German tradition have been abandoned. Division and Plantation Journals are often not updated and inspected by senior officers. This change is partly due to the increasing paper work in the office, frequent conferences officers have to attend[23] and the general laxity in administration following Independence[24]. Specifically on forest

21 Chand Basha and Sankar 1991:4.

22 ibid p.5.

23 "A frequent complaint is that conferences and meetings cut into the time available for inspections. We do not accept this plea at all as valid. If an officer is inclined to camp, he still can camp extensively making arrangements for his office work'.Madhava Menon et. al 1986:62.

24 "Sadly the forest Department has been no exception to the general indiscipline that characterizes life in Kerala today. Even Senior Officers are known to stay permanently away from the Head Quarters, the strictures of the rules notwithstanding. This has spread from the top down to the Forest Guards who neglect the beats" and further "The Forest Departments tradition of discipline, cohesion and loyalty is fast becoming a dim memory. Unless once again the

administration, the Kerala State Forest Preservation Committee observed that there has been a marked decline in efficiency during the last decade (1952-'62). Government interventions in routine functions and grant of frequent stay orders undermines the morale, efficiency and usefulness of the staff[25]. The High Level Committee on Forest Policy considers the slow progress in the confirmation of staff and long pendency of disciplinary cases against them as the reason for the low morale in the Department[26]. But the changes had other catalysts too such as the revolution in motor transport. A.A.F Minchin (1931) in his Inspection Notes comments "The old mode of travel made for more contact with the people when the daily march was 8 or 10 miles, something was usually forthcoming to inspect on the way. Now a days we march 20,30,40 miles and report that there was no work on the way". While stating that cars were "engines for piling up travelling allowances" he conceded that travelling was pure and simple wastes less time and that one can come to an inspection at the time of day that suits best and start work without the edge taken out of one's energy. On this, the Chief Conservator R.D. Richmond (1931) comments "There is so much to be said against the use of a car in many divisions, particularly in the case of those cars which are owner driven. Inspection is inclined to be hasty, to be concentrated on those areas served by practicable roads while camping is confined to a few places and then is being lost the touch with the people and

---

Senior Officers stem this rot, the coming generation of forest Officers in Kerala will never be able to restore this tradition". Madhava Menon et al 1986 p. 116-117.

25 Radhakrishna Menon 1962:28

26 Madhava Menon et. al. 1986:62.

the subordinates which is only secured by camping, properly so called. But the motor car is not to be regarded as an inevitable handicap it is for the Conservator to see that their subordinates carry out their duties effectively". The High Level Expert Committee also considered it important to recommend "All officers of the Department should reside at their respective Head Quarters itself as stipulated in the rules. The Senior officers should set example by camping in the forest areas, conducting frequent inspections and generally keeping the high and historic traditions of the Department"[27].

Another point that could perhaps be made is that market orientation of an enterprise makes conservation objectives to be ignored. Obstacles to rapid exploitation or conversion of forests which ensured conservation of forest by default were removed by various external developments. The pace of changes was too rapid to enable recognition of the effects and long term implications. It could be argued that whatever happened was inevitable due to the absence of a firm commitment to conservation of forests and the sustained yield principles by the government. The substantial loss of forests particularly in the post independence period cannot be overlooked. We cannot blame it on colonial administration or emergencies such as war. Part of the fault rests with the forestry establishment in not taking on an active conservationist role in public. An anecdote written by C.C. Wilson merits repetition, "Indeed it is not only the villager that did not understand. At the end of my service when I was the Chief Conservator of Forests in Madras, a very great man,

27 Ibid: 63.

Mr. Rajagopalachari, was the Premier. He send for me and told me that his advisors were pressing him to abolish the Forest Department as being oppressive, expensive and useless. I explained the position to him and urged on him the advisability of refraining from drastic action till he had time to see for himself the working of the department and the results we had achieved in some of the forest reserves. Within six months he was preaching forest conservation wherever he went"[28].

The above quotation points to the communication gap and the credibility gap that exist between the forest department and the people. The social forestry experiment would certainly have improved the situation by opening a channel of communication with the people and elected representatives.

A point that is worth mentioning is that without a sound system of measuring, monitoring and recording the status and changes in the quality of environment it becomes difficult to arrest the deterioration or to change course. What we lacked was a system to keep track of the changes in the forests. The practices of record keeping prevalent in the pre independence period was abandoned. Inspections are often restricted to offices and essential feed back mechanism for decision making has been disrupted.

That some target was being met and certain achievements were being made obstructed the recognition of the cost of such achievement. There was (and still is) no acceptable method of estimating the cost of destruction or degradation of forests. Quality

28 FRI 1961 vol. 1:64.

considerations were relegated to the back ground that sufficient care was not taken during planning, implementing or inspecting. An unfortunate development was the high authority given to financial audit, when no attention was given to performance or quality audit. As there is no system of monitoring of resource stock or quality in the natural forests, the appreciation or deterioration of the stock of forest resources, except in teak plantations, is never checked. Liquidation of the asset base in the form of excessive extraction in natural forests or forest clearance for non forestry purposes would be reflected as increased production or even increased productivity in the accounts. It is not that changes can be easily made, but may be, due to the fear of audit objections, new and daring steps are rarely taken[29].

Initiation of planning at the national level with Five Year Plans and complimentary State level plans reduced the importance of Divisional level Working Plans, where at least theoretically, the annual fellings are based on the growth increment and productivity of the forests. The reduction in importance of Working Plans led to dilution in the rigors of preparation, approval, implementation and enforcement[30].

---

29 Interview with A.I. lyppu retired Chief Conservator

30 "We are however concerned to note a progressive deterioration in the quality of working Plans over time. This is all the more difficult to understand when we consider the reduction in area in many of he divisions. We feel the reasons are many. (a) Working Plan Officers are not selected for the work considering their aptitude, (b) the Working Plan parties are not closely supervised, (c) Data and prescriptions are not researched thoroughly etc." (Madhava Menon et. al 1986:66).

The fact that Working Plans and research are not integrated and that the Working Plan is itself now a defunct document[31] in the actual practice of forestry is one important reason for the triviality of research in forestry. However, corrective mechanisms are at work Vigorous debates on forestry issues in the mass media, reappraisal of ongoing schemes by the Forest Department and researchers, international interest in tropical forestry and most of all availability of funding from a variety of sources for forestry and conservation augurs for substantial improvements. The revolution in information and communication technology with the arrival of computers is bound to have profound changes in forest management. Up dating of records and accessibility to them can be enhanced swiftly by computerizing all records at the range level which can be linked to the Forest Headquarters and the Kerala Forest Research Institute. The High Level Expert Committee on Forest Policy has already recommended such a step[32].

The High Level Expert Committee on Forest Policy appointed by the Government of Kerala laid great stress on forest protection and consolidation of boundaries. They declared that, "the exact boundaries of vast stretches of the forest estates, a basic necessity

---

31 "With the advent of large scale target forestry under the Five Year Plans, the prescriptions of the Working Plans have been set aside making the Working Plan redundant. Consequently the continuity of policies has been lost" (Madhava Menon et. al. 1986:66).

32 "Modern data processing may be made use of to the maximum extent for ensuring accuracy and consistency of data base for Working Plans A sophisticated computer system for storage, retrieval and processing of information should be set up at the Chief Conservator's Office. This should be linked to the National Computer System to facilitate exchange of information with the Forest Research Institutes and Other Forest Departments".Madhava Menon et. al. (1986:126).

for any forest management, are unclear even today despite the fact that special teams have been working the department for several years. A time-bound special programme should be implemented to achieve this. Boundaries shall be demarcated with permanent structure"[33]. It is heartening to note that boundary demarcation has been taken up earnestly during the last few years on the basis of a joint verification of Forest and Revenue departments. Erection of permanent cairns, strip planting with exotic species on boundaries and construction of stone walls in problem areas has been completed in many Ranges. Within the next few years the work which has been a nagging problem for forest management during the period of turbulence and change will be finally solved.

Forestry is much more than growing or selling timber. Forestry gets its 'scientific' cloak only because of the consistent endeavour to achieve sustained yields in perpetuity. The sustained yield frame work is not restricted to production planning. This concept can very well serve in the modern era of conservation also. The sustained yield concept has evolved from the initial emphasis on output and value maximization to the stress on socially optimum yields or optimum sustained yields. The modern definition of the concept is "the endeavour to facilitate the continuous and optimal provision of all tangible and intangible effects of the forests for the benefit of present and future generations"[34]. Sustained yield as a principle of management is prudent and conserves options regarding resource **use** in future. It permits multiple use of forests. It can smoothen the impact of change

33 Madhava Menon et. a11986.65.

34 Wiebecke and Peters 1984.178.

from one level of output or crop composition to another. It has also been a traditional goal in many countries across the globe and is a fundamental principle of modern forest management[35]. Sustained yield management can contribute to conserving the quality of the environment and it is in consonance with the World Conservation Strategy. The new Forest Policy declared by the Government of India, if implemented sincerely, can put the period of turbulence behind and guide forestry in the path of conservation and recovery.

35 Chundarnannil 1986.

Appendix 1

Growth in Forest Plantations in Kerala

Area in ha.

Year	Teak	Bombax and Mixed	Eucalypts	All Plantations
1900	546		—	551
1910	1,685	—	—	1,701
1920	2,879	—	—	2,945
1930	7,859	—	—	8,088
1940	15,258	—	—	15,847
1950	21,820	60	6	23,494
1960	33,121	5,569	275	47,400
1970	53,486	16,924	23,533	101,774
1980	73,927	23,174	32,817	140,283
1990	76,502	31,899	31,609	153,012
1991	76,202	32,729	32,729	153,148

Source: Chandrasekharan 1973, Administration Reports of the Kerala Forest Department, Forest Statistics, 1991

Teak Plantations Prior to 1900

Region	Year	Area (ha.)
Malabar	1876	1,240
Cochin	1891	38
Travancore	1892	270

Source: Karunakaran 1985: 82; Jacob 1933.

Appendix 2

Wildlife Sanctuaries and National Parks in Kerala

Sl. No.	Name	Area km^2	Year of formation	Remarks
1.	Periyar Tiger Reserve	777	1934	In 1950 more area was added and in 1978 declared asa Tiger Reserve
2.	Neyyar Sanctuary	128	1958	
3.	Peechi-Vazhani Sanctuary	125	1958	
4.	Parambikulam Sanctuary	285	1962	In 1973 more area was added
5.	Wynad Sanctuary	344	1973	
6.	Idukki Sanctuary	70	1976	
7.	Eravikulam National Park	97	1978	
8.	Peppara Sanctuary	53	1983	
9.	Thattakkad Bird Sanctuary	25	1983	
10.	Aralam Sanctuary	55	1984	
11.	Chinnar Sanctuary	90	1984	
12.	Chimoney Sanctuary	10	1984	
13.	Chenthurny Sanctuary	100	1984	
14.	Silent Valley National Park	90	1984	

Source: Madhava Menon *et al.* 1986: 42

REFERENCES

Alexander, T.G. *et. al.* 1980. Taungya in Relation to Soil Properties, Soil Erosion and Soil Management. KFRI Research Report No. 4, Kerala Forest Research Institute, Peechi.

Baig, Amita and Henderson, W. 1978. Facets of a Hundred years of Planting, Tata Finlay Ltd.

Balakrishnan, P.K. 1985. Jathi Vyavasthithium Kerala Charithravum. (Malayalam) [The Caste System and Kerala History]. National Book Stall, Trivandrum.

Balasubramanyan, K. 1987. Impact of Selection Felling in a Forest Ecosystem in Kerala, Kerala Forest Research Institute, Peechi.

Bourdillon, T.F. 1893. Report on the Forests of Travancore, Government Press, Trivandrum.

Bright Singh, D. 1944. Financial Development in Travancore 1800-1940 AD. (Ph.D. Thesis). Economics Department, Travancore University, Trivandrum.

Browne, R.S 1936. Working Plan for the Nilambur Hills 1937-38 to 1947-48. Superintendent, Government Press, Madras.

Burkill, I.H. 1965. Chapters on the History of Botany In India. Botanical Survey of India, Calcutta.

Champion, H.G. 1932. The Problem of Pure Teak Plantations. *Forest Bulletin* No 78, Silviculture Series, Government of India Press, Calcutta.

Champion, Harry and Osmaston, F.C. 1962. E.B Stebbings' The Forests of India. Vol IV, Oxford University Press, London.

Chattopadhyay, S 1984. Deforestation in Parts of Western Ghat Region, Kerala, India. Centre for Earth Science Studies, Trivandrum, (mimeo).

Chand Basha, S. 1977. Revised Working Plan For the Palghat Forest Division 1975-76 to 1984-85. Vol I, Kerala Forest Department.

Chand Basha, S. 1991. Social Forestry in Kerala State. *The Indian Forester,* 117(5): 350-365.

Chand Basha, S. and Sankar, S. 1991. The Future of Teak in Kerala. *Paper Presented at The International Teak Symposium,* 2-4 Dec. 1991, Department of Forests, Kerala (mimeo).

Chand Basha, S. 1992. Impact of Forest Policies on Tribal Life. In Encyclopedia of Dravidian Tribes, The International School of Dravidian Linguistics, Trivandrum. (In press).

Chandrasekharan, C. 1973. Forest Resources of Kerala: A Quantitative Assessment. Kerala Forest Department.

Chirayat, J.T. 1966. A Study on the Plywood Industry in Kerala. Labour and Industrial Bureau, Trivandrum.

Chundamannil, M. 1986. Pattern of Investments in Forestry and its Implications on Sustained Yield Management in Kerala, (M. Phil. Dissertation). Centre for Development Studies, Trivandrum.

Chundamannil, M. 1988. Forest Land Use Policy and the Conservation Intent in Kerala, India. *In:* J, Dargavel, K.Dixon and N. Semple (Eds.). Changing Tropical Forests Historical Perspectives on Today's Challenges in Asia, Australasia and Oceania Centre for Resource and Environmental Studies, Canberra: 231-246.

Chundamannil, M. 1990. Inter Sectoral Allocation of Bamboo Resources the Social and Economic issues. *In:* I.V.R. Rao, *ef al.* (Eds.). Bamboos Current Research. *Proceedings of the International Bamboo Workshop held in Cochin,* India 14-18 Nov. 1988, KFRI/IDRC, Singapore.

Chundamannil, M. 1992. Sustainable Use of Forests: Citizens' Rights for Effective Control. *In:* A. Agarwal, (Ed.). The Price of Forests. *Proceedings of the Seminar on Economics of Sustainable Use of Forest Resources.* Centre for Science and Environment, Delhi.

Cleghorn, Hugh, 1861. The Forests and Gardens of South India, W.H. Allen and Co, London.

CSE. 1982. The State of India's Environment 1982: A Citizens' Report. Centre For Science and Environment, Delhi.

CSE. 1985. The State of India's Environment 1984-85, The Second Citizens' Report. Centre For Science and Environment, Delhi.

Department of Economics and Statistics. 1992. Report of Farm Forestry Survey (Social Forestry) Kerala 1991. Government of Kerala.

Department of Environment. 1980. Establishment of Biosphere Reserves in India: Project Document No. 1. The Nilgiri Biosphere Reserve, Indian National MAB Committee, Government of India, New Delhi.

FAO. 1970. India's Pre-investment Survey of Forest Resources. Report on Project results; Conclusions and Recommendations. Rome.

FAO. 1984. Intensive Multiple Use Forest Management in Kerala. FAO Forestry Paper 53, Rome.

Fernandes, Walter and Kulkarni, Sharad. (Eds.). 1983. Towards a New Forest Policy: Peoples Rights and Environmental Needs. Indian Social Institute, New Delhi.

Fletcher, F.W.F. 1911. Sport in the Nilgris and Wynad. Macmillan and Company, London.

Forest Survey of India. 1990. The State of Forests Report 1989. Ministry of Environment and Forests, Government of India, New Delhi.

FRI. 1961. One Hundred Years of Indian Forestry (Vols. 1 and 2). Forest Research Institute, Dehra Dun.

FRI and C. 1970. Growth and Yield Statistics of Common Indian Timbers (Vol. III). Forest Research Institute, Dehra Dun.

Gadgil, Madhava. 1991. Deforestation Problems and Prospects. *In:* Ajay S. Rawat (Ed.). History of Forestry in India. Indus Publishing Company, New Delhi:13-85.

Ganesh, K.N. 1991. Own'ership and Control of Land in Medieval Kerala; *Jenmarn* - *Kanom* Relation During the 16th and 18th Centuries. *The Indian Economic and Social History Review,* 28(3): 299-323.

George, M.P. 1961. Teak Plantations of Kerala. The Indian Forester, 87(11): 646-655.

Gopala Menon, P. 1960. The Silent Valley Reserve: A note on the condition of crop and past management (mimeo).

Government of India. 1976. Report of the National Commission on Agriculture: Part IX Forestry. Ministry of Agriculture, New Delhi.

Government of India. 1988. National Forest Policy. Ministry of Environment and Forests, New Delhi.

Government of Kerala. 1976. Enactments Relating to Forests and Important Rules and Notifications Issued Thereunder. Agriculture (Forest-Special) Department, Trivandrum.

Government of Kerala 1977a. Government Orders and Important Instructions of the Chief Conservator of Forests issued in Connectionwith Taungya Cultivation in Forest Areas. Compiled by C.K. Karunakaran. Government Press, Trivandrum.

Government of Kerala 1977b. Statement of Assignment of Arable Lands as on 1.11976. Government Press, Trivandrum.

Government of Kerala 1975. Report of the Vested Forest Committee. Govt Press, Trivandrum.

Government of Kerala 1991. Forest Statistics 1991. Forest Department, Trivandrum.

Government of Travancore 1884. Joint Report on the Administration of the Travancore Forests, Travancore Government Press, Trivandrum.

Grove, Richard 1988. Conservation and Colonialism: The Evolution of Environmental Attitudes and Conservation Policies on St. Helena, Mauritius and Western India 1600-1854. *In:* Changing Tropical Forests Historical Perspectives on Today's Challenges in Asia, Australasia and Oceania. Centre For Resource and Environmental Studies, Canberra: 19-46.

Guha, Ramachandra. 1983. Forestry in British and post British India: A Historical analysis. *Economic and Political Weekly,* XVII(45 and 46).

Guha, Ramachandra and Gadgil, Madhava. 1988. State Forestry and Social Conflict in British India: A study in the ecological basis of agrarian protest. Centre for Ecological Sciences Technical Report No. 51. Indian Institute of Science, Bangalore.

Industries Development Commissionerate. 1977. Committee Report. Assessment of the Requirement of Softwood timber by plywood manufacturing units in Kerala. Government of Kerala, Trivandrum.

Irwin, H.A. 1936. Report of H.A Irwin. Utilisation and Exploitation Officer to the Government of Madras (retired) Regarding Kovilakam Forests in the Malabar and Nilgris Districts. (mimeo). Nilambur Kovilakom.

IUCN 1969. Eleventh Technical Meeting Papers and Proceedings: Problems of Threatened Species. Vol. 2, No. 18, Morges.

Iyppu, A.I. 1960. Forest Research Activities in Kerala State. *Keralaranyarn,* Kerala Forest Service Publication, Thrissur: 25-28.

Iyppu, A.I. 1962. History of Forestry in Kerala. *Keralaranyarn,* Centenary issue, Kerala Forest Service Publication, Thrissur: 77- 99.

Jacob, M.P. 1933. A Report and Working Scheme for the Travancore Teak Plantations. Government Press, Trivandrum.

James, N.D.G. 1981. A History of English Forestry. Basil Blackwell. Oxford.

Janaki Ammal, E.K. 1956. Introduction to the subsistence economy of India. *In:* William L. Thomas Jr. (Ed.). Man's Role in Changing the Face of the Earth. Vol.I. University of Chicago Press, Chicago: 324-335.

Jayaraman, K; Muraleedharan P.K; and Gnanaharan, R. 1992. Evaluation of Social Forestry Plantations raised under the World Bank Scheme in Kerala. KFRI Research Report 85, Kerala Forest Research Institute, Peechi.

Jeffrey, Robin. 1976. The Decline of Nayar Dominance. Vikas, New Delhi.

Joseph, K.J. 1962. Wealth from Wasteland. *Keralaranyam,* Centenary issue, Kerala Forest Service Publication, Thrissur. p. 91-96.

Joseph, N.M. 1989. Achievements of The Forest Department in Two Years (Malayalam). *Aranyam,* April-June 3-6 and 26-27.

Joshi, S.C 1987. Deforestation in Kerala Causes and Consequences (M.Phil Dissertation). Centre for Development Studies, Trivandrum.

Kaler, Om Prakash 1990. The First Management Plan for Chimmoni Wildlife Sanctuary 1990-'91 to 1999-2000. Kerala Forest Department, Trivandrum.

Karunakaran, C.K. 1975. The Second Working Plan for the Forest Division. Government Press, Ernakulam.

Karunakaran, C.K. 1982. Demand Versus Supply of Important Raw materials from the Forests in Kerala State (Draft). Kerala Forest Department (mimeo).

Karunakaran, C.K. 1985a. Keralathila Vanangal Nootandukalillude. (Malayalam) Kerala Basha Institute, Trivandrum.

Karunakaran, C.K. 1985b. Legislative and Executive Measures for Tribal Welfare in Kerala. Cochin University Law Review: 203-212.

Karunakaran, C.K. 1986. Eco Development of Kerala Forests: Historical Facts. *In:* K.S.S Nair, *et, a/.* (Eds.). Ecodevelopment of Western Ghats, Kerala Forest Research Institute:104-109.

Kerala Forest Department. (undated probably 1977). Teak in Kerala, Trivandrum,

K.F.R.I. 1977. Availability of Wood Raw Materials for the Plywood Industry (Kerala - Karnataka Region). KFRI Report No. 2(1). Kerala Forest Research Institute, Trichur.

K.F.R.I. 1979. Yield from Teak Plantations in Kerala. KFRI Research Report No. 6. Statistics Division, Kerala Forest Research Institute, Peechi.

K.F.R.I. 1992. Kerala Forest Research Institute (Brochure). Kerala Forest Research Institute, Peechi.

Kerala Legislature Secretariat. 1989. On Social Forestry: Fourteenth Report of the Estimates Committee of the Kerala Legislature. Trivandrum.

King, K.F.S. 1968. The Formulation of Forest Development Policies in Developing Countries. Paper Presented at the Commonwealth Forestry Conference, New Delhi.

Krishnankutty, C.N. and Chundamannil, M. 1986: Are eucalypt plantations fulfilling the goals in Kerala? *In:* J.K. Sharma, *et a/* (Eds.). Eucalypts in India - Past, Present and Future. Kerala Forest Research Institute, Peechi: 444-451.

Kunhikrishnan, K. V. 1987. The British Indian Forestry: Malabar Experience (M.Phil. Dissertation). Department of History, University of Calicut.

Little Wood AMC. 1919. DFO Central Coimbatore (Chittoor) Replies to the charges. *In:* Proceedings of the Chief Conservator of Forests No. 12, dated 2 Feb. 1920.

Logan, William. 1887. Malabar, Government Press, Madras.

Lovatt, Heather. 1970. A Short History of the Peermade and Vandiperyar Plantation District. London, (mimeo).

Madhava Menon, T. *eta/.* 1986. Forest Policy and Management in Kerala. Report of the High Level Expert Committee Constituted by The Government of Kerala. Trivandrum.

Madhudevan Nair, R 1984. Travancore under Sir T. Madhava Rao 1858-1872 (Ph. D Thesis). Department of History, University of Kerala.

Manoharan, T.M. 1989. Vested Forests in Kerala. (mimeo).

Manoharan, T.M. 1990. Some Important General Aspects Relating to Forest Department. (mimeo).

Menon, N.N. 1948. Working Plan for the Quilon Forest Division 1944-45 to 1958-59. Government Press, Trivandrum.

Menon, N.N. 1952. A Working Plan for the Konni Forest Division. Government Press, Ernakulam.

Minchin, A.A.F. 1931. Inspection Note on the North Cuddapah Division, Conservator of Forests II Circle, Bellary, 18 August 1931. Proceedings of the Chief Conservator, No 252 Press dated 25 June 1931.

Moni, G 1959. A Short History of the Konni Teak Plantations. *In:* Proceedings of the All India Teak Study Tour and Symposium Dec. 1957 to Jan 1958, Forest Research Institute, Dehra Dun : 164-165.

Moench, Marcus. 1990. From Forest to Agro Forest, (Ph. D. Dissertation). Energy and Resources Group, University of California, Berkeley.

Moench, Marcus. 1991. Politics of Deforestation: Case study of the Cardamom Hills of Kerala. *Economic and Political Weekly,* XXVI(4), January 26: PE47- PE60

Muhammad, E. 1959. Revised Working Plan For The Palghat Forest Division 1959-60 to 1973-74. Kerala Forest Department, Trivandrum.

Nagam Aiya, V. 1906. The Travancore State Manual. Vol. III, Trivandrum.

Nagaraju, S. and Venkataraman, J. 1986. A Study on the Status of Plywood Industry in India. Indian Plywood Industries' Research Institute.

Nair, C.T.S. 1985. Crisis in Forest Resource Management. *In:* Bandhopadhyay *et. a/.* (Eds.). India's Environment Crises and Responses. Nataraj Publishers, Dehra Dun: 7-25.

Nair, K.N. *et. a/.* 1984. Development of Cardamom Plantations in The High Ranges of Kerala. Centre for Development studies, Trivandrum. (mimeo.)

Namboodiripad, E.M.S. 1968. Kerala Yesterday, Today, Tomorrow. **(2nd** ed.). National Book Agency, Calcutta.

Narayanan Nair, P. 1960. Private Forests of Malabar. *Keralaranyam,* Kerala Forest Service Publication: 29-30.

NCAER. 1962. Techno Economic Survey of Kerala. National Council of Applied Economic Research. Government of India, New Delhi.

Pandian, M.S.S. 1985. Political Economy of Agrarian Change in Nanchilnadu The Late Nineteenth Century to 1939 (Ph.D. Thesis). Madras Institute of Development Studies, University of Madras, Madras.

Pandian, M.S.S. 1987. Peasants, Natural Resource Use and State Intervention in Nanchilnadu, 1850-1940. *Economic and Political Weekly,* 22(26) January 27: 1032-1041.

Pearse, J. Kenneth. 1926. Report on Progress and Proposed Future Expansion of the Utilisation of Forest Resources of Madras. Government Press, Madras.

Richmond, R.D. 1931. Proceedings of the Chief Conservator of Forests, Ref. No. 3749/31 dated 28 April 1931.

Radha Krishna Menon, K.P. *et. a/.* 1962. Report of the Kerala State Forest Preservation Committee. Government of Kerala, Trivandrum.

Ramakrishnan, K.V. 1975. Report on Cardamom Lands, Board of Revenue, Government of Kerala, (mimeo).

Ribbenthrop, B. 1900. Forestry in British India. Central Printing Office, Government of India, Calcutta.

Sankaran Nair, K.C. *et. al.* 1975 Report of the Committee Constituted for Examining the Feasibility of Resumption of Cardamom Lands. Board of Revenue, Trivandrum, (mimeo).

Sankaran Nair, K.V. 1960. History of Teak planting in Nilambur. *Keralaranyam,* Kerala Forest Service Publication: 18-21.

Satis Chandran Nair, S. 1988, Long term Conservation Potential of the Natural Forests in the Southern Western Ghats of Kerala. Report to the Man and The Biosphere Committee of the Department of Environment, Government of India.

Shiva, Vandana and Bandopadhyay. J. 1980. Socio Ecological Factors in Choice of Technology for Forest Areas. *In:* Bharat Dogra (Ed.). Forests and People, Himalaya Darshan Prakasan Samiti, Risikesh.

Shiva, Vandana. 1986. The Coming Tragedy of the Commons. *Economic and Political Weekly,* 21(15) April 12: 613-614.

Sreedharan Pillai, N. 1954. Working Plan for the Malayattur Forest Division (part) 1947-'48 to 1961-'62. Government Press, Ernakulam.

Stebbings, E.P. 1922. The Forests of India. Vol. I, Bodley Head, London.

Surendran, P.N. 1991. Highlights of Kerala Forest Development Corporation. *The Indian Forester,* 117(9): 713-720.

Tewari, D.N. 1991. Social Forestry in India. *The Indian Forester,* 117(5): 293-308.

Tewari, D.N. 1992. A Monograph on Teak *(Tectona grandis* Linn. F.). International Book Distributors, Dehra Dun.

Tireman, H. 1920. Inspection Notes on-Chanat Nair Forest. Central Coimbatore Division, Malabar District Conservator of Forest Western Circle. *In:* Proceedings of the Chief Conservator of Forests No. 12 Dated 2 February, 1920 Chief Conservator of Forests S Cox. Coimbatore.

Troup, R.S. 1916. A Note on Some European Silvicultural Systems with Suggestions for Improvements in Indian Forest Management. Superintendent Government Printing, Calcutta.

Troup, R.S. 1917. The Work of the Forest Department in India. Superintendent Government Printing, Calcutta.

Tucker, Richard, P. 1987. Depletion of India's Forests under British Imperialism: Planters, Foresters and Peasants in Assam and Kerala. (mimeo).

Uma Devi, S. 1984. Impact of Plantations on Kerala's Economy with Special Reference to Rubber: Some Historical and Quantitative Aspects (Ph.D Thesis). Department of Economics, University of Kerala, Trivandrum.

United Nations. 1975. Poverty, Unemployment and Development Policy: A Case Study with Special Reference to Kerala. New York, (Reprinted Orient Longmans) 1977.

Unnial, V.K. 1988. The First Management Plan for Parambikulam Wild Life Sanctuary. Kerala Forest Department, Trivandrum.

Varghese, J.C. 1970. Agrarian Change and Economic Consequences; Land Tenures in Kerala 1850-1950. Allied Publishers, New Delhi.

Velu Pillai, T.K. 1940. The Travancore State Manual. Government of Travancore, Trivandrum.

Vernede, C.R., *et. al.* 1884. Joint Report on the Administration of Travancore Forests. Travancore Government Press.

Viswanathan Nair, M. 1962. The Cashew Plantations in Trichur Division. *Kernlaranyam,* Centenary Issue, A Forest Service Publication:106-109.

Viswanathan, T.P. 1958. Working Plan for the Chalakudy Forest Division 1954-55 to 1968-69. Government Press, Ernakulam.

Viswanathan, T.P. 1960. Teak in Travancore a retrospect. *Keralaranyam,* Kerala Forest Service Publication: 8-11.

Viswanathan, T.P. 1983. Kerala Forests - A Diminishing Asset?, *Vanalekshmi,* January: 4-9.

Viswanathan, T.P 1992. Forest Management in Kerala: Problems and Remedies (Malayalam) (Revised 2nd ed.). State Institute of Languages, Kerala, Trivandrum.

von Monroy, J.A. 1961. Report of the Government of India: Integration of Forests and Forest Industries. FAO, Rome.

Ward, Lt. and Conner, Lt. 1863. Geographical and Statistical Memoir of the Survey of Travancore and Cochin States. Vol. 1, Travancore Sircar Press, Trivandrum.

Westoby, J.C. 1963. Forest Industries in the Attack on Economic Underdevelopment. *Unasylva,* 16: 168-201.

Wiebecke, C. and Peters, W. 1984. Aspects of Sustained Yield History - Forest Sustention as the Principle of Forestry ; Idea and Reality, *In: H.K.* Steen, (Ed.). History of Sustained Yield Forestry. Forest History Society, USA: 176-182.

Wimbush, A. 1931. Inspection Notes on the Forests of Palghat Division. Proceedings of the Chief Conservator of Forests No.332/Press dated August 10, Oottacamund.