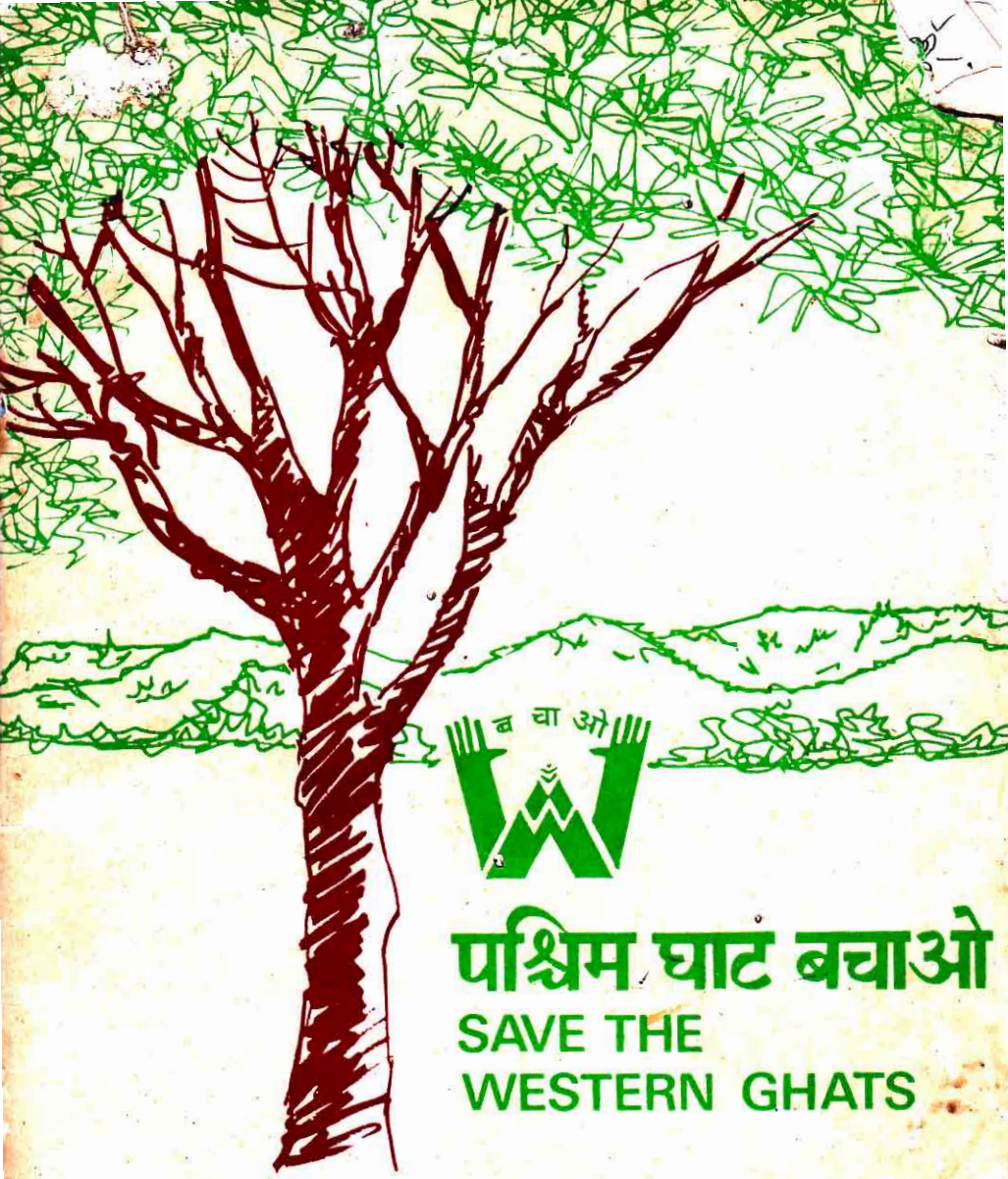

पश्चिम घाट बचाओ

SAVE THE WESTERN GHATS

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Foreword

The Western Ghats extending from river Tapi in the north to the Kannyakumari in the south have played a most crucial role in the ecological balance of the country as well as in sustaining human and animal life in the country for the last several millennia.

The Western Ghats regulate the moisture laden winds coming off the Arabian Sea and recieve in consequence heavy rainfall of 2000 mm or more a year. Due to this heavy rainfall the western Ghats have a natural cover of various types of tropical forests : evergreen, semi-evergreen. moist and dry deciduous, etc The Western Ghats harbour a rich variety of plants and animals.

The Western Ghats are the catchment areas for all the eastwardly flowing rivers like Godavari, Krishna and Cauvery. The forest cover in the Ghats plays a vital role in regulating the flow of these river systems and build the crucial under ground water table of the semi - arid Deccan plateau.

Briefly, the nature so generously endowed us with a precious wealth of resource base in the form of rich plant and animal life, bountiful of water, rich fertile soil and a variety of minerals. If these resources of the Western Ghats were used judiciously, keeping in mind the ecological principles, these would not only have sustained but enhanced the quality of life of millions of impoverished poor in the country.

Unfortunately the faulty development strategy persued over the last several decades has drastically destroyed the rich resource base of the Western Ghats. The Ghats no more harbour lavish fauna and flora - in fact in most parts the

The Western Ghats of India : an Ecodevelopment Approach

The hill areas of India have paid heavily for the mistakes we have committed in our choice of development strategy. Richly endowed with forest and water resources, these are at a serious disadvantage in deriving benefits from modern industry and intensification of agriculture. The few industries that have come to the region have unfortunately proved a curse, rather than a boon, exhausting natural resources, polluting the environment and bringing little benefit to the local population. The fragile ecosystems of the hills have tended to collapse under the assaults of exploitative development of the last few decades.

The resulting situation in the hill areas has naturally roused concern of many people. The response of the development planners has been to make special allocations and call for new approaches to the development of hill areas. The Fifth Five Year Plan called attention to the fact that benefits of development of the resources of hill areas have failed to reach the hill people and suggested that the development schemes should have a beneficiary orientation. The Sixth Five Year Plan showed a greater concern for halting the degradation of the environment and called for an ecological orientation. Evidently, the need is to blend these two approaches. We must plan not only for reducing the rate of environmental degradation but for a positive approach towards environmental restoration in such a fashion as to create greater employment opportunities for the rural population for the task of conservation and augmentation of soil, water and plant resources of the Western Ghats.

The planning Commission launched during the Sixth Plan

Period a scheme for involving the Universities of the Western Ghats region in ecodevelopment oriented action research programmes. Subsequently, this scheme was transferred to the Department of Environment, Government of India for execution, when the scope of the programme was extended to other scientific institutions and voluntary agencies in addition to the Universities. The Department of Environment has constituted a working group to supervise and strengthen this programme.

To meet this challenge, we must first ask a few questions :

(i) What have been the developments thus far on the Western Ghats?

(ii) Can the present trends of development be sustained in the future?

(iii) How have the developments affected the quality of life of the people?

(iv) What should the future directions of development be?

We will attempt to look for answers to these questions sector by sector. However, while discussing each individual sector, we shall pay special attention to the inter-sectorial linkages. We will then attempt an overview of the broad priorities and discuss the institutional arrangements and their implications for resource management. We shall conclude by examining specifically the role of educational and scientific institutions and voluntary agencies, since these are primary concern of the Western Ghats Co-ordinated Research Programme administered by the Department of Environment.

The Setting

The hill chain of the Western Ghats runs parallel to the West coast of India from the river Tapi in the north to the Kanyakumari in the south. The Ghats descend steeply to coastal plains on the west, but merge rather gently through a series of hills with the Deccan plateau. Geologically the Ghats fall into two sections; north of the river Kali is the Deccan trap country of relatively fragile rocks and flat hill tops. The hills do not rise much beyond 1500 m in this tract. South of Kali is the region of precambrian archean crystalline rocks which are much harder. The hills tend to be rounded end rise to 2000 m or more.

The Western Ghats force the moisture leaden winds coming

off the Arabian sea and receive consequently heavy precipitation of 2000 mm or more a year. The eastern slopes of the Ghats are much drier than the Western faces. The raining is heavier to the south and extends over 8-9 months a year. It is lower & restricted to 4 months of the south west monsoon in the northern parts of the Western Ghats.

Given this rainfall regime the Western slopes of the Ghats have a natural cover of evergreen forest, which changes to moist and then dry deciduous types as one comes to the eastern slopes. The vegetation reaches its highest development towards the southern tip in Kerala with its high statured, rich tropical rain forests. Teak, commercially the most important species, however, grows best in tracts of more moderate rainfall where the natural vegetation is of the moist deciduous type.

The Western Ghats are a treasure house of plant and animal life, next only to the Himalayan tracts in the variety of unique plant and animal species. The Ghats also harbour a number of wild relatives of cultivated plants, including pepper, cardamom, mango, jack-fruit and plantain. This biological wealth has paid rich dividends over the years. In fact the tract has enjoyed popularity for its wild produce of pepper, cardamom, sandal and ivory. This diversity has been on continual decline over the last century and more especially in recent decades, with many biological community types almost totally eliminated. Recent decades have, however, seen serious measures being initiated to conserve some of this fast vanishing biological diversity with the constitution of wild life sanctuaries, national parks and tiger reserves.

The traditional land use on the Ghats has been paddy cultivation in the valleys, supplemented by cultivation of millets and legumes on the hill slope. The hill slope-agriculture used to be largely of the shifting slash-and-burn type, but this has gradually been changed to cultivation of terraces. The traditional horticultural crops were arecanut on the hills and coconut on the coast, along with mango and jackfruit. Cattle and buffalo were maintained in great numbers wherever the natural vegetation was deciduous forest, but these were largely absent in tracts of evergreen vegetation.

A number of horticultural and tuber crops were introduced to this region through the European influence. Prominent amongst these are tea, coffee, rubber, cashew, tapioca and potato. Pepper and cardamom, which are native to the evergreen forests of Western Ghats were also taken up as export crops on extensive scale in modern times Many of the newer plantations were taken up by clearfelling natural evergreen forests in tracts which then had predominantly tribal populations.

The earliest forest plantations recorded were the teakwood plantations raised by the Maratha naval chiefs of Shivaji in 17th Century. Exploitation of timber on a large scale however started only with the British. The evergreen forests were extracted for railway sleepers and deciduous forests progressively replaced by teak plantations. As this demand picked up, forests. which were till then largely managed by village communities were bifurcated into forests on village common lands and State owned reserved forests. The communally held grazing lands and forests cover extensive areas in many parts of the Western Ghats (as do privately held lands to a lesser extent). These lands have been considerably overexploited and degraded in recent decades.

The demands on reserved forests have been mounting of recent years with an explosion of forest-based industries such as paper, plywood, polyfibres and matchwood. There have been other competing demands on reserved forest lands as well, especially for cultivation and river valley projects.

Collection of forest produce such as pepper, cardamom, ivory, honey, wax, myrobolon has gone on for a long time on the Western Ghats. The bamboos and reeds of the Ghat forests have also supported extensive basket weaving. There have been shipyards on the West Coast using the timber of the hills for a long time, as also artisans making wooden toys.

Several industries have been started in recent decades, primarily to utilise the forest resources of the Western Ghats since the first world war. These have included saw mills, brick and tile, paper, polyfibre, matchwood, plywood, tanning. A few other industries have sprung up based on the mineral resources of the hills such as the steel works at Bhadravathi. By and large, these

industries have grown beyond the capacity of the forest resource base to sustain them.

The bulk of the rains of Peninsular India fall on the Western Ghats from which originate the Krishna, the Godavari and the Kaveri – the three major rivers of Southern Peninsula, as well as many shorter west flowing rivers of the West Coast. Traditionally these water resources were used to irrigate the valleys under paddy and arecanut on the hills with construction of small ponds and channels. Beginning from the British times, however many major river valley projects have been executed, either to irrigate the drier tracts to the east or to generate power by taking advantage of the steep slopes to the west.

The Western Ghats are rich in iron, manganese and bauxite ores in parts of the ranges. These are being extracted on a large scale and exported in ore form in recent years, especially from Goa.

Several centres of pilgrimage have traditionally attracted many tourists to the Western Ghats, prominent amongst these being Sabarimalai in Kerala, Madeveshwaramalai in Karnataka and Mahabaleshwara in Maharashtra. A number of other tourist centres have sprung up in modern times. The best known is the Ootacmund (Ooty) in Nilgiris and the Thekkady Wildlife Sanctuary in Kerala.

Transport and communication has been difficult on the Western Ghats because of the hilly terrain, heavy rains and thick forests. In fact, the strength of the Maratha empire founded by Shivaji rested on the strategic advantages of an inaccessible terrain. Transport and communications really began to reach deeper into the Western Ghats only with the British times. A spurt was given to the development of these facilities after independence when major river valley and mining projects brought in extensive transport and communication facilities in their wake.

The Western Ghats have always been sparsely populated as compared to the adjoining plains, because of the difficult terrain and widely prevalent incidence of malaria. The coastal plains under paddy and coconut have supported denser populations while the Deccan plateau to the east had intermediate levels of population density. The settlements on the Ghats have been of small sizes and scattered, the bigger towns all falling on the

eastern side on banks of major rivers or on the West coast at mouths of rivers where they served as Ports.

The Western Ghats people have traditionally depended on the natural vegetations for meeting their requirements of shelter fodder and fuel. They also derived much nutrition from hunted meat. Consequently, their quality of life has rapidly gone down in recent decades due to depletion of natural vegetation and extermination of wild animals. The major gain for the people from the angle of better life has been the eradication of diseases. particularly malaria and the development of better means of transport and communication. Modern health and educational facilities have percolated only a little to the hills except in the State of Kerala where there has been appreciable progress, with substantial fall in the rate of population growth.

The Ghats have large tribal populations only in a few pockets of Dangs and Thane districts north of Bombay and Wynad and Nilgiris tracts. The Nilgiris harbour only the truly stone age hunting gathering tribe of Peninsular India, the Cholanaikas. The tribals have borne the brunt of the degradation of the Ghats, environment and have received scarcely any benifit of development

MAJOR SECTORS

Valley Agriculture and Horticulture

The narrow valleys of the Western Ghats receive silt and nutrients drained off the hiil slopes and are naturally fertile. They have, therefore, been the mainstay of the rulal economy of the tract. The valley cultivation and horticulture have heavily relied on the supply of leaf manure from the slope-forests as well as dung of animals grazing in these forests for its productivity. Recent decades have witnessed : (1) Submersion of large areas under river valley projects, (2) Damage to some areas due to mining uphill of the valley, (3) Severe shortage of organic fertilizers in the form of leaf manure and dung due to deforest-ation and depletion of fodder resources. At the same time, there has been positive improvement in the yields from valley agriculture and horticulture due to the introduction of higher yielding varieties, chemical fertilizers and pesticides; and availability of electric power for pumping water.

There are misgivings as to whether we can sustain these improved yields through intensive agriculture on a long term basis. Such doubts arise because (1) The use of chemical fertilisers alone may in the long run deplete the micro-nutrients in the soil, (2) Pests and diseases develop resistance to available pesticides (3) The exhaustion of genetic variability of indigenous crops may seriously limit our ability to tackle new diseases or pests. These fears are not hypothetical, but are based on what seems to be happening. For instance, (1) the productivity of arecanut orchards of Uttar Kannada with good availability of leaf manure is substantially greater than those of Dakshin Kannada which have little organic manure, (2) the pepper crop in many parts of Karnataka has been totally destroyed by a fungal disease.

Certain developments of recent decades, especially the valley projects and the impact of mining. have had particularly undesired effect on the population. Little thought and effort has gone into rehabilitation of people so affected; in consequence they have been impoverished and have resorted to cultivation of steep slopes, often in catchment areas of reservoirs, aggravating the problem. The decision to take up a particular river valley project has often been made without proper scrutiny of whether the benefits accruing from the project are sufficient to offset the losses due to submersion of highly productive valleys. This has happened in part because of the absence of public scrutiny of the basis on which various projects are taken up.

We are reducing fertile lands which produce what man needs the most; food. We have therefore, to be careful in maintaining the productivity of the valley lands of the Ghats. Such land should be made over to alternative uses only after a proper scrutiny involving wider participation of people. The mining interests should be made to take full responsibility for protecting the fertility of the land on the areas affected by their operation.

The role of organic manure in ensuring long term sustainability of agriculture and horticulture should receive serious scientific attention. At the same time, our development programmes should focus on ways and means to conserve and enhance sources of organic manure in the Western Ghats tracts.

Hill Slope Agriculture

Hill slopes of Western Ghats have traditionally been under shifting cultivation for millets and legumes. The British Government banned this practice in many parts of the Western Ghats, and attempted to put the land so released under forest cover. This was however not implemented uniformally so that shifting cultivation is widely practised to this day in the Maharashtra sector of the Western Ghats, and in some tribal areas elsewhere. A variety of causes, especially, submersion of river valleys have increased the pressure of shifting cultivation in Maharashtra with the result that the fallow period in the cycle has been drastically reduced.

Recent decades have witnessed growing pressure on land for cultivation and extensive tracts of hill slopes being put under the hoe or the plough. Apart from the traditional millets, new tuber crops, especially tapioca and potato are now introduced in the slope agriculture.

Much of the hill slope cultivation is non-sustainable and is responsible for deforestation and excessive soil erosion. The yields too are quite low, and the cultivators derive a very inadequate subsistence from this activity. Cultivation of hill slopes is nevertheless on the increase because of economic compulsions.

Obviously a very careful examination of the use of hill slope lands in relation to their capability is called for. Discontinuation of hill agiculture on land capability classes IV to VIII, which would form most of Ghats hill slopes, should be a matter of highest priority in our development plans. This is a difficult task for a large section of the people of the Ghats have no alternative means of subsistence. We must therefore generate imaginative programmes which would provide guaranteed subsistence for people for putting hill slopes under perennial tree and fodder crops. To achiave this, we will have to provide them subsistence wages for the initial period of tree and fodder production to enable them to wait till these crops mature and bring returns. We must gear the social forestry, rural employment guarantee. integrated rural development and other alied programmes to take up this challenge effectively.

Hill Slopes Horticulture

Arecanut, jackfruit and mango have been the traditional horticultural crops of the Ghats proper while coconut has been extensively cultivated on the coastal plains. Pepper and cardamom were traditionally cultivated to a limited extent, but collected from the forests on a very large scale. The hill horticulture scene has been revolutionised over the past century by large scale introduction of tea, coffee, cardamom, rubber, cashew and more recently, cocoa plantations. Such tree crops are an environmentally more desirable replacement of natural forest compared to cultivation for millets and tapioca. There are, however, questions as to whether we have not gone too far in replacing natural forests by plantations in certain parts of Western Ghats. Occasionally. such plantations have been failures resulting in replacement of good natural forest by a carpet of weedy Eupatorium. The success of these plantations depends on the existence of sufficient extent of natural forest to provide the proper microclimate, to protect the catchments of streams etc. Various compulsions have led to the liquidation of much of such natural forests raising doubts about the sustainability of these plantations. The cardamom plantations in particular, are being cut down to cash the timber, the land is then put under tapioca for a short period till it becomes permanently unproductive. Heavy use of pesticides in these plantations may have negative environmental effects which have not been looked into. In spite of such pesticide usage, new strains of disease have wiped out certain crops for example, pepper in Uttar Kannada district of Karnataka.

The plantations are a modern prosperous economic sector on the Western Ghats. They have however failed to bring sufficient benefits to the large labour force working on plantations. In fact conditions akin to slavery prevailed on many plantations in early British days. While these have ameliorated considerably, not enough has happened to really bring benefits of modernisation to the large force of plantation labour. The tribals forced off the land by plantations have also remained neglected to a large extent.

Careful thought need to be given to the future growth of this important sector on the Ghats. Expansion of plantations should be planned carefully without making excessive toll of the rapidly

shrinking natural forest cover. We should also plan to leave substantial natural forest cover in between plantations for environmental security. Short term exploitation of plantations as with cashing of timber on cardamom plantations should be discouraged. The impact of extensive use of fertilisers and pesticides in these plantations should be monitored carefully. Finally, we must evoive further measure to bring benefits of the plantation industry to the local rural population.

Communal Forest and Grazing Lands

The traditional agriculture and horticulture in the Western Ghats tract has depended heavily on the availability of green leaf manure, dry leaf mulch and burning of dry leaf and branch material as raab for sustaining productivity. The agriculturists also maintain large number of livestock to convert natural vegetation into dung used as manure. Furthermore, there is an exceptional tradition of hot water bath even amongst the poorer classes of the region. All of this means that the population of the Western Ghats depends on the natural vegetation of their region to a markedly greater degree when compared to the rest of the country.

These demands were adequately met in earlier times when the man forest ratio was highly favourable. The rural communities had many traditions of good communal management of rhese resources in pre-British times. Beginning with the British tule and the imposition of heavy commercial demands on the forests, the eco-balance has been disturbed and today the rural demands for natural plant material considerably exceed the supply contributing to a progressive degradation of the vegetation.

The British divided the forest tracts into reserve forests under control of forest department and revenue forests and grazing lands accessible to the rural population. The latter are variously termed as soppinbetta lands, minor forest lands communidades ands, parambhog land, C and D lands etc. A severe reduction in the amount of forest land accessible to the people, a breakdown of traditional village organisation, increasing population pressure and continuing impoverishment of the villages have all contributed to an excessive overexploitation and degradation of communal forest and grazing lands. The situation is in fact worsening every day.

This degradation of communal land is one of the most significant factors in environmental destruction as well as lowering of the quality of life of the people. Instituting good management and rehabilitating the productivity of these lands should therefore receive very high priority in ecodevelopment-oriented programmes for the Western Ghats. The Governmental response so far has however been an effort to taking over these lands as State property and then dedicating them as often as not, to raising commercial crops like Eucalyptus. This approach helps in no way in meeting the rural population's genuine needs. On the contrary, it increases their hostility towards the Governmental machinery.

The approach should be to involve local institutions such as schools, co-operative societies or village panchayats in proper managemnt and rehabilitation of these lands through tree and fodder planting. The local villagers need proper assurance that they will themselves benefit in the long run from such plantat-ions. A whole range of programmes of social forestry, integrated rural development, employement guarantee scheme, rural landless employment programme and the like should be used to finance such projects. Voluntary agencies and educational institutions should be involved in making such programmes successful.

Reserved Forests

States did assert certain rights over the forests in pre-British times, and even raised timber plantations as those for Shivaji's navy. However, the State demands on forests became formidable only with the British rule. The British then constituted large areas of forests as reserved forests and dedicated them primarily to meet the demands of ship building, railways, teak for export to Britain etc. Industrial demands on the forests began to build up after the first World War and rapidly grew on independence, Today, there are very large demands from paper, plywood polyfibre, matchwood industries and saw mills on the forest resources of the Ghats.

While these demands have been growing, there is simult-aneously considerable loss of area under reserved forests for river valley projects, mining, agriculture and horticulture. It is

also true that the industrial demand has been permitted to rise beyond the productive capacity of the forests, often against technical advice. The practice of clearfelling and raising plantations of fast growing species like eucalyptus has not provided the answer as the realised productivity of these plantations has been well below expectation. In fact, some eucalyptus plantations have failed totally in high rainfall tracts of Western Ghats because of the pink disease.

It is abundantly clear now that the reserved forests of the Western Ghats are today being utilized non-sustainably and do not offer further scope for expansion of the forest based industry. In fact, we will have to make hard dicisions to curtail further growth of such industry as well as other demands such as urban demands for fuelwood

The current management of reserved forest bring little employment and no other benefits to the local population. Consequently, the people do not co-operate in the good management of the reserved forests with very deleterious cousequences. There is thus an urgent need to look for ways and means of ensuring that the local people share in the benefits of good management of reserved forests and therefore become willing partners in conserving and nurturing this resource.

Following is a suggestive list of such measures.

(1) A portion of revenue from reserved forests should be earmarked for being made available to the Taluk Development Boards and Village Panchayats.

(2) Special attempts should be made to nurture forest labourers co-operative societies and LAMPS to take over extraction, transport and preliminary processing of forest produce.

(3) New plantations in reserved forests should be raised on the pattem of social security plantations of Gujarat. This progrmme guarantees a family 40 man-days of minimum wages per month for working year round on specific plantations and a 20% share in the net profit from the plantations at the end of 15 years on maturity of the plantation.

(4) The local people should be given special incentives to check illegal seelIng in the forest areas.

The management of reserved forests also requires substantially greater levels of scientific inputs. The universities, colleges and scientific institutions of the Western Ghats region should be actively involved in co-operative research programmes with the forest department to generate these imputs.

Animal Husbandry and Fisheries

Traditionally very few auimals have been maintained in the wetter coastal and hill tracts of Konkan and Malabar. On the other hand, farmers as well as specialist pastoral groups have maintained large herds of buffalo and cattle in the deciduous forest tracts of this region. Small number of poultry are maintained in villages and large flocks of ducks on the Kerala Coasts and sheep were not traditionally maintained in this region.

The progressive deterioration of the communal forest and grazing lands, as? well as depletion of reserved forests has meant that today much of the region suffers from pressures of grazing at levels that cannot be sustained. The problem has been exacerbated by the spread of Lantana and Eupatorium which cannot be grazed upon. A dominant response to this shortage of fodder has been a switchover from maintenance of buffaloes and cattle to herding of goats. Since this browser is highly destructive of vegetation, it cotributes to further degradation of the fodder base.

In fact, fodder has been the most neglected resource of the Western Ghats, as elsewhere in the country. The Dairy Development projects have entirely concentrated on collection, transport and marketing of milk in the urban centres. The Animal Husbandry and Veterinary Services Departments have focussed on veterinary care and making available high quality semen. The agriculture departments have largely neglected fodder cultivation, while the forest department is concerned with halting grazing in forest areas. Few positive steps have been taken to improve the fodder supply.

A rapid depletion of fodder resources, tremendous grazing pressure of hungry animals and the continual iucrease in the goat population have thus characterised the animal husbandry scene on the Western Ghats tract. To get out of this vicious cycle of progressive degradation is then another challenge before

the development planners. This calls for a simultaneous effort at: (a) improving the genetic quality of the livestock through cross breeding, (b) enhancing the fodder base by a systematic cultivation of fodder as a second crop on residual moisture in paddy fields, on village grazing lands and minor forest lands, as well as on reserved forest lands, and (c) organising grazing on rotational basis with the ultimate aim of completely switching over to stall feeding, as well as (d) organising well managed milk markting co-operatives which bring a fair price to the producer.

Fresh water fisheries are very poorly developed on the Western Ghats. The many large reservoirs formed by the river valley project are in fact veritable biological deserts. Serious work needs to be done to develop the techniques for stocking these large reservoirs, as well as the smaller ponds and streams with fish.

Biological Diversity

The Western Ghats are second only to the Himalayas in the diversity of its plant and animal life with a large number of species being confined to the region. The tract also has many wild relatives of cultivated plants and number of indigenous cultivated crops and domesticated animals. This biological wealth has been rapidly declining in recent decades with a diminution in the area occupied by natural biological communities and their fragmentation in ever tinier fragments.

It is necessary that we prepare a very careful plan for the conservation of this biological diversity by identifying the remaining good examples of each of the biological community types of the region. We should then ensure that a few representative samples of each of these community types is given long term protection. While organising this network of nature reserves, it should be borne in mind that the long term prospects of species survival increase rapidly with an increase in the area of the total habitat and with the richness of the habitat mosaic. We should, therefore, constitute a few large bio-sphere reserves with substantial areas of variety of natural biological community types.

The religious traditions of nature conservation have played

an important role in saving much of our biological heritage. Western Ghats, for instance, have many sacred groves which are amongst the best preserved of their vegetation types. These traditions of nature conservation should be actively encouraged and incorporated in our plans for saving the biological heritage of the Western Ghats.

While protecting natural habitats and wild-life, we have to develop ways and means of reducing their conflict with human population. Crop raiding by elephants and wild pigs, killing of cattle by panthers are serious problems leading to huge economic losses to poor farmers in many parts of the Western Ghats. Trenches, electric fences or other measures to keep these animals away must be experimented with and promoted on ground through programmes like the rural employment shcemes. We should also provide a certain minimal level of compensation wherever it is justified.

The preservation of indigenous cultivated crops and domesticated animals is of great significance for the continued success of our plant and animal breeding programmes. These races need to be maintained not only in collections at Agricultural Research Stations, but also in situ in a few pockets following traditional varieties and practices of cultivation. Such pockets should be carefully identified and the preservation of traditional varieties in the pockets promoted through special financial inputs.

Water Resources

Western Ghats are a region of heavy rainfall and most of the major rivers of the Southern Peninsular have their origin in these hills. These rivers begin as small streams in the hills and their waters have been traditionally used in irrigation of paddy fields and arecanut archards by construction of small bunds and channels. Unlike the Himalayan tracts water has been used to run water mills for grinding grains since centuries, hydel power was not tapped in the Western Ghats tracts in earlier times A whole series of important ports of the West Coast lay at the mouths of the short west flowing rivers of the Western Ghats.

The catchments of all these river systems were thickly forested in pre-British times and many of the early British gazetteers give accounta of the destruction of these forests between 1800

-1850 and the consequent siltation of many ports on the West Coast, especially in the Ratnagiri district of Maharashtra.

With steep slopes to the West and parched, dry land on the Deccan Plateau to the east, damming the rivers of the Western Ghats for power production as well as irrigation in an attractive proposition. A large number of such river valley projects have consequently been completed over the last century. Unfortunately almost every one of them has suffered from a neglect of conservation of soil and vegetation in the catchment area, and lack of due care in rehabilitation of farmers who have been seriously impoverished on the submersion of fertile river valleys under reservoirs. In fact, the two are linked, for everywhere the victims of submersion have been forced to move uphill and put the hills or the catchment region under cultivation to eke out a subsistence Since these hill slopes cannot really sustain them, the farmers have increasingly encroached on forest lands. This has led to heavy soil erosion and high levels of siltation of the reservoirs.

This reduction in the life of reservoirs and a failure to properly develop the irrigation delivery system in the command area has meant that the actual benefites realised from these projects have been far below the expectation, while the costs have been much greater than anticipated. There have however been very few careful exercises of an evaluation of the economic. environmental and social costs and benefits of these projects and we have gone on the assumption that the benefit/cost ratios have on the whole been quite favourable. This is a doubtful assumption that now needs to be carefully looked into before further major river valley projects are taken up.

There is an urgent need today to put back the catchments of all our major river valley projects, as well as of the other water courses of the Western Ghats under cover of perennial tree and foddder crops. We need to plan for this in an integrated fashion and ensure that private lands, village common lands and reserve forest lands constitute part of such a plan. Moreover, such a plan should attempt to generate guaranteed employment for the victims of submersion of river valley projects as a matter of the highest priority.

The coming decades should also focus on much more

efficient utilisation of power and irrigation produced so far. There is much scope for energy conservation by such simple devices as improving the efficiency of agricultural pumpsets. We must also direct serious attempts at discouraging the currently wasteful practices of flood irrigation and learn to use the irrigation waters much more efficiently.

In many regions, the tapping of ground water by wells has reached excessive levels with consequent drop in the level of the water table. Attention should be given to measures to discourage overuse of ground water and to improving the recharge of the water table.

On the hydel energy front, tapping of the micro-and mini-hydel potential and its utilisation for encouraging dispersed rural industries also deserves high priority.

Village Industries and Handicrafts

With its rich forest resources, the Western Ghats tract has traditionally supported a large community of bamboo and reed basket weavers and some specialised communities of wooden toy makers and sandalwood and ivory carvers. More recently

Matchstick and agarbatti manufacture and bee keeping have also developed as rural industries. All of these have been experencing problems of mounting shortages of raw materials and every attempt needs to be made to secure the raw material base of these crafts. A continued supply of ivory is out of question and the supplies of rosewood and sandalwood are also dwindling. These specialised artisans will perforce have to shift to other raw materials such as horn or plastics or other woods and this should be systematically encouraged. It is however, quite possible to ensure better supplies of bamboos and reeds and we should take up special programmes to involve the craftsmen in social forestry projects to augment these resources. There is also good scope for encouraging planting of nectar yielding species in the various programmes of tree crop production.

Organised Industry :

With its poorly developed infrastructure of transport and communication. the Western Ghats tract is naturally at a

disadvantage with respect to industrialsation. The industries that have developed in the region are therefore those that are at some special advantage. The ready availability of fuelwood and of appropriate soil has been responsible for the growth of a large number of brick and tile industries on the West Coast. A number of paper, plywood and ploy fibre industries have also sprung up on the Western Ghats for the same reason. Other industries such as Photofilms at Ooty have been attracted by the cool climate of the hills.

Unfortunately, little thought has gone into securing the long term resource base for these industries. The industrial capacity has been permitted to grow well beyond the capacity of the resource base, often against sound technical advice. Consequently, there has been a serious depletion of the forest stock. Softwood trees of larger girth, and bamboos have all but vanished from many forest ranges, and the barren lateritic plateaus of the West Coast bear witness to the heavy fuelwood demands of the brick and tile industries This resource depletion has adversely affected the local people; some segments such as basket weaving communities have been especially hard hit.

The industries have also caused serious despoilation of land and water. The removal of soil for brick and tile factories has affected the fertility of farmlands and the dumping of effluents in the rivers by paper and polyfibre factories as well their air pollution has been a source of much distress to the local population Action to alleviate pollution has been very tardily initiated in the last few years alone.

The real intention of bringing industries to backward areas of Western Ghats is to bring benefits of enhanced economic opportunities and whole culture of modernisation to the locality. This has hardly happened. The industries have taken little interest in training and recruiting local people. The forest extraction labour has been particularly left just where it was poor, illiterate and exploited. The purpose of making people genuine partners in modern development has thus been hardly served by the industrial development of the Ghats. Instead the industries have merely exhausted the

local resources and polluted the environment.

Future development programmes must obviously attempt to reverse these trends and to repair the damage already done. Further expansion of industry must take place only after the sustainability of the resource base is fully assured. This means that new plantations will have to come up and industrial capacity should grow only when these plantations begin to yield and lead to a genuine enhancement of the resource base. The industry should also be made fully resposible for cleaning up the pollution it causes. One simple measure is that it should be allowed to draw water only downstream of where it dumps its effluents.

The organisation of the industry also requires a radical change to assure the local population a share in the profits of the industry. Mechanisms should be developed to give to harvest labour and farmers involved in raising tree crops shares in the company. Ideally all further expansion of industry on the Ghats should be in the small scale co-operative sector.

Mining :

The Western Ghats bear bauxite, iron and manganese in substantial quantities and there has been a great deal of open cast mining for these ores. When the ore is extracted it leaves behind substantial quantities of tailings, which may get in waterways and lead to serious problems of siltation or cover farmland downhill and destroy their fertility. For instance, the Kudremukh Iron Ore Project has led to problems of siltation of Bhadra river and its reservoirs; while many fertile fields have been destroyed by mine tailings in Goa. Development of mining in future must therefore, pay attention to proper containment of tailings.

There has been little attempt at revegetation of the land once an area has been mined over and abandoned. This calls for serious scientific research and experimentation.

Transport of the ore by road or ships is yet another possible source of environmental problems.

Tourism

The Western Ghats offer scenic resource as well as pla-

ces of religious and historical interests. The resultant tourism has in some cases promoted the preservation of the environment, as with Matheran in Maharashtra, but has led to excessive demands on resources and deterioration of the environment in other cases, as with felling and large scale collection of fuelwood to cater the tourists that used to take place in the Bandipur Tiger Reserve. The tourism industry has brought some employment and economic gains to the local people, although it is largely controlled by outsiders. The lodging and transportation of tourists needs to be carefully planned to avoid adverse environmental consequences.

Transport and Communication

The Western Ghats have a poorly developed system of transport and communication by the very nature of its terrain. In fact, there are many villages which remain entirely cut off from all communication almost throughout the monsoon due to a lack of footbridges over streams. A lack of communication facilities obviously hampers delivery of health and educational services and opportunities for marketing and therefore, needs to be remedied.

The communication facilties are unfortunately a two–edged weapon. In the present set up where the forest resources are subject to rapid, non–sustainable utilisation, improving access to a region by trucks immediately leads to a depletion of tree cover in the region. We must, therefore, be very careful in improving communication facilities by road. Construction. of good footbridges to ensure that villages are not totally cut off during mansoon should be high on our priority. On the contrary, taking good motorable roads in the few remaining pockets of good natural forest should be avoided to the exent possible,

Human Settlements

Shelter : A large proportion of the people of the Ghats live in houses built out of mud and plant material with a smaller proportion using lateritic stone and tiles. The ready availability of bamboos and timber had been a boon in early times, this holds no longer. A particularly serious problem is that of thatch for the roofs of the houses. Because of

the high rainfall, this thatch has to be changed every year and is now becoming very difficult of procure in fact thatch today takes away from the cattle grass or paddy straw which would other wise have been fed to them. We could make a definite contribution to the quality of life of the weaker segmets of the population of this tract if we could make bamboo readily available to them for construcuion and develop simple treatments to improve the life of thatch. Bamboo should therefore be an important component of social forestry programmes.

Domestic Energy : Energy for cooking, heating bath water and processing agricultural produce such as parboiling of rice is very important for the Ghats where per capita fuel consumption is amongst the highest in the county. Till half a century ago these needs were readiily met by the tree growth near the villages. This is no longer so. Those villagers who own substantial orchards of coconut or arecanut are still reasonably well off and can meet their fuel needs from the leaf stalks of these palms. Others, however, are in serious difficulties and may have to walk several kilometres a day, or even go across streams and estuaries in boats to meet their daily fuel needs. Their pressure is leading to degradation of many village forests and after these are exhausted reserve forest areas and things have come to such a pass that people are excavating roots in some villages.

A two pronged approach is called for improving the efficiency of fuel use in domestic chulas (hearth) and enhancing the availability of fuel. Some excellent designs are available for the first purpose; for instance the Astravale of Indian Institute of Science. The development plans of the coming years should go all out to propagate these. Secondly fuelwood plantations for the villagers managed and raised by the villagers themselves must become a major component of the social forestry programmes.

Drinking Water : Scarcity of drinking water at the height of summer is regularly faced by many villages in this high rainfall tract. Programmes of watershed conservation seem to be the only long term answer to this problem. The presesnt

situation also demands ready solution.

Sanitation : Modem sanitation is virtually unknown in the villages of Westem Ghats, Cheap and efficient designs such as Sulabh Shouchalaya appear to be the answer. Social awareness need be aroused.

Social Services

Nutrition : As with the rest of the country, a substantial proportion of the population of the Ghats is too poor to afford adequate nutirtion. Nevertheless,people of this tract have been fortunate till recent times in the availability of relatively cheap fish, hunted meat such as wild pig and abundance of food such as jack fruit in certain seasons. The first two have largely disappeared, and the third too is on decline as trees like mango and jackruit fall to the axe.

The real solution to this problem of inadequate nutrition is of course to generate employment for the rural population on a massive scale. The kinds of investments needed in industry to achieve this are beyond our means. We must therefore fall back on land. In this case, the answer must come from rural employment generating programmes for soil conservation and tree and fodder production.

Health : Many parts of the Ghats were earlier afflacted by malaria and used to suffer from a variety of gastro-intestinal disorders in the monsoon. A major achievement since independence has been a near total elimination of malaria. This has permitted colonisation and population growth in tracts like Uttar Kannada and Wynad. This eradication of malaria was however based on control of mosquitoes by DDT. As mosquitoes have developed resistance to insecticides, there is a danger of malaria making a comeback. This time, the control can only come through environmental sanitation and control of breeding of mosquitoes. We should begin to focus serious attention on this problem in the coming years—

While malaria is under check deadly viral disease, KFD, is spreading with an increase in the tick population conse-

quent on the opening of the forest canopy. Controlling the tick vectors of KFD is going to be a formidable challenge in years to come and we should devote immediate attention to this problem. More generally, the health care systems in Westem Ghats are quite inadequate.

Education : Inspite of the difficulties of communication, the Kerala and Dakshina Kannada areas of Western Ghats have made remarkable strides in education. As education and especially female educational levels appear to be closely related to fall in fertility, we should make much more efforts to spread education in this tract.

Family Planning : Population control is going to be an important element in our ultimate performance in giving a better life to the people. But family planning is not just a matter of availability of family planning devices or performance of vasecto mies. The motivation for a small family seems related to a complex of factors promoted by higher female literacy, lower infant mortality and security of making a living. This analysis suggests that we must give very high priority to health, education and generation of employment in rural sector if all our developmental gains are not to be ultimately annulled by an explosion of the population.

Broad Priorities

Planning for development in independent India has focused on public investment in major power and irrigation projects. in steel mills and fertilizer plants, and in creating favourable conditions for industrial growth and intensive agriculture. This approach has yielded rich dividends in building a sound industrial base and in stepping up our food production several folds.

These gains, however, appear transitory as the hydel and irrigation prolects silt up, floods wreck havocs in plains and paper and plywood mills run out of raw materials while filling long stretches of rivers with effluents. At the same time our masses, deprived of benefits of development, are still illiterate and insecure that continue to raise large families.

We must therefore look for alternative paths to development which would be sustainable and whose benefits will percoiate to the population at large. The industrial route calls for enormous investments to support a small number of people. Its demands overwhelm us and leave us little leeway to look after the quality of life of people by giving them adequathe ducation and health care. On the other hand, production from the land continues to support the bulk of our population giving them a subsistence at whatever level it my be. And we will have to continue to depend on land for supporting the bulk of our people. But our land is badly abused, with as much as one third of it lying essentially unproductive. This abuse of land also affects the other vital resource, water.

This suggests that the alternative development path rhat we are looking for should have its thrust on ensuring good management of our land and waters. In more technicai terms, this programme wili have as its primary objective, proper matching of land capability with land use and attempting to maximise the productivity under that particular kind of appropriate use. Such an effort will not necessarily require large capital inputs, but calls for extensive labour inputs managed under proper social organisations. In other words, the essence of this programme is to create large scale employment in production of soil and water conservation and tree and fodder crop porduction. Furthermore, the labour employed should not be alienated from the land as transient wage labour, instead the man or woman working on a piece of land should have a stake in the long term maintenance of its fertility and productivity.

While thus providing opportunities to people for productive employment, we should also invest in their, health. education and security which would eventually motivate them to plan their families and contain the populotion explosion.

We believe that these should be our broad priorities. They would be difficult to translate into practice because while such a programme will benefit our masses, these are

poor, illiterate, fragmented by caste barriers and with no real political clout. On the other hand, the large projects which are our present priority benefit small groups of well organised, powerful interests. Unfortunately these interests often end up forcing us into projects like the Kudremukh Iron Ore project which is at once an environmental and an economic disaster.

INSTITUTIONAL ARRANGEMENTS

The Social Mileu

It has been said that the interaction between man and nature is largely moulded by the inter-reletionship of man and man within the human society. It is therefore essential to consider the development prospects of the Western Ghaths in the context of organisation of the society that inhabits it and affects it. Above all, it is a fragmented caste society in which the social responsibility was traditionally confined to a person's own caste group. It is a hierarchial society which is basically inegalitarian. It takes for granted that certain caste groups will be educated, will own land and have power, while other caste groups will remain poor, illiterate and powerless. The notion that these low caste groups have an equal right to benefits of development has simply not been assimilated. That is why, in perfectly good conscience, we argue in the same breath that a monthly wage of Rs. 250/- for a social security plantation worker is quite adequate, while complaining that a solary of Rs. 3,300 per month is totally inadequate for a scientist or a bureaucrat.

Our society is split into a small elite of those working with the modern industrial sector. government and semi-government organisations and those owning irrigated land under cash crops. Typically, this sector is recruited from the upper castes and it has developed a certain solidarity and commonality of interest. The remaining society of small land holders, landless labour, village artisans and pastoral, nomadic and tribal groups numerically makes up the bulk of the society, but by and large remains poor, illiterate powerless and throughly divided amongst themselves by communal

and caste barriers.

There is in the society much awareness of the need to bridge this divide and to take benefits of the economic development to these weaker sections. It was a focus of Mahatma Gandhi's concern, and has been a primary objective of all our five year plans, and the twenty point programme. Nevertheless, in point of fact, we are not drawing closer, but going further and further away from this objctive with each year of independence.

This is because when the development plans are actually implemented the modern industrial sector, the bureaucracy and the professionals and the rich farmers ensure that all the benefits accrue to them. To overcome this, we have devised very specific plans such as Antyodaya and National Rural Landless Employment Pragrammes. But these toohave failed to fulfill their objectives because the administrative machinery has no real interest in ensuring the success of these programmes, while beneficiaries too are in no position to bring this about.

Hence, not only have the benefits of development failed to trickle to the masses, but they have been made to bear the brunt of cost of development. The clearest instance of this is the submersion of fertile paddy fields under river valley projects all over the Western Ghats. The farmers who have lost in this fashion have been invariably inadequately compensated and have ended up much impoverished. This improverishment has in turn triggered a whole cycle of degradation of catchments of the reservoirs. The loss of forest product and wild meat from these tracts has again most directly affected the local displaced farmers. Thus, we have been implementing a system of passing on the benefits of development to those already well off and costs of development to those weak and poor.

The environmental costs of development have indeed been very substantial. We have been ignoring these because they have largely been passed on to the weaker sections of the society. The whole challenge of ecodevelopment is to change this set up. It aims to ensure that we

do not permit excessive environmental costs to be incurred, and to pass on the benefit of development to the weaker sections.

Political Institutions :

We have adopted a democratic form of Government to ensure that the aspirations of the masses are expressed through their elected representatives. We have attempted this at several levels from the village panchayats, through taluk boards zilla parishads and State legislatures, to the parliament. This system seems to have failed on two counts Firstly, the whole process of elections has promoted factionalism and disunity with the result that caste and communal barriers and loyalities have become hardened instead of dissolving in independent India. Secondly, the mechanics of getting elected have ensured that the elected representatives belong to and are beholden to the powerful, vested interests of the region, rather than reflect the interests of the majority of the population.

Given this situation, the political leaders have failed to play the positive role expected of them in the development process. This has been the case for the Western Ghats tract as elsewhere.

Co-operatives

In independent India. we have nnrtured the co-operative movement in the economic sphere with the hope that they will bring real benefits of economic development to the people, eliminating the middlemen and traders who would otherwise usurp all the profits. The co-operatives have with out doubt fared better in their expected task than the political institutions, although there have been large scale disappointments in this sector as well.

On the positive side, the co-operatiues have been responsible for the only two experiments in which benefits of modern industrial sector have reached the farmers, namely in the sugar co-operatives of Western Maharashtra and milk co-operatives of Anand. The tribal forest labourers co-operative societies of Dangs in Gujarat are another story of

successful involvement of the forest dwellers in sharing the benfits from working of the forests. On the negative side. however, the co-operatives have largely been dominated by a small sector of the rural population which has successfully cornered the money and power deriving from the functioning of the co-operatives. Worse still, many co-operatives have been mismanaged and their funds misappropriated. Nevertheless. in the balance, the co-operatives are an important instructment which will have to be applied for the process of eco-development in the decades to come.

Bureaucracy

The British fashioned an official machinery in India to suit their purpose of collection of revenue and maintenance of law and order. The bureaucrats were largely recruited from the urban upper castes who had no real sympathy for the needs of the rural masses for they were hot servants of the people, but agents of the rulers. The business of the Government was official secrets; people had no right to pry into these. The decisions were taken in the Westminister and handed down to the Indian bureaucracy for execution. There was financial audit because the British were concerned with financial performance of collecting revenue and keeping the costs of Government in check; but there was no other performance audit since all other performances were irrelevant.

The role and duties of the bureaucracy radically changed in independent India. They were now expected to serve rather than rule over the people. Futher, we took the decision that Government will have the responsibility to direct' oversee and execute much of our economic development. To this end, we have created a very large bureaucracy to administer the process of economic development of the country.

This bureaucracy has continued to be largely recruited from urban middle classes, with no reason for sympathy for the weaker sections of the rural society. Instead, they are natural allies of the modern industrial sector and the white collar professional classes. The large organised bureaucracy

is itself by now a major political force. They have, therefore, tended to administer and direct the process of development in directions which serve the industrial and urban professional clases with due concessions to the rich farmers lobby which has considerable political clout.

If this official mochinery is to orient itself to go in the alternative directions that we have discussed above, there will have to be many changes. We already accept in theory many of the objectives set above, although we keep going away from them. One of the reasons why this can continuoulsy happen is that there is no open, free scrutiny of the performance of development agencies and the only audit they are subjected to is financial audit. We must immediately ensure that the details of the various development schemes, industrial and river valley projects, forest, working plans and so on are fully open to the public and that there is tradition of free discussion of the achievements of all such programmes. Beyond that systems will have to be developed of real peformance audit and assignment of responsibility to the officials.

Educational and Scientific Institutions

Learning in India has long been monopolised by upper castes who had no sympathy for manual labour and the lower castes of rural India who engaged themselves in it. It was these castes who quickly took to the modern education introduced by the British who only wanted to train Indians to perform clerical jobs. The result has been a tradition of bookish learning divorced from the real life being lived in rural India. The products of this system only want urban white collar jobs, and the scientists trained in this tradition only want to work in spohisticated laboratories.

In consequence, our educational and scientific institutions have made little positive contribution to the ecodevelopment concerns mentioned above. While colleges and universities have proliferated in urban centres churning out lakhs of so-called educated youth who swell the ranks of urban unemployed, the primary and middle schools remain utterly neglected throughout most of our rural areas. The academic

research conducted at our universities and scientific institutions remain mediocre and finds little application in real life.

This obviously has to change and we must attempt to orient the educational and scientific institutions of the Westetn Ghats region to make positive contributions to the process of ecodevelopment. This would certainly require many radical changes in the way these institutions function.

Voluntary Agencies

The organised institutious have thus been rather inadequate to cope with the challenges of independent India. What then of voluntary, non-Governmental agencies ? Most significant amongst these has been the Gandhian Sarvodaya Movement. Its most important initiative, Bhudan, has been a dismal failure. But from it has come the inspiration for many of the ideas of ecodevelopment set out above through the efforts of Dasholi Grama Swarajya Sangh led by Shri Chandi Prasad Bhatt.

A rather different, but very vital current has emerged from the popular science and movements as exemplified by the Kerala Sastro Sahitya Parishat. They have catalysed the process of a fresh look at our development process and brought about some genuine involvement of scientists and intellectuals in the problems of the country.

There is also a network of youth and women's clubs in the rural areas and Rotary and Lion's Clubs in the towns of the western Ghats traot. All of these will have to be organised to play an effective role in the process of ecodevelopment.

Need for Integrated Development

The ancient Indian caste system assigned a particular duty or dharma to each caste. Each caste was supposed to follow this duty and this duty alone, and not to transgress on the duties of other castes. This compartmentalisation, this segmented view and this jealousy against transgression by others continues to characterise our national life. An irrigation engineer thinks only of the construction of a dam and not of what happens to the vegetation of the catchment

area, or the resettlement of refugees of submersion. Nor is he tolerant of anybody else enquiring into the technical details or justification for a particular dam. This segmented view and intolerance of wider scrutiny has led to our development efforts often working at cross purposes and annulling each other.

Such an approach is particularly detrimental from rhe environmental point of view for until recently there was no agency responsible for environmental concerns, and each sector continued its own way inflicting unaccounted environmental costs on the society at large. This narrow approach has also led to a total neglect of the health of publicly owned lands and water bodies and the vital resources of fodder and fuel produced on such land.

There have, of course, been attempts to overcome this problem and take an integrated view of the development process. Districts have District Development Councils or District Rural Development Societies where the various agencies are brought together. Certain border districts have more unitary, single line administrations. The task force of planning Commission on ecodevelopment in the Himalayas has in fact strongly recommended that the system of single line administration should be implemented.

The two issues involved are firstly of the nessity to take an overall systems view when planning development, and secondly of the necessity to implement the programme effectively without excessive proliferation of procedure and agencies. Both are very relevant to proper execution of ecodevelopment progrommes.

Watersheds as Natural Units

While environmental impacts are pervasive, even on a global scale, one has to define small units within which integrated planning and administration are possible. Individual villages or individual watersheds have been alternately proposed as proper units. The planning Commission Task Force relating to ecodevelopment have particularly emphasised the need of taking watersheds as a unit and evolving a single line administration to look afier the integrated development of each watershed.

Involving People

While much has been said of the need for planning from below, grassroots inputs and so on, little concrete has happened. That it should happen is evidently a crying need of the hour. A first prerequisite for this to happen is that all programmes of the Government relevant to the development of a region should be open to public scrutiny and discussion. Furthermore, this information should be readily available at the taluk level itself and not in the State capital. The barrier of official secrets in matters of vital public concern should be removed once for all.

Once this is accomplished, we must actively encourage debate on formulation, and co-operation in implementation of development programmes by village panchayats and taluk boards, local schools and colleges, and voluntary agencies such as youth clubs, co-operatives and so on.

There are several parts of the Western Ghat tract where conditions are favourable for the initiation of such experiments for more genuine involvement of people. This should be an important element in the ecodevelopment plans for the coming years.

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(□ Adopted from **Prof. Madhav Gadgil's** *'Disenssion paper for the workshop on Ecodevelopment of Western Ghats,* Trivandrum. May 11/13/1984.)

Ecology of the Western Ghats of Kerala : an overview

Kerala State situated between 8° 17' and 12° 47', North latitudes and 74° 51' and 77° 24' E longitudes is a narrow strip bounded by the Western Ghats on the east and Arabian Sea on the west with a geographical area of about 38000 Km^2. The Western Ghat region of Kerala, covering nearly 21856 Km^2 or 56% of the total geographical area of the state, is the provenance of all river systems that sustain the agroeconomy of the state. The whole life supporting system of the state is intricately balanced by this hilly region. The region enjoys heavy precipitation (3000mm), maritime climate which promote luxuriant plant growth. This has lead to the development of a specialised land use pattern.

Based on the altitude three broad natural regions can be recognised in the state : low land (10.2%of the area). midland (41.8%) and high land (48.0%). Thus, it is quite evident that the ecological stability of the highland will dictate the economy of the region.

A wide range of agricultural and plantation crops are cultivated while perennial crops (tea, coffee, cardamom, rubber, pepper, coconut etc) cover over 35% of the area. Due to heavy population pressure (654 people/Km^2) the per capita land availability is only 0.14 ha. The agricultural sector is dominiated by cash crops and consequently the state is an importer of almost all food items.

The land use pattern has been undergoing continous changes and with quick urbanisation. The area used for

non–agricultural purposes has increased markedly. In agriculture there has been a shift from annual and seasonal crops to perennial. Paddy areas are being converted into coconut, rubber and real estates.

It should be noted with concern that the potential basic resource of the Western Ghats is the forest cover. These forests play a vital role in regulating the flow of the 44 river systems which feed the state and thus control the very existence of its people and economy. Todate, the so called 'growth' has been achieved by damaging the equilibrium of the environmental resource base of the region.

In Kerala between 1940 and 1970, 3450 Km^2 of forests have been diverted for agriculture, irrigation projects and settlement programmes. Even today different official agencies give varying figures with respect to the area under forests, (from 24.2 to 29%) while the actual area is less than 10%.

All forests in the area are under public ownership. About 1900 Km^2 which was under private custody has been taken over by the state in 1971. The chief forest types occurring in the state are : evergreen and semievergreen, montane subtropical, moist deciduous, dry deciduous and man–made forests.

Forest denudation is the major problem as the vegetational cover of Kerala is being destroyed at a quick pace. Depletion of the forest which has become alarming in the recent years had started in the last century when the Britishers had introduced plantation crops like tea, rubber and coffee in the hilly region. It continued unabated all through the years. The multipurpose river valley projects, forest plantations, rehabilitation programmes, construction works etc. have caused further depletion. Moreover, with the absence of clearcut boundary demarcation between forest and non forest land particularly in the dense vegetation area like Kerala and the complex socio—political situation have further perpetuated the deforestation through encroachments. Between 1970 and 1980 1048 Km^2 of forest land has been diverted for non forestry purposes.

It is interesting to note that foresrty operations in the

State provide maximum non-taxable revenue (over 60%) when compared to other sources. Justifiably, forests are treated only as a source of revenue and other benefits accruing from them, namely, watershed protection, minor forest products, climatic amelioration, soil binding etc. are neglected.

A sizeable amount (1500Km^2) of forests has been converted to plantations. Plantation forestry has a fairly long history in the state with teak plantations raised in Nilambur in 1840. Upto 1960 teak continued to be the principal plantation species (770 Km^2). Eucalyptus (400 Km^2) came to the forefront when demand for pulpwood increased. This ambitious plantation forestry programme has failed due to indiscriminate extension of plantations into unsuitable areas, wrong choice of species and deplorable management practices. Plantations of miscellaneous species (Bombax, Ailanthus, Balsa, Rubber etc.) account for only 400 Km^2

Plantation forestry is aimed at meeting the demand of the forest based industries. In Kerala there are 1024 registered saw mills employing 6980 people, 81 plywood units with a capacity of 18.6 million m^2 (4 mm thickness) exists, producing 18% of the total plywood in the county. Unplanned growth of installed capacity is the main reason for demand - supply mbalances. 144 match units in Kerala employ nearly 2000 workers. pulp and paper units consume over 3,35,000. tones of bamboo and reed raw material annually.

Traditional forest based sector like mat weaving and basket weaving employ over 3 lakh workers. But when meeting the industrial demand becomes the principal objetive of public sector forest management, obviously there wil be a reduction in the share available to other sectors and consumers. Thus, the demand of local population on essential items from forests is never met.

It is necessary to stress that the present management practices followed by the forest department lead to destruction of the resource base. For example, the selective felling operations in evergreen forests to supply plywood raw

material tantamounts to clear felling. Large scale clearing of reed and bamboo areas ruin these precious resources. Forest protection is also a weak link in the management. Fire is an annual phenomenon in forest areas and no effective measures are taken to control it.

In general, planners and policy makers have viewed Western Ghats as potential resource base for economic development with little attention to the capability, suitability, ecological balances and the socio—economic problems of the people. major environmental problems faced in this region relate to deforestation and subsequent land degradation. Unsuitable tillage practices on steep slopes and loss in vegetational cover leads to removal of bulk of the precious top soil. In tropical warm humid climate the soil fertility is restricted only to the top few centimeters. Exposure of the soil to extremes of wetting and drying leads to the compaction and formation of laterites, rendering it unsuitable for agriculture. Landslides have become common due to disturbance iu the natural slope by deforestation, road construction, etc.

The Kerala part of the Western Ghat region hosts a number of hydroelectric and irrigation projects. The experience derived from the existing projects shows that these projects not only cause sub-mergence of considerable areas of forests but also change the hydroecological regime and displace the local inhabitants. The lower reaches of the rivers on which projects are installed lose much of their run—off therehy adversly affecting the ground water regimes. In addition, the watersheds are deforested causing premature siltation of reservoirs. The rivers play a major role in restricting the intrusion of saline water, from the sea at their mounths.

Changes in the land use have disrupted the inherent hydrological cycle. Due to accelerated surface flow with the absence of protective vegetation, infiltration is hampered thereby reducing the recharge of aquifers.

In the areas adjoining natural forests fairly large human communities exist which depend upon the forest produce

for survival. Thls includes the tribals and other economically backward sections of the society whose economic well-being cannot be assured by plantations without produce diversity. Forest productivity has a wider meaning than merely the yield of timber. Productivity of forests currently perhaps unaccounted for in economical terminology includes critical and essential benefits such as climatic amelioration, water retentivity of soil, soil binding, intrinsic genetic diversity, etc. Which from a different point of view may even be more valuable than timber producation.

In addition, the tropical evergreen forests are the store house of a wide range of plant and animal species. Although 2248 Km^2 of forest land in Kerala comes under Sanctuaries and National Parks, the managment is deplorable.

The irony of the whale affair is that it is the state, through its functionaries and policies, which is commiting the brutal act of ecological destruction and ruining the very fabric that protects Kerala.

Drastic and radical steps have to be taken to reconstruct the ecology and life support systems. Operations of market forces and mechanism like social forestry programmes cannot fulfill the people's needs and maintain the ecological balance of the area. Theories that we will be able to substitute one ample resource for another is sheer nonsense when simultaneous pressures are being felt across the whole range of resources. We are at the threshold of reaching institutionalised limits by the growing incompetence and declining performance of the planners and executioners. The old system is bankrupt and only the wisdom of ecology can show us to create a new pattern of life. It is high time we think of developing a management system for greatest sustainable benefit to the present generation which maintaining its potential to meet the needs and aspirations of the future.

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The Western Ghats A New Battleground

With the slogan, Paschimi Ghat vuisi (save the Western Ghats), environment groups in Karnataka have sought to channelise their concern for the disappearing forests in the area into a full-fledged movements. Indeed, preserving the sanctity of the Western Ghats has been a recurrent theme with them whether it is the recent demand to ban felling in the evergreen forests in the poacely state of Kodagu; or the sustained criticism of the Government's eucalyptus craze in the high rainfall belt of Malnad, or the bitter opposition to the sanctioning of a nuclear power plant in the heart of the virgin forests of Uttar Kannara, or the outcry about the Bedti dam in Uttar Kannara after the Apikko chaluvaligars entered the forests of Salkani on September 8, last year, and symbolically hugged the trees marked for felling.

From jungle satyagrahas and the invocation of forest gods, the environment movement in Karnataka has today matured into a formidable watchdog of the state's environment. For the first time environment activitists have spelt out their common objective : At a recent seminar, 15 environment groups from all over the state decided to form a federation to fight against the degradation of the Western Ghats. With over two lakh hectars of the forests in the ghat section under hydroelectric projects, timber industries and population encroachment, the federation faces an uphill task.

This year, the scanty monsoon showers failed to erase the tell–tale marks of the debilitating drought that gripped as many as 17 of the 19 districts in the state. The high

rainfall zones of the Western Ghats and the Malnad belt received rains hardly worth the mention. As a result, the dams are only half full and the lands still stretch out, parched.

Environmentalists feel that the large-scale felling of trees in the Western Ghats and the resulting denudation is responsible for the Land of the Blue Hills being slowly transformed in to a severe drought-prone zone. It is this conviction that has finally resulted in environmentalists, conservationists and scientists jointly committing themselves to the battle to save the Western Ghats.

Nearly 800 square km of some of the best rainforest tracts in the world are to be found in the forests of Kadagu which stretch for 140 km, from the Pushpagiri hill in the northeast to Brahmagiri in the extreme south.

Opposition to indiscriminate felling of trees in the upper reaches of the ghats has recently shifted from Uttar Kannara, where the Appiko movement began, to this rainforest belt, while the people of Coorg, Karnataka's rich coffee district, have accused the Forest Department of conniving with the timber industries in recklessly felling trees in the coupes leased to them, opposition legislatores have held the Forest Ministers responsible for reducing the beautiful evergreen forests of Kadagu into " football fields ".

In response, the ruling party has dismissed the allegations as politically motivated and the Forest Department has emphatically stated that in the coupes allotted to timber industries, the Working Plan has been strictly adhered to.

Investigations by local people have, however, revealed that the department's claim that logging in the Kodagu evergreens was being done on a " selection-cum-improvement basis " and that " only two or three dead, overmatured and fallen trees per acre " were being extracted, was an utter falsehood.

On July 16, a small group consisting of local people, forest officials, two reporters and an opposition legislator—trudged through the wet, muddy tracks of an evergreen

forest, braving leeches - and fording streams in the Western Ghats, to see the results of this "selection felling" for themselves.

As we made our way through the Ponganmalai range in Kodagu, the evergreen foliage from about our heads suddenly vanished. A coupe leased out to a timber industry stood before us with as many as 18 stumps in less than one acre. Trees both marked and unmarked, big and small, had been felled, despite the Forest Department's "selection felling" stipulation that industries be permitted to cut only two or three trees per acre in the coupes allotted to them.

Confronted with this evidence, forest officials dismissed this indiscriminate chopping of trees to "felling damages". Obviously, the department's Working Plants are a myth.

Indeed, according to the Forest Department's own statistics, in the particular 60 acre coupe we visited, leased to a timber industry, as many as 1,455 trees had been cut down, against the permission granted for 168. Given these figures, the forest official's explanation that the damaged trees were used only for firewood, sounds particularly lame.

After large scale protests in Uttar Kannara by Apikko activists against felling by contractors some coupes were allotted to Forest Labourers Cooperative Societies. In Karnataka, there are 17 plywood, two chip board, two match and two packing case manufacturing industries which together extract approximately 1·5 lakh cubic metres of softwood every year from various evergreen varieties in the ghats. The term of the existing leases has been curtailed to five years and the Forest Minister recently announced that once these leases expire, they will not be renewed.

The continuous exploitation of these forests has resulted in the steady invasion of deciduous species in the upper reaches of the forests and a great deal of soil erosion. Professor Madhav Gadgil, chairman of the Centre for Ecological Sciences at the Indian Institute of Science (IIS) in Bangalore and adviser to the Prime Minister on scientific matters has for long, been advocating that the control industries have on the resources of the forests should slowly be tapered off.

Says Gadgil who has done extensive research in the forests of Uttar Kannars. " The industries have a very high profit margin and there is an urgent need to carefully review and rationalies the pricing policy. Scientific knowledge which can match the rate at which the forests are being depleted is sorely lacking ".

The general feeling of outrage in Kodagu against such indiscriminate destruction of the the ghat forests was probably long overdue. P. K. Ayanna President of the Jan Jagriti Samithi (JJS) a voluntary social action group in Kodagu, says that the local people, who want a blanket ban on felling of trees in the entire district, feel that the funding for forestry is inadequate, especially when compared with the Forest Derartment's earnings from Kodagu, which total Rs. 5 crore annually.

The JJS also seeks immediate protection of the 600 devarkadus (god's forests) spread over 7,000 acres in the district, which are currently not only being exploited by the Forest Department and encroached upon by migrant. Keralites but are also the centre of smuggling activity. These sacred forests, which were assigned to particular deities in temples acted as the only places of ancient plantations. The temple authories were permitted to extract firewood for worship and for repair of the temples. The villagers also had a right of way through these forests. Last year, the devarakadus were transferred from the control of the Revenue Department to the Forest Department.

Although these forests fall under the reserve forest category and the Forest Department can evict encrochers, forest officials claim that it is a tricky business. Unless the government passes an unambiguous order on eviction, they are helpless. The proposal naw is to declare these minor forests in Kodagu as ' tree sanctuaries ' and develop them as model forests after Fencing them.

Cardamom cultivation in the district has also destoryed the ghat forests. Nearly 3800 acres of evergreen forests were leased to local people in 1953 for cardamom cultivation who have in turn sub-leased them to others. Although

the leases expired in 1970 and there was an order not to renew them. the government directed the Forest Department to permit the leasers to retain these plots for another 20 years Although the Forest Department is convinced that such cultivation in the heart of the forests has destroyed the ecology of the areas. It is helpless in the face of the strange government order.

The grwoing commencment of the people to protecting their forests is also evident in Shimoga, the high rainfall be it of Malnad. In village of Hunsur in the sagar taluka of Shimoga a group of chidren rushed to greet us, singing 'Vriksha raksha namma lakshya' (protection of trees is our goal). The adults recently took a vow that they would not fell even a single tree in the forests near their village and would not allow any contractors to fell them either. Now they zealously guard the forest says 35-year-old Nagappa, a villager, 'One member from every family in our village takes turns daily to guard the forest.' When asked about their sudden concern for the forests. Nagappa shoots back. 'Because if these forests disappear, we too will disappear.'

In fact, sagar has been adopted as the headquarters of the 'Save Tree Campaign' by the Vriksha Samaraksha Vedike.

Recently they have inspired a unique culture of gifiting saplings on special occasions. For instance, says Hegde. 'We make newly-wed couples plant a tree and ask them to look after it.'

Education and consciousness raising among the villagers on issues related to the environment are given a high priority here, The Vedike has been organising camps for youth clubs, mahila mandals and School children to help make the movement a success. Their slogans are short and simple: 'Save Malnad from turning Dry' 'Worship trees like you worship god.' 'Those who kill trees are rakshasas.'

One of the main targets of the Vedike are smugglers who have created havoc in the Malnad forests. Recently, they also launched a protest against the smuggling of frogs

legs unfortunately, the Culprits were allowed to go scotfree by the Forest Department.

Sagar has also been the centre of a controversy regarding the planting of eucalyputus in the area. About a year back, the government directed the Forest Department to identify all 'degraded' lands in Malnad and hand them-over to industries for eucalyptns plantations. The Government's decision to set up a Rs. 30 crore joint sector undertaking called the Karnataka pulpwood Limited (between the Karnataka Forest Plantations Corporation and the Birla-owned Harihar Poluybres) with the intention of bringing under eucalyptus cultivation 75,000 acres of land in the two high rainfall districts of Shimoga and Chickmagalur, was attacked by Jnanpith award winner, Dr. Shivaram Karanth, in an editorial in a local Kannada daily.

The people in these districts, too, protested against this move. To examine the government's claim that only barren lands would be used for cultivation, Arogya Vikasa Prakalpa, a voluntary agency, sponsored a physical survey of these lands in Chickmagalur and Shimoga districts. The study revealed that, contrary to the government's claim, the lands had a tree population of 50 to 200 trees per acre.

"The Karnataka government has recognised that 47 percent of the total annual grazing stock comes from evergreen, semi-evergreen and deciduous forests which constitute 15·1 percent of the forest area. This realisation, however, has not prevented the government from making available 75,000 acres of land in the high rainfall zone in the heart of the Western Ghats for growing eucalyptus," says S. R. Ramaswamy editor of a Kannada Journal and spokesman for the Mannu Rakshana Koota (Save Soil Committee). Ramaswami a critic of the government's forest policies, is bitter about the large-scale deforestation in the Malnad region which, he says is the direct result of government policy to feed the paper and pulp industries in the state. The Koota, which consists of several social action groups has been carrying on a sustained action against eucalyptus plantation in Malnad.

On January 6 this year, villegers from all over Sagar

taluka registered their protest against the take over of common village land by uprooting the boundary stones placed by the Forest Department after its survey. Last month, they filed a public interest litigation (PIL) in the Karanataka High Court against conversion of village common lands into commercial eucalyptus plantations by the Forest Department, alleging that the government had sacrificed the interests of the villagers in favour of a " capitalist industry ".

The people of Shimoga are tired of development projects and wary of government policies. " Even 20 years after the Ling-anammakki Dam was built, the poor still don't get electricity. They give up everything but get nothing in return". says Ananth Hegde. He points to an island where 6,000 people live marooned as the surrounding area was submerged when the Sharavathy Dam was built.

For the people of Tomari island, which consists of 20 villages the only means of transport is a launch for which they have to pay 25 paise per trip. Now the villegers are planning to file a PIL to demand free passage on the lauch, since it is no fault of theirs that they have been marooned.

Even more disturbing is the allegation by the local people that the last stretches of the forests, which survived submersion by the dam and which still remain on the island, will soon be destroyed when the government hands it over to the Mysore Paper Mills to grow acacia.

In sharp contrast to Shimoga, are the developments in Sirsi the small town in Uttar Karnataka. Here the Appiko movement brought to a halt over–extraction and clear–felling in the Western Ghats of the district. Today, the development of betta lands (minor forests in the village) is the main priority in Sirsi. Speatheading the betta improvement drive is a forest official - the Deputy Conservator of Forests (DCF), Praveen Chandra Pande.

When Pande took over as DCF in Sirsi inthe aftermath of the Appiko's first burst of activities, he had a choice either to continue with the Forest Department policy of confrontation with the people or build bridges with them. He chose to do neither. Instead, he decided to start his own movement. The

young official went from village to village, telling the people in chaste Kannada. "Let's foreget the fight and afforest."

Pande hap concentrated on motivating farmers to regenerate the minor forests adjoining their lands. He feels that 90 per cent of these betta lands have been degraded because they were seen as "no man's land". He has also promoted a host of nurseries and experimented with plantation, where both eucalyptus and local species have been grown to prevent single crop plantations.

As timber smuggling is a major problem, he has taken the local people into confidence and appointed village protectors. Incentives are also given to those who catch smugglers. Pande's main grouse against the appiko leaders is that they never directed their movement against arresting smugglers: 'They turned a blind eye even when they knew that smuggling was a menace in the district.'

The experiement of the Hulgoi Group Villers' Service Cooperative Society, which brought together farmers and scientists of the IIS's Ecological Field Research Station to develop the betta lands have contributed to the ecodevelopment of the region. This approach includes the rationalist's approach to the forests, set aside for the use of the villagers. replanting degraded tracts, modernisation of animal husbandry, such as stall feeding and fuel conservation with intro duction of improved cows.

According to Pande, there is a recommendation pending before government to supply improved stoves free of cost in sensitive forest arears to reduce the pressure on fuel wood: 'We told the government that in our district alone, we are losing nearly Rs. 4 crore every year in the form of subsidy of firewood supplied in our depots. We suggested that the government spend Rs. 2 crore and distribute free improved stoves to the villegers. That way, we can save every year Rs. 2 Crore, which was being spent on firewood subsidy, and firewood consumption will come down by 50 percent.

In Sirsi' work—albeit in low key—on enviornment protection is on. But a few kilometres away in the same district

enviroment groups are waging a tough battle with both the Centre and state government to sove the forests of Uttar Kannara from further destruction. Here, the high profilen opponents are environmentalist groups led by Dr. Shivrama Karanth, and M. R. Srinivasan. The issue is the saction of nuclear power plant in Kaiga, the heart of the virgin forests of Uttar Kannara.

This is the first time that environment action groups in the country have put up such a stiff resistance to a nuclear power plant. The protests have been soon widesperead and vocal that Chief Minister Ramakrishan Hegde had actually organised a round table meeting last year of the environmsnt groups and the nuclear lobby. But the meeting was a farce. Instead of a healthy dialogue between the two groups, the atomic energy officials delivered their standad talk, defending power plants and giving assurances that safety norms would not be violated.

The environment groups are particularly aghast at the selection section of the site for the Uttar plant. Uttr Kannara, they feel, heshad its fill of so-called development projects It has the notorious caustic soda factory, the Dandeli paper mlik the Kali, project and now power plant at Kaiga.

What has taken environmentalists by surprise is the fact that Ramakirshna Hegde, who a few years ago sat in satyagraha to protest against the sanction of the Bedti dam in, Uttar Kannara is today one of the foremost spokesmen for establishing the nuclear plant in the state. The state Govt. is affraid that the agitation may derive the state, of the much needed nuclear plant.

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Adopated from a report appeard in Express Magazine, September 7, 1986
by **Nupur Basu**

From Plywood to Poverty

AGUMBE, a small village amidst Western Ghat hills in Shimoga district, Karnataka, is popularly known a Cheerapunji of South India. It has a population of about 1000, mainly engaged in agriculture. Out of these are about 16. Harijan families, who are working as landless labourers They migrate to far off places in search of employment.

Manjappa, a middle aged Harijan from Agumbe said, 'Now we are at the mercy of the forest department. If they give work we are able to earn livelihood otherwise we have to suffer. However, the search for employment for Manjappa and other Harijans is a recent phenomenon. During his childhood days there was enough work as they were engaged in cane work. In all about 160 families from Agumbe, Halandur and nearby villages were traditional cane workers. They were skilled in basket weaving and other products used in rural areas. Cane was abundant in nearby forest and they went into the forest to bring cane. These families were totally dependant on cane work and they earned a reasonable livelihood. Though they had no land to cultivate, they were never unemployed. The forests nearby provided them a living.

However, the situation started changing about a decade back. The forest department imposed certain restrictions on bringing cane from the forests. It also levied some price for each headload of cane brought by caneworkers. This restriction created some hardship for traditional caneworkers.

But they were put to even more hardship when forest department suddenly imposed a total ban on cutting cane

from nearby forests. The reason given by forest department for imposing such a ban was that, the caneworkers have over exploited the cane from forests and that cane is getting extinct. In order to regenerate the canegrowth the government imposed the ban.

For a forest official and to an outsider this ban may seem a rational step to protect caneworkers's interest in the long run. However, the caneworkers's view is entirely different. Caneworkers do accept that cane reserves have dwindled in recent times. But they attribute this overexploitation to government's forest policy.

The forest department has allowed plywood factories to enter these forests. These plywood factories have logged the area for decades. While logging they select big and tall trees. These trees helped the regeneration of cane and to spread in length on the trunks of these trees. Once the trees were felled the cane had no support to spread. Again the plywood companies constructed huge roads in thick forest areas. While constructing these roads the caneroots were uprooted. This process of uprooting cane has put a stop to regeneration process. Plywood extraction over the years has decreased the availability of minor forest produce like honey and herbal nuts. Plywood companies have extracted water retaining trees from Agumbe forests. This has contributed towards drying up of streams, affecting agriculture.

The plywood companies are mainly responsible for the extraction of cane from the forests. These 160 traditional cane working families have been pushed to a state of destitutes by plywood factories.

The State Government has banned cane extraction but it has not banned plywood extraction. Moreover, in Karnataka, there are 17 plywood factories dependent on the state's meagre forests. These factories make a profit of nearly 500 per cent as they get wood at concessional rate. The destruction of people's resource base by these plywood factories is beyond imagination. The plywood factories are driving people to unemployment, poverty and destitution.

There is a caneworkers co-operative in Agumbe. But it is defunct. Another rich person has established a cane-weaving centre getting aid from state industries department. This centre gets cane from far off places. The centre employs outside workers, as they produce items only for urban centres. The local traditional caneweavers have no work in this cane centre. They cannot match the skills of outside workers, who are trained according to market demand.

The State Government is doing out 'schemes' to assist these landless labourers. The government has given green cards to them so that they can get rice at Rs. 2 per kg. and other essential items at concessional rate. But Harijappa asks 'What is the use of all this assistance, once they have taken our livelihood we will never be able to sustain or earn something to satisfy our basic needs.'

Subbalh Gauda of Malandur, another caneweaver said "In old days we had at least something to work so that we could feed our family. We never suffered from hunger. But now with no employment we do not have money to purchase the rice given at concessional rate to green card holders.'

The destruction of traditional people's resources is a recurring phenomenon. The plywood Industry has destroyed the sustsinable resource base of caneweavers. This plywood induced poverty is supported by the state government. On the one hand the governmet in Karnataka claims that it is a champion of poor people, but in practice it is continuing the process of destroying poor people's base. The decision to continue the supply of wood to these plywood factories at concessional rate in coming years is a clear indication that government is determined to destroy poor people's remaining resoutce. And then to cover up these lapses the same government would come out with some 'schemes.'

Pandurang Hegde
Financial Express
Jully 11, 1987.

Chaos in catchment areas

Time and again, enviromental and ecological experts have pointed out the lacunae in the forest policy and suggested reforms. They have demonstrated and launched movements to save the ecology.

But their's has been a 'cry in the wilderness' as it were, as the destruction of forests has continued unabated while the afforestation programme taken up by the Government has remained unscientific and short-sighted. The tendency with those at the helm of affirs has been to dub all those who fight for protection of forests and environment as 'vested interests'.

Mr. Pandurang Hegde of Sirsi, the leader of the now popular 'Appiko' movement in Uttar Kannada District.. has come out with more startling findings about the new dangers that loom large. He fears that the rivers the life-lines of our states, may, one day, go dry, looking at the massive destruction of natural forests in the catchment areas in the western Ghats, What little afforestation is being done has only woresened the situation, illconceived as it is. The major rivers such as the Nethravathi' Tungabhudra. Sharavati and Kali and their tributaries originate in the Western Ghats. The catchment areas of all these rivers are in chaotic conditions and have had adverse impact, in oneway or other, on the rivers.

Indiscriminate felling of trees for commercial purpose, gradual disappearance of mixed forests and mono-culture of fast breeding species and changes in the land use patterns in the catchment area shave resulted in soil erosion and siltation of rivers.

Mr. Hegde experienced these facts during his recent padayatra in the Western Ghats. During his two month padayatra begun on Feb 1 Mr. Hegde visited the origins of all the rivers in the

ghats from Talakaveri, the origin of the Cauvery in Kodagu to Ambuteertha, the source of the Sharavati in Shimoga district. His twin objectives were to study the conditions of the catchment areas and create awareness among the people about the need for preserving natural forests.

Inspired probably by the long march of Sunder Lal Bahuguna the leader of the 'Chipko' to save the Himalayan forests, Mr. Hegde's padayatra opened a new chapter in the movement. During the journey we met villagers and had an opportunity to learn the changing conditions and the charaterstics of the rivers.

In Brahamagiri the catchment zone of the Cauvery in Kodagu the Forest Department has taken up plantation of fast growing species like acacia and silver oak. This, together with coffee plantation over vast expanse of lands on the slopes of hills, has resulted in removal of shade trees exposing the tropical soil to sun and heavy rainfall. There has been gradual erosion of the soil and silting of rivers.

Destruction of forests in Kodagu started on massive scale especially after the district became part of Karanataka. Whlte large portion of forests has been given on lease to the plywood factories for felling, rubber plantation has taken place on an alarming scale, especially by the people of the neighbouring states.

The forest area in Devarkadu, which was about 10,000 acres in 1964, has been reduced to only 3000 acres now while the area of the coffee plantation in the district has increased from 46,708 hectares and that of the cardamom area from 11,474 hectares to 16,900 hectares during the 10 year period from 1974. This apart the tree cover has disappeared, exposing the soil to erosion and many rare species of flower trees have become extinct

The situation in the catchment areas of the Nethrayati, the lifeline of Dakshina Kannada district and its tributaries such as Kumaradhara, Shiseela, Kempuhole, and Kapila, has been equally alarming. While on one side most of the lands in the catchment areas and along the river path have been owned by the private tea and coffee planters, the plywood industry has taken toll of the trees on slopes of the Western Ghats.

The cocoa plantation in large areas, according to Mr. Hegde

is a cruel joke on the poor people of the villages The cocoa, produced at the cost of virgin forests reaches only the urban people.

The trees on the slopes of Charmadi range of hills, the main water-shed of the Netravathi are being cut by a plywood factory and the Forest Department has now planted casurina which cannot prevent soil erosion. With it is the problem of timber smuggling activities by the encroachers.

The practice earlier was to grow creca pepper, banana, coconut and paddy which was in tune with the ecology. But of late, rubber plantation has replaced all other crops in most of the areas. Government has also supported the rubber cultivation by setting up a rubber board and extending subsidy to the growers.

Mr. Hegde says, quoting reports of the National Institute of Virolgy, Pune, that large-scale destruction of forests in Belthangady area and the World Bank aided cashew cultivation programme was responsible for the outbreak of Kyasanoor forest disease which took the toll of several lives.

The bane of the Tungabhadra river has been the mining operations of the Kudremukh iron ore project. The authorities have hung a big board at Kudremukh which says : "We have moved mountains without disturbing the beauty of ot". But Mr. Hegde says, one actualy sees a shocking sight. Not only most of the mountain is chopped off for ore, but the debris is allowed to flow into the river. The giant slurry mix plant is releasing effluents which render the Bhadra waters red and muddy.

Agumbe, which was for long described as Chirapunje of South India, has been receiving less and less rainfall every year from 463" in 1962 to barely 297" in 1985. In Srinageri the forest cover has come down from 49 percent in 1965 to 39 percent in 1985 where as the expected forest cover is 66 percent. The plywood industries have been felling important species of trees such as "gulle", "neerathi" "rudrakshi" which play a major role in retaining water and soil.

In the catchment areas of the Sharavatiriver, laying of roads by the plywood factories for transport of logs has changed the

characteristics of the evergreen forests. The extensive cultivation of "lavancha", a commercial crop in the area has accelerated soil erosion which, Mr. Hegde may prove to be detrimental to the Linganamakki dam: One main reason for the State's repeated power crisis is storage of less water in the Linganamakki dam.

Mr. Hegde has prepared a detailed note on each of these rivers and their catchment areas based on the experience of his padayatra and sent the copies to the Union Minister for Water Resources, State Chief Minister and the Chief Minister of Tamil Nadu and Andhra Pradesh since two major rivers - Cauvery and Tungabhadra - flow into their States and the conditions of these rivers affect them as much as they do Karnataka.

He has made a few important suggestions to save the catchment areas. Firstly, felling of trees for commercial purposes must be immediately stopped. There are 17 plywood industries operating at different places in the Western Ghats though, admittedly by the authorities, the raw materials available in the forests are not enough for even three plywood iudustries. What is shocking is the fact that the Government has been yielding to the industrial lobby. An order was passed on June 11, restricting allocation of fresh forest areas for existing plywood industries. But within a month another order was issued allowing western India plywood factory to extract wood from Kodagu forests for another five years.

Mr. Hegde has suggested that felling of trees in the Western Ghats must be totally banned for the next 15 years as has been done in the case of Himalayan forests.

Secondly, the land-use pattern should be in harmony with the environment. Agricultural operations which do not harm the Western Ghats must be introduced. A scientific study on the catchment areas be made and plantations which help conserve the soil be taken up.

And thirdly, the Western Ghats Development Project must be reoriented.

H. G. Belgaumkar
Indian Express, Bangalore,
July 6, 1987.

Forest disease spreading from Karnataka

Kyasanur Ferest Disease (KFD), a tick-borne deadly virus infection, so far confined to the forest regions of Karnataka, threatens to strike the neighbouring States of Kerala, Maharashtra and Goa.

The debilitating disease was first noticed in 1955 in a few villages close to the Mainad forest areas of Shimoga district in Karnataka. And in the last three decades, there had been a significant increases in the occurrence, mostly among rural people, of this essentially zoonotic discase Black-faced and red-faced monkeys have been found to be the susceptibles for the disease and the virus transmitted to people by a particular type of hard tick.

"There is enough evidence to suggest that the disease might spread beyond the confines of Karnataka and affect particularly the neighbouring Kerala, Maharashtra and Goa States", says Dr. D. P. Narasimha Murthy, former Deputy Director of Communicable Diseases, who has worked in the detection and control of KFD for a number of years.

He told a workshop on health writing organised by the Press Institute of India that KFD was restricted to a few talukas in the Mainad forest areas of Shimog district for nearly 15 years since 1957, affecting mainly Sorab, Sagar, Shikaripur and Hosanagar taluks; limited to an area of about 650 sg. km.

Spread of disease : During 1974-76, the spread was noticed southwards involving newer areas and later it showed up in the west, including Honnavar and sirsi taluka of North Kanara. All

these areas are contiguous in Western Ghats. During 1976, outbreak in Honnavar was quite severe.

Dr. Narasimha Murthy said there were over 2000 suspected cases of KFD in 1983, possibly the maximum in the last 30 years. There appeard to be several factors responsible for the persistence or disappearnce of the infection among the people.

"But for the timely intervention of the Karnataka Govenment and the services rendered by the public health staff, the disease would have probably assumed a serious proportion and may have even become a major public health problem of the State. So, it will be even now necesaary for the neighbouring Kerala, Maharashtra and Goa States to take necessary precautionary steps" he said.

Asked what evidence suggested to the possible spread of KFD to the neighbouring States, Dr. Narasimha Murthy said the forest flora and fauna in the adjoining States were similar to original KFD areas. And the spread, he pointed out, was always suspected to be the result of ecological disturbances of an area and the presence of favourable factors related to agent, host and environment.

"Seasonal : The occurence of KFD was seasonal. It appeared during the post–monsoon period, reached its peak in March, April and May and disappeared during the rainy season. During summer, villagers who frequented the area for firewood, fell a victim to the virus. The possibility of a person getting the infection was most when one visited forest area where monkey deaths had occurred. "The virus has been isolated from dead monkeys and hard ticks collected from sack perons."

"KFD has also been isolated from animals, such as squirrels, rodents and bats. But in many animals, antibodies for KFD have been observed. The transmission of the disease occurs probably as a result of immature ticks acquiring the virus from any of the animals and transferring it to the monkeys or the people " He said the disease did not spread from man to man, nor was it transmitted by mosquitoes.

"The transmission of virus through tick is different from mosquito transmitted diseases. The pecularly is because the blood-suckers habit of the tick differs from that of the mosquito.

The tick will take blood metal after lodging in a suitable site to enable a continuous feeding for hours. It feeds on animal only three-four limes, its life. On the other hand, the mosquito can take a blood meal on any part of the body and transmit the disease to a larger number of susceptibles in a shorter time".

Dr. Narasimha Murthy said that as the KFD virus closely resembled RSSE virus prevailing in the Soviet Union, a field trial of RSSE vaccine was attempted. Even though aerological response in the KFD affected areas was favourabie, the vaccine did not prove all that successful. So, active research was now on to produce a vaccine which was to-give good results.

Appeared in The Hindu,
July 15, 1987.

Mining and its environmental impact

1. Mining

India has around 19 billion tonnes of proven iron ore reserves and the present consumption rate of the country is 16 million tonnes per annum. At the current rate of consumption these deposits are expected to last for quite a long time. In India the Minerals Mining Trading Corporation is responsible for extraction and sale.

Goa's iron and ferro-manganese mines are located in the interior talukas and 14% of Goa's land surface in the Bicholim–Senquelim Belt is covered by mines. Goa has 600 million tonnes of exploitable iron ore reserves. Although iron ore mining is a major industry, its contribution of Goa's Gross Domestic Product is only 10% whilst agriculture contributes 20%. The mining industry employs 15000 people and it is highly mechanised. The mines in Goa are of the open type and a very large quantity of ore rejects are strewn over agricultural fields and coconut palm groves, because only high grade ore having 60% iron content is demanded by Japan, which imports most of Goa's iron ore. Around 10,000 ha of land has been covered by mining dusts, thus making it unproductible.

Environmental Problems Associated with the Mining Industry

1. **Siltation and Flooding** : Siltation occurs due to the overflow of huge man–made mountains of mining rejects into the rivers. This raises the level of the river bed and causes the river to overflow its banks, thus flooding low lying areas, fields and damaging bunds.

2. Contamination of sand on river bed with mining rejects : In the areas far from the sea shore, river sand is used mainly for construction purpose. This extraction of sand is done using small boats as seen at Colvale. River sand is free from salt and good for construction purposes. However, today, most of the rivers have been polluted by iron ore rejects thus making the river bed sand unfit for construction purposes. Waste tailings from ore Processing Plant of M/S Sociedade deformento Pvt. Ltd at Maina are dumped directly into the river.

3. Draught for Navigation reduced : If sufficient draught is nat available, navigation is not possible. Our rivers are navigable for a couple of kilometers inland. Siltation due to dumping of rejects as well as soil erosion has reduced the draught of the rivers. Now at times navigation is possible only during high tide e. g. Pit No. 6 Pale mines of M/S Rajaram NS Bandekar Sons, Iron ore rejects have flowed into the river Mandavi affecting draught for barges.

4. Decline in Mussels, clams, oysters etc. : Formerly our rivers were a good reliable source of fish. It used to supplement the catch from the seas. However due to rejects flowing into the rivers and increased turbidity, besides other factors, our riverine fish catch has declined drastically. Mussels, clams, etc. have almost disappeared from our rivers. The stretch of the Mandovi River from Ribandar to Old Goa, which once abounded in such shellfish, is today practically devoid of them, as one NIO study has proved, due to the siltation of the riverbed with mining rejects.

5. Pollution : Washing of trucks and other vehicles near mines, has made the water turbid and polluted and is unfit for consumption. Barges spill oil and also pollute the rivers. Fish die with turbidity levels greater than 5000 mg/Ltr. Nitrogon fixation bacteria are reduced in soils polluted by mining rejects. It is observed that the ground water level in Usgao and Honda has fallon from 50 M above mean sea level to 35 M above mean sea level. Mining has seriously destroyed Agriculture in its vicinity due to overflow of rejects into paddy fields, ruining their fertility. The containment

walls built by mineowners, for these rejects, are at times washed away and **seepage of acidic mine drainage waters, is a major problem.** Mining of large tracts of land has left deep hollows on the land surface. There is no effort made by either the Govt. through legislation or by the mine owners to restore the mines by refilling the hollows. Excavated pits are dangerous – **Collapse of sides occurs in locations. Top soil is destroyed and regeneratisn of forest neglected.**

6. Atmospheric Noise and Chemical Pollution etc : Dust is a major problem in mining locations. Curchorem Rly. station faces this problem and so do mine workers also. It can cause respiratory problems. Noise at high levels can cause pain, headaches, lack of concentration and build up tension. Noise is an ever present problem in industrial activities. Noise is generally confined to machinery and vehicles. It is known to cause personal stress, and can affect the hearing system. Acid mine pollution occurs where minerals such as sulphides are exposed to oxygen from the air. Air makes these minerals more solube, so that they dissolve in water on contact, and form acids. To stop this a mine can be sealed flooded or back-filled, when mining work is complete.

7. Accidents to Humans : Mining accidents to human beings rank as high as those of other industrial activities. Some are fatal, like death, due to collapse of walls, explosives, etc. or serious, like loss of hearing, fracture of limbs, etc. Compensation for workers is often delayed and inadequate. Safety is generally lax. In 1971-75, on an all India basis, 1951 persons were killed and 13167 persons injured seriously in such operations.

8. Destruction of Floia & Fauna : Most of Mining concessions are in heavily forested areas in the interior talukas. Our forests are the home of a larg evariety of plant and animal life; some of these valuable species have alr ady been lost due to destruction of their habitat. Many plants / animals have not yet been identified: The genetic base is being destroyed by large clearing of forests for mining activities.

II SAND DUNES

Sand dunes are a sign of ecological balance between the powerful forces of the ocean (Wind, Waves and Current) on one side, and the natural resistance of the land on the other,

A stable sea shore has 2 main lines of sand dunes : (i) **A Sea Dune** which runs along the entire sea shore and (ii) **a Laod Dune** which runs parallel behind the sea dune about 100-500m from the sea shore. In between these two lines of dunes, lies a sandy desert with minor dunes and coconut palms.

Our forefathers built their coastal roads and dwellings behind the sand dunes in the area of tranquility This can be seen in all roads fram Cansaulim to Cavelossim and Candolim, Calangute, Baga. Beyond the road lie paddy fields. Today increasing quantities of sand is extracted from the sea shore for glass factories in Gujarat and for construction purposes nearer to home.

Mobor peninsular which is a narrow 'Chicken's Neck' hardly 250 m wide has been widespread sand extraction and was over run by a Surgestorm a couple of years age. Rajjar trucks have breached the land dumps in this area in 1977. In the summer of the year 1978 stormy wind sblew sand into fertile paddy... fields thus making them incapable of producing any food— crops. Mango and Coconut trees have yielded no fruits in this area since then.

In Caranzalem, the sea dune is missing, and heavy erosion began around 1928. A shore width of 65m has been lost. Along the coasts of Goa, especially in Chapora and Southern beaches, ilmenite and other rare earth metal deposits are found, which are being rampantly mined and exported. These dunes contain 45-65% ilmenite. These minerals can be used in superconductivity research.

Sand Dune Managemedt / Coastal Protection :

1. Conifers planted on dunes lower the water the table, soil acidity increases so does organic matter on the surface.

Soil is highly vulnerable to erosion when trees are removed. Disallow growth of trees which shade out dune grasses near the coast.

2. Develop aerodynamically stable shallow sloping/Seaward face to the coast dune, followed by fencing and plantations. Use fertilizer to aid establishment of grasses.
3. Halt extraction of sand for construction / industry and discourage building of road near dunes.
4. Control movement of people near the dunes. Many ecologists treat man as a highly destructive animal in the dunelandscape, because of his trampling on the protective grass cover on the dunes.

Conclusion

In order to minimise the ecological backlash from indiscriminate mining and sand extraction practices, the following suggestions are put forward.

— Legislation should be enforced regarding discharge of rejects and the restoration of mines.

— A mandatory Environmental Impact Statement should be undertaken before any future mining activity is started.

— Subject all present mining related projects to a socio—economic impact statement. Costs should be wieghed against the benetits.

Bonny Menezes
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St. Xavier's College

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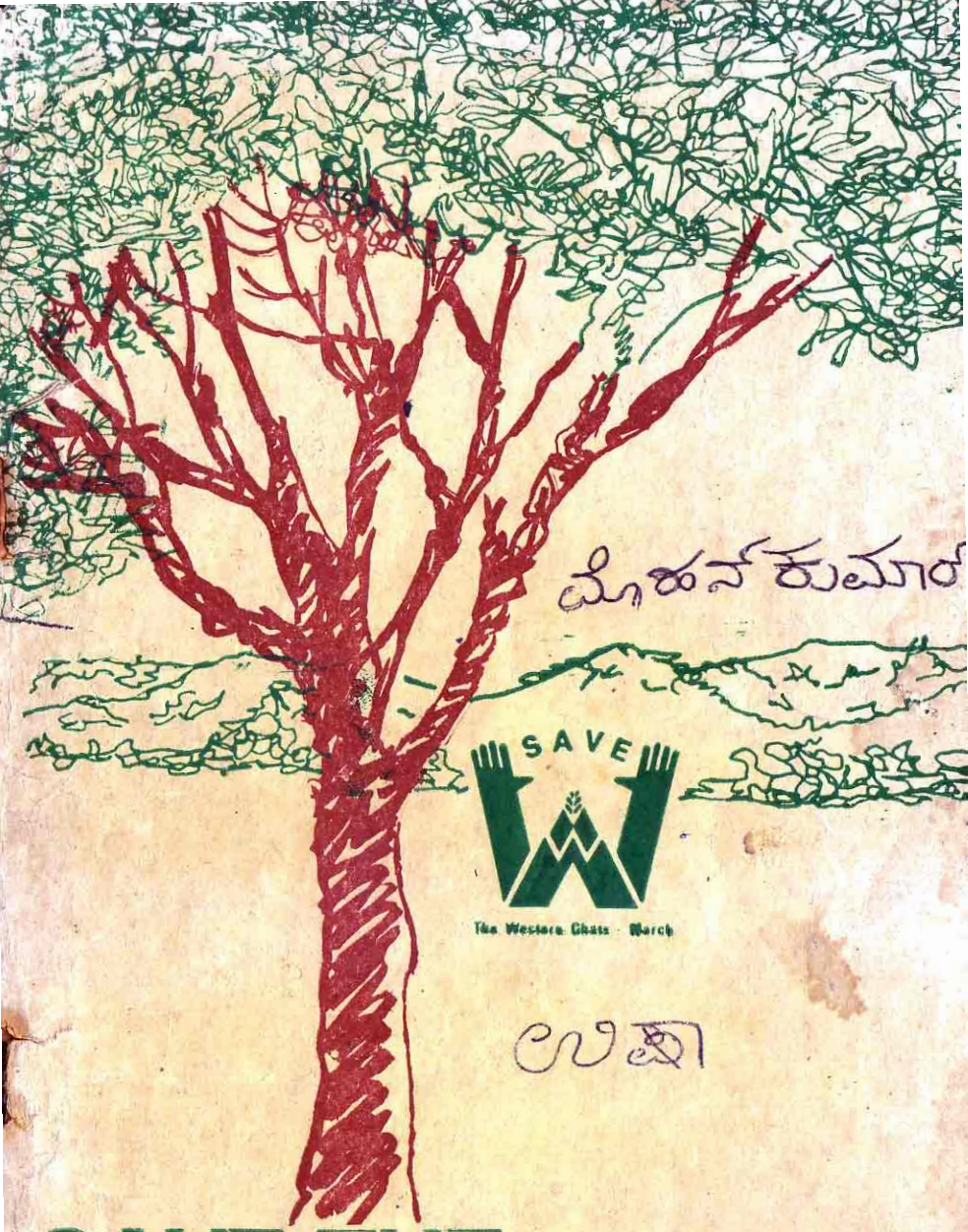

SAVE THE WESTERN GHATS - MARCH

AT A GLANCE

SAVE THE WESTERN GHATS - MARCH

[S. W. G. M.]

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7] Panduranga Hegde
8] Subramanya Hegde
9] S.Khomne Sudhakar
10] Dinakar Gangal
11] Ranjan Rao Yerdoor

Index

The main objectives of the March

1] To generate awareness among the people about ecology and related issues like denudation of forests, afforestation, preservation of wild life, natural resources etc.

2] To learn more facts about the nature and extent of ecological destruction of the Western Ghats.

3] To expose young Research Scholars to the real field situation / problems, so that they could view the problems in wider societal perspective.

4] To bring together all the Voluntary Organisations working in this region to formulate some long term common ecological action - programmes.

5] To encourage academic institutions including schools in the region to take - up afforestation and other ecologically relevant programmes.

6] To create suitable environment for effective co-operation between Voluntary Organisations, Government agencies, academicians and educational institutions in solving the ecological problems.

Foreword

The persistent efforts of a core group of environmental activists have borne fruit and an ambitious "Save the Western Ghats - March" is taking place. This march will begin on the 1 Nov. '87 from the two different ends of the Western Ghats and converge at Goa. This march aims to create awareness among the people about the importance of ecological balance and to highlight the role that the people can directly play in preserving our biosphere and creating a bright future. All the micro - level voluntary organizations have felt the need for creating a sustainable peoplebased awareness campaign by joining hands with one another. More than 140 voluntary organisations have come together on this issue to concentrate intensively in creating a mass support in the coming 95 days.

This movement hopes to involve people from different walks of life - Social activists, scientists, writers, journalists, academicians and to sensitize them towards the crucial role they can play in ecological conservation and to highlight the role of Western Ghats in the maintenance of India's environment. There is now realization of the dangers of large-scale degradation of the Western Ghats and the need to prevent this distruction and to rejuvenate the vegetation on the Western Ghats. But there has been a gap between realization and action. Now this march is seriously committed to fill this gap and develop a positive alternative to prevent ecological destruction.

We, the organisers, hope that, as a result of systematic efforts so far, a band of young - women and men will be

identified and committed to social justice and to organize the concerned people especially the poor sections, most affected by the degradation of environment as the protectors and enhancers of the natural resource base for their very survival.

This handbook 'Save the Western Ghats March at a Glance' will be helpful to all to get some quick information regarding the physical structure of the march which covers a distance of over 3,500 km. It can be a guide book for any environmental activist interested in the march and help create action oriented programmes in different areas.

-Kumar Kalanand Mani
Central Co-ordinator
SWGM

Day To day Programme for SWGM

[Route of the North Zone]

DATE	HALTING PLACE	CONTACT PERSON
1 Nov. 1987	Rangawali	Manohar Gawil
2 Nov.	Rangawali	Telepnone exchange
3 Nov.	Warase	Near S. T. Stand
4 Nov.	Mulher	Navapur Dist. Dhulia
5 Nov.	Ahwa	"
6 Nov.	Jakhana (Gujarat)	"
7 Nov.	Malunga	"
8 Nov.	Surgana	"
9 Nov. 1987	Mhaismal	Shri D. M. Bidkar
10 Nov.	Peint	Dang Sewa Mandal
11 Nov.	Peint	Sharanpur Rd., Nasik
12 Nov.	Harsul	"
13 Nov.	Waghire	"
14 Nov.	Trimbakeshwar	"
15 Nov.	Nasik	"
16 Nov.	Trimakeshwar	"
17 Nov.	Umarda	"
18 Nov. 1987	Mokhada	Shri Ram Deshpande
19 Nov.	Jawhar	M. Gandhi Sewa
20 Nov.	Wada	Mandir, Swami Vivekanand Marg, Bandra (West.) Bombay - 400 050
21 Nov. 1987	Vaiterna	Shri Shayam Khairkar
22 Nov.	Tansa	Gram Swarajya Samit
23 Nov.	Ghoti	At & Post Vikramgad
24 Nov.	Bari	Tq. Jawhar Dist. Thane.
25 Nov. 1987	Bhandardara	Shri Sudhakar Khomne
26 Nov.	Bhandardara	Ahmednagar College
27 Nov.	Pachnai	Ahmednagar - 414 001

DATE	HALTING PLACE	CONTACT PERSON
28 Nov. 1987	Khireshwar	Shri Sudhakar Khomne
29 Nov.	Khireshwar	Ahmednagar College
30 Nov.	Lakudpada	Ahmednagar - 414 001
1 Dec. 1987	Tokawade	Shri Vijay Sathe
2 Dec.	Dhasai	Shramik Mukti
3 Dec.	Khopiwali	Sanghatana
4 Dec.	Ahupe	Tad Ali Murbad
5 Dec.	Bhimashankar	Tq. Murbad Dist.Thane
6 Dec. 1987	Bhimashankar	Shri Kusum Karnik
7 Dec.	Kashele	at & Post Narodi Tq. Ambe goan, Puna
8 Dec. 1987	Karjat	Shri Darshan Shankar Academy of Development Sciences at & Post Khashele Tq.Karjat, Dist. Raigad
9 Dec. 1987	Khopoli	Ram Patankar Karma Prakalp at & Post Dhahiwali Tq. Karjat Dist. Raigad
10 Dec. 1987	Lonawala	Shri Madhu Mohite
11 Dec.	Lonawala	Potdar Bldg.,
12 Dec.	Shilimb	Shastri Nagar, Kalawa Thane
13 Dec. 1987	Tailbaila	Shri Sharad Shinde
14 Dec.	Pali	at & Post Shilimb Tq. Mawal, Dist. Pune
15 Dec.	Bhira	Ashok Saswadkar
16 Dec.	Shiroli	C/o. Joshi, Madhali
17 Dec.	Bademach	Ali, Pali Tq. Sudhagad
18 Dec.	Raigad	Dist. Raigad
19 Dec.	Raigad	»
20 Dec.	Raigad	»
21 Dec.	Shivthar	»
22 Dec.	Nigudghar	»
23 Dec.	Jor	»
24 Dec.	Mahabaleshwar	»

DATE	HALTING PLACE	CONTACT PERSON
25 Dec. 1987	Mahabaleshwar	Shri Vijay Paranjape
26 Dec.	Mahabaleshwar	C/o. W. W. F., 'Durga'
27 Dec.	Tapola	Erendawane - Pune
28 Dec.	Karwat	"
29 Dec. 1987	Patan	Kiran Shinde
30 Dec.	Koyananagar	C/o Principal,
31 Dec.	Patherpunj	Balasaheb Desai
1 Jan. 1988	Jawali	College, Patan
2 Jan.	Chandel	Kolhapur
3 Jan.	Udgiri	"
4 Jan.	Paralininai	"
5 Jan.	Amba	"
6 Jan. 1988	Amba	Shri Patil, Sarpanch
7 Jan.	Gajapur	Amba Grampanchayat
8 Jan.	Anuskura	Amba, Kolhapur
9 Jan.	Kolik	"
10 Jan.	Aslaj	"
11 Jan.	Gagan Bawada	"
12 Jan.	Manbet	"
13 Jan.	Dajipur	"
14 Jan. 1988	Dajipur	Shri Joshi
15 Jan.	Bambarde	Forest Guest House
16 Jan.	Sawarde	Dajipur
17 Jan.	Dhangarwadi	Kolhapur
18 Jan.	Patgoan	"
19 Jan.	Kitawade	"
20 Jan. 1988	Amboli	Shri Ogale
21 Jan.	Isapur	Amboli
22 Jan.	Tilarinagar	Kolhapur
23 Jan.	Dhamani	"

[Split as A & B to enter Goa]

GOA NORTH

DATE	HALTING PLACE	CONTACT PERSON
NORTH - A :		
24 Jan. 88	Imbrampur	Raju Talaunekar
25 Jan. 88	Pedne	"
26 Jan. 88	Calangut	Claude Alvares
27 Jan. 88	Shirgav	Ramesh Gaus
28 Jan. 88	Savoiverun	
29 Jan. 88	Ramnathi/Bandora	Girish Bhat & F.N. Lad
NORTH - B :		
24 Jan. 88	Surla Ghat	
25 Jan. 88	Querein	
26 Jan. 88	Kudne	Sagar Javadekar
27 Jan. 88	Velge	Narayan Desai
28 Jan. 88	Usgao	
29 Jan. 88	Ramanathi/Bandora	Girish Bhat & F.N.Lad

Route of the South Zone - Tamil Nadu :

1 Nov. 1987	Nagarcoil	C. P. Elango Freedom Fighter No. 2, Yadav St. Vadiveeswaram Nagarcoil
2 Nov. 1987	Thithuvilai	M. Meesa (Retd.) Circle Inspector "Mallik Manzil" Thithuvilai K. K. Dist.
3 Nov. 1987	Avalvoimozhi	C. P. Elango 2, Yadav Street Vadiveeswaram Nagarcoil
4 Nov. 1987	Kalakad	S. Viswanathan Wild life Wardon Kalakad Sanctionry Palayam Kotta Tirunelveli Dist.

DATE	HALTING PLACE	CONTACT PERSON
5 Nov. 1987	Papanasan (Ambasamudram)	C. R. Thirumurthy C/o Forest Ranger Ambasamudram
6 Nov. 1987	Alwarkurichi	C. R. Thirumurthy C/o Forest Range Alwarkurichi
7 Nov. 1987	Kuttalan	C. R. Thirumurthy C/o Forest Ranger Social Foresty Sencottah
	KERALA	
8 Nov. 1987	Achancoil	
9 Nov. 1987	Peruthommoozhi	
10 Nov. 1987	Vadasserikkara	Mr. Mammus George
11 Nov. 1987	Athikkayam	Madathil Parambil Kozhenchery Post Pathanamthitta Dist. Mr. L. G. Krishnan Thavelathil Vadekkethil, Kudassanada Post Pandalam Pathanamthitha Dist.
12 Nov. 1987	Mukkoothuthara	Mr. Joseph Nedum-
13 Nov. 1987	Pampavalley	puram, Mukkampatti
14 Nov. 1987	Vandipperiyar	Vana Samrakshana Samiti, Mukkuthuthara Post, Kottayam Dist. Mr. Sunny Paikada Melukavu Post Kottayam Dist.
15 Nov. 1987	Thekkady	Mr. Viswanathan
16 Nov. 1987	Vandanmedu	Alathur Union Bank
17 Nov. 1987	Kattappana	Munnar Post, Idukki
18 Nov. 1987	Idukki	Mr. Basheer, K.F.D.C.,
19 Nov. 1987	Adimali	Munnar Post, Idukki
20 Nov. 1987	Munnar	"
21 Nov. 1987	Marayur	"
22 Nov. 1987	Vandayam	"

DATE	HALTING PLACE	CONTACT PERSON
23 Nov. 1987	Pollachi	O. S. Ananda Kumar S/o O. P. Somasundaram, Udaya Kulan Tq. Pollachi Coimbatore
24 Nov. 1987	Parambikkulam	Mr. Rajan Robert
25 Nov. 1987	Nelliampathy Forest	State Bank of India Agali Post
26 Nov. 1987	Nemmara	Attappadi, Palghat
27 Nov. 1987	Palghat	Mr. P. Sethumadhavan
28 Nov. 1987	Mulli	Poklasseri
29 Nov. 1987	Thavalam	Vadakkumcheri Post
30 Nov. 1987	Silent Valley	Palghat
1 Dec. 1987	Artala Estate	Mr. T. Rajan, 'Kalom'
2 Dec. 1987	Kalikava	Hill Palace Buildings,
3 Dec. 1987	Nilambur	Kottakkal Post
4 Dec. 1987	Vazhikkadava	Malappuram Mr. M. Gangadharan, 'Kailasam' Parappanangadi Post. Malappuram
5 Dec. 1987	Gudalore	B.J. Krishnan, B.Sc.,B.L. Advocate Nahar Buildings Charring Cross Ooty - 643 001
6 Dec. 1987	Nulpuzha	Mr. M. Gangadharan,
7 Dec. 1987	Sultan Battery	Teacher,
8 Dec. 1987	Panamaram	Vijaya High School
9 Dec. 1987	Manantody	Pulppally Post Wynadu Mr. Vyasan Anappara, Chulliodu Post Wynadu
10 Dec. 1987	Kelakam	Mr. P. M. Balakrishnan
11 Dec. 1987	Irritty	Annoor Post

DATE	HALTING PLACE	CONTACT PERSON
10 Dec. 1987	Kelakam	Mr. P. M. Balakrishnan
11 Dec. 1987	Irritty	Annoor Post
12 Dec. 1987	Chemperi	Payyanur
13 Dec. 1987	Alakkodu	Cannanore Dist.
14 Dec. 1987	Pulingom	Mr. John C. Jacob 'Ashramam' Edatu Post Payyannur Cannanore

KARNATAKA

15 Dec. 1987	Talkaveri	Shri Achar, Mandal
16 Dec. 1987	Bhagamandal	Pradhan, Bhaga Mandala Post Kodagu Dist.
17 Dec. 1987	Murnadu	A. C. Subbayya Siddapur Post Kodagu Dist.
18 Dec. 1987	Madikeri	Shri D. S. Madappa and Shri Puvayya, Brahmagiri Weekly, Madikeri Post
19 Dec. 1987	Sampaje	Shri Damodara, Principal, Jr. College Sampaje Post
20 Dec. 1987	Sulya	Shri M. Balakrishna Mandal Pradan Sulya (D. K.)
21 Dec. 1987	Guthigar	Lion Muliya Thimmappayya, Mandal Pradhan Guthigar Jc. P. R. Padmanabha, President, Co-op. Society, Guthigar Sulya Tq.

DATE	HALTING PLACE	CONTACT PERSON
22 Dec. 1987	Subramanya	Shri Sri Vidyabhushana Swamiji. Subramanya Mutt Ln S.B Karnik, Lecturer S. S. P. College Subramanya (D. K.)
23 Dec. 1987	Nelyadi	Jc. Abraham Varghese Head Master High School, Nelyadi Puttur Tq. (D. K.)
24 Dec. 1987	Dharmastala	Sri Veerendra Heggade Dharmadhikari SriKhsetra Dharmastala Post Dharmasthala
25 Dec. 1987	Neria	Sri Rajagopala Hebbar Neria, Belthangady
26 Dec. 1987	Ujire	Sri Shridhar G Bhide Bhide House, Mundaje
27 Dec. 1987	Samse	Sri Jwalanaiah Samse Mandal Pradhan Post Horanadu
28 Dec. 1987	Kalasa	Dr. Narakesari Vet. Surgeon, Kalasa
29 Dec. 1987	Balehonnur	B. S. Vidyananda Bhat Sreenivasa Balehonnur Post
30 Dec. 1987	Bilalkoppa	B. N. Bhaskar Mandal Pradhan Bilalkoppa, Koppa Tq.
31 Dec. 1987	Shringeri	Shankara Narayan Sri Rata 'Manager' Shringeri Chickmagalore
1 Jan. 1988	Agumbe	Sri Dinesh Post Bharatipura Tq. Thirthahalli Shimoga Dist.

DATE	HALTING PLACE	CONTACT PERSON
2 Jan. 1988	Thirthahalli	Sri Raghuveer Thirthahalli Grama Bharathi Weekly Post Thirthahalli Shimoga Dist.
3 Jan. 1988	Kargadi	Sri Ravi Haniya Po. Haniya, Hosanagar Taluk Shimoga Dist.
4 Jan. 1988	Nittur	Sri Kallasanka Krishna Murthy, Post Nittur Tq Hosanagar
5 Jan. 1988	Tumari	Sri Ashok Suremane Post Tumari, Tq. Sagar Shimoga Dist.
6 Jan. 1988	Heggodu	Sri B. H. Raghavendra Post Bheemanakone Tq. Sagar Shimoga Dist.
7 Jan. 1988	Sagar	Sri Gurumurthy K. S. Sevasagar, Post Sagar Shimoga Dist.
8 Jan. 1988	Sasaravalli	Sri S. P. Satyanarayan Post Sasaravalli Tq. Sagar Shimoga Dist.
9 Jan. 1988	Talavata	Sri K. M. Seetaram Bachchagaru Post Talavata Tq. Sagar
10 Jan. 1988	Nagavalli	Sri Shambulinga C/o Sevasagar Past. Sagar Shimoga Dist.
11 Jan. 1988	Jog Falls	Sri H. P. Manjappa C/o Savasagar Po. Sagar Shimoga Dt.

DATE	HALTING PLACE	CONTACT PERSON
12 Jan. 1988	Siddapur	Sri Ravi Hegde Huvinamane Advocate Post Siddapur (N. K.)
13 Jan. 1988	Gerusoppa	Sri Narasimha Bhat Post Mavinakurve Tq. Honnavar (N. K.)
14 Jan. 1988	Upponi	Sri P. S. Bhat Post Upponi Tq. Honnavar (N. K.)
15 Jan. 1988	Kasarkodu	Smt. Meena Desai Snehakunja, Post Kasarkodu Tq. Honnavar (N. K.)
16 Jan. 1988	Kadthoka	Sri G. T. Hebbar, Teacher, New English School, Post Honnavar
17 Jan. 1988	Kumta	L. T. Sharma, Gandhi Nagar, Kumta (N. K.)
18 Jan. 1988	Ankola	V. J. Naik, Ankola
19 Jan. 1988	Arebail	Sri Subramanya Hegde Bedehaklu, Post Hosanagi Tq. Yellapur (N. K.)
20 Jan. 1988	Malavalli	"
21 Jan. 1988	Kaiga - Kadra	"
22 Jan. 1988	Karwar	Sri Purushottama 'Prajavani' Correspondent, Karwar (N.K.)

Group - A : Entering Goa as Goa South - A

Group - B1 : By Jeep to Hubli, Belgaum etc.,

Group - B2 : By Jeep to Sirsi, Haliyal etc.,

DATE	HALTING PLACE	CONTACT PERSON
B1 :		
23 Jan. 1988	Kusnur	Sri M. C. Doddamani Kusnur, Hangal Dharwad Dist.
24 Jan. 1988	Anchatageri	Sri R. V. Nagamule 2, Suyog Apartments, I. T. Road, Vidyanagar Hubli - 21
25 Jan. 1988	Dharwad	Dr. A. N. Kabbur, Malmaddi, Dharwad
26 Jan. 1988	Kulavalli	Sri Nabi Saheb Nadagada Saheb Hanchemane
27 Jan. 1988	Belgaum	Sri Rama Apte 1663/3, Ramling Khind, Belgaum
B2 :		
23 Dec. 1987	Sirsi	Sri Narendra Hegde Parisara Vardhini Yadalli Post, Sirsi
24 Dec. 1987	Bakkal	Prof. M. M. Hegde Bakkal, Arts & Science College, Sirsi (N. K)
25 Dec. 1987	Bhairumbe	Sri Narasimha Murthy Ashisar Post Bhairumbe Sirsi (N. K.)
26 Dec. 1987	Haliyal	Dr. Deshapande Haliyal (N. K.)
27 Dec. 1987	Supa	Sri Anant Hegde, Supa

GOA SOUTH

DATE	HALTING PLACE	CONTACT PERSON
SOUTH - A :		
24 Jan. 1988	Mashe	Manohar Parab
25 Jan. "	Palolem	"
26 Jan. "	Khola	Sarapanch
27 Jan. "	Covelossein	
28 Jan. "	Margoa	Dr. J. B. Sardesai
29 Jan. "	Ramnathi/Bandora	G. Bhat & F. N. Lad

(B1 & B2 will merge to become Goa South B)

SOUTH - B :		
28 Jan. 1988	Mollem	Sanguem
29 Jan. "	Ramnathi/Bandora (Via Dharbandara & Betoda)	G. Bhat & F. N. Lad

Programme Chart :

Date of convergence of the March :
Jan. 29, 1988 at Ramnathi Bandora Ponda

Exchange of Experiences Camp :
Jan. 30 & 31, 1988 "

Save the Western Ghats Conference :
Feb. 1st & 2nd, 1988 "

Common March - Ponda to Panaji :
Feb. 3rd, 1988 "

Public Meeting & Announcement of Follow up Programme :
on 3rd Evening Panaji, Goa

National Advisary Board :

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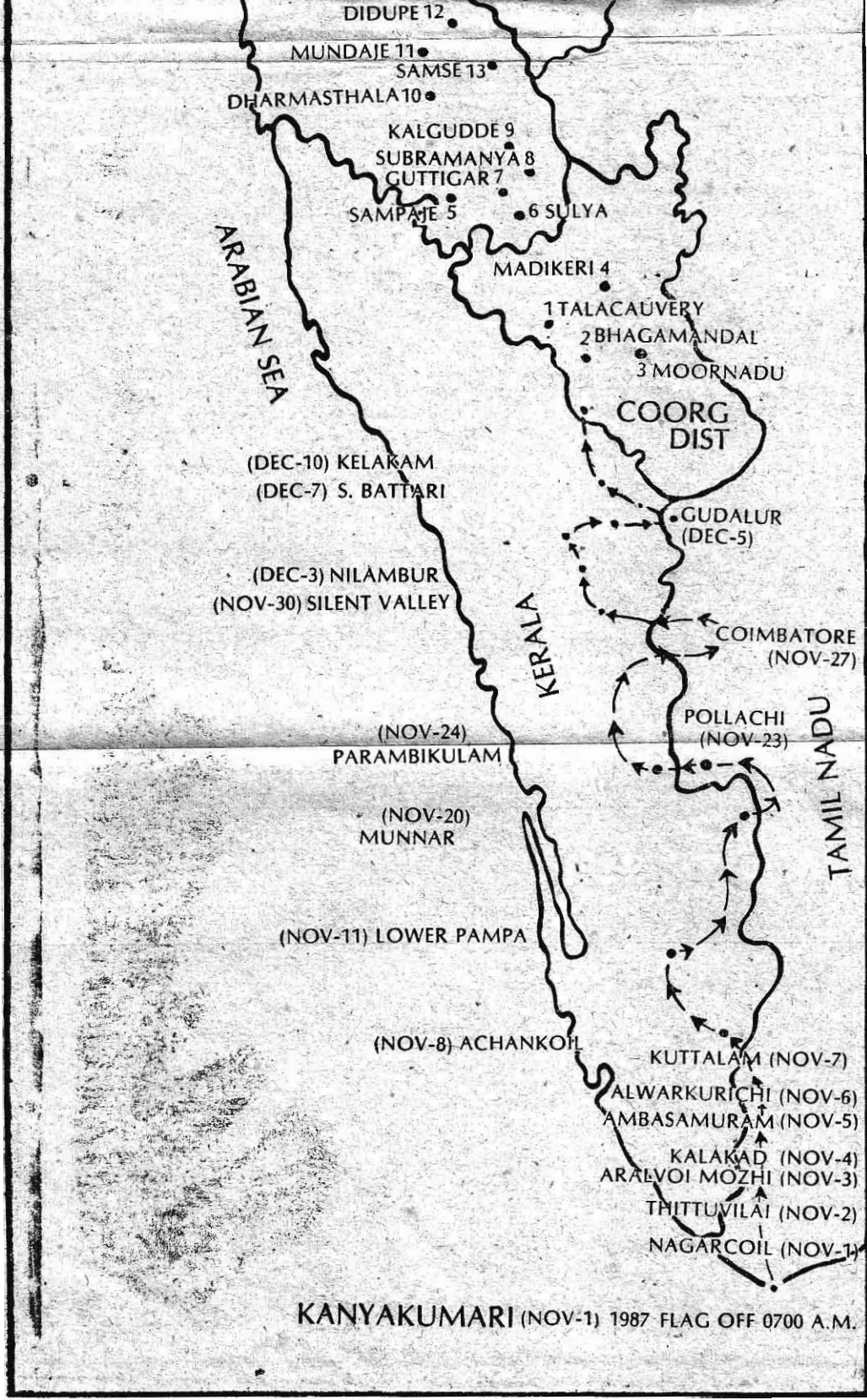
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