CHAPTER - IV

KALAKAD – MUNDANTHURAI TIGER RESERVE

The term Wildlife covers the entire flora and fauna of the country. In the past sport and hunting was commonly employed as a game. Now, the concentration is on the preservation, management and control of the faunal population. The reasons why wildlife should be preserved are not far to seek. The wild creatures like animals, birds, insects and reptiles should be preserved because they are part of our heritage. There is a peculiar aesthetic and intellectual pleasure that is obtained from the contemplation of wild creatures and the study of their habitat, movements and their inter-relationship with other wild creatures. Again, every species, namely, mammals, birds and reptiles play an important role in the maintenance of the balance of nature. Soil, water, flora and fauna of a tract are intrinsically connected to one another so as to maintain a natural balance and the connections are carefully worked out. A change in one will surely affect the others with far reaching consequences. For instance, the reduction of the natural food of tigers and leopards through excessive killing of their prey like deer and pig, results in their becoming cattle lifters. The elimination of these larger carnivores in turn results in increased damage to crops from pig and deer. Indiscriminate destruction of snakes has resulted in the population explosion among rats and mice which consume enormous quantities of agricultural produce. Bird life controls plant pests cheaply and effectively. Finally, there is a need to preserve wildlife for enjoyment of sport, shooting, photography or mere sight-seeing. Wildlife preserves are the prime attraction of tourists.1

Wildlife was abundant in the beginning of the twentieth century. The first sign of dwindling forests and diminishing wildlife began to be felt even during the First World War. Hence, measures were adopted to preserve wildlife generally and to safeguard some

1 Tamil Nadu Forest Department, Sixth Five Year Plan on Forestry (1978-1983) (Madras, 1978), pp. 105-06.
species considered to be in danger of depletion. Game laws were tightened. They were effective up to the period of the Second World War. When the war ended, the availability of enormous quantities of guns and ammunition became cheaper. Therefore, poaching became common and rampant. The authority for enforcement in the lower echelons was either helpless or indifferent.²

A sense of State responsibility for the preservation of country’s wildlife began to show itself in the early fifties. A Central Board for Wildlife was set up in 1952 followed by the setting up of State Wildlife Boards. Finally the Parliament enacted the Wildlife (Protection) Act in 1972 (Central Act 53 of 1972) to provide protection to wildlife. The Wildlife (Protection) Tamil Nadu Rules, 1975, followed on 21 January 1976. The Act had certainly ushered in a new era of prosperity for the wildlife.³

**The Mundanthurai Tiger Sanctuary**

It was constituted in the year 1962 under the Wild Birds and Animals Protection Act of 1912 (Central Act VIII of 1912) consisting of the Papanasam reserved forest and Singampatti ex-zamin forests primarily for the sheltering of the dwindling tiger.⁴ The very concept of a sanctuary for tigers and to provide preferential treatment for a carnivore was a pioneering action contemplated ahead of times. It was one of the foremost if not the first of its kind in the annals of wildlife management in India.

The Mundanthurai plateau is one of the richest regions in all forms of wildlife. The area had been subjected to licensed hunting till 1962 which resulted the decimating

of tiger population. In the interest of preservation of wildlife, the entire sanctuary was closed to shooting of all wild animals and birds in 1962.\(^5\)

In 1969, Kailash Sankhla, a field ecologist and a forest officer from Rajasthan, worked on the plight of the tigers in Indian forests for many years presented a paper entitled, “The Vanishing Indian Tiger” at the International Union for Conservation of Nature and Natural Resources. He pointed out that there were not more than two thousand five hundred tigers left in India. On hearing it the Government of India banned tiger hunting in 1970. After that the Wildlife Protection Act 1972 was passed which provided constitutional protection to the tiger and all the other endangered species of India. In 1972 itself, an all India tiger census was launched and it was found that there were only 1827 tigers left in India. Consequent by the ‘Project Tiger’ was launched on 1 April 1973. The Government of Tamil Nadu was very keen on the preservation of the tiger and other endangered species in the State. Based on the national policy, the State Government spelt out its policy to preserve the tiger along with all other wildlife. In 1977, Mundanthurai was declared Wildlife Sanctuary\(^6\) and in 1988 the Government declared the Kalakad-Mundanthurai as a ‘Tiger Reserve’ which is the first of its kind in Tamil Nadu and the seventeenth in India.\(^7\)

The following are the details of various reserve forests and ex-zamin forests (reserve lands) constituting the Mundanthurai sanctuary:\(^8\)

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Papanasam reserved forests

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Upper slope</td>
<td>--</td>
<td>25,845.7 Ha</td>
</tr>
<tr>
<td>Lower slope</td>
<td>--</td>
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</tr>
<tr>
<td>Hill enclosure</td>
<td>--</td>
<td>76.7 Ha</td>
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<tr>
<td>Addition to lower slopes</td>
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<td>0.9 Ha</td>
</tr>
<tr>
<td>Kololi enclosure</td>
<td>--</td>
<td>3.6 Ha</td>
</tr>
<tr>
<td>Singampatti ex-zamin forests (part of Ambasamudram range)</td>
<td>--</td>
<td>8,117.4 Ha</td>
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<td>Singampatti ex-zamin forests (Part of Nanguneri range)</td>
<td>--</td>
<td>14,041.3 Ha</td>
</tr>
<tr>
<td>Manpottai reserve forest</td>
<td>--</td>
<td>502.8 Ha</td>
</tr>
<tr>
<td>Therkuveeravanallur</td>
<td>--</td>
<td>1,290.3 Ha</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>--</td>
<td><strong>57634.0 Ha</strong></td>
</tr>
</tbody>
</table>

The sanctuary is situated in the Ambasamudram taluk, in the south west corner of Tirunelveli district. It lies between 77°10'-0' and 77°20'-30' east longitude and 8°30' and 8°53' north latitude. It is bounded by Tenkasi taluk in the north, Vickramasingapuram, Therkkukallidaikurichi, Therkku Viravanallur, Kadayam, Perumbathy, Mela Kadayam, Govinthaperi, Sivasailam in the east, Ambasamudram taluk in the south and Kerala State boundary in the west. The sanctuary can be reached by rail, road and air. The nearest railway station is at Ambasamudram, seventeen kilometer from Mundanthurai. The nearest air ports are at Thiruvananthapuram 160 kilometer away and Madurai 190 kilometer away.

The climate in general is hot and dry in the plains and also in the foothills upto an elevation of 300 meters. It becomes pleasant during November, December and January. The entire sanctuary experiences comparatively a better climate round the year except during summer months. In the higher elevations of above 500 meters the climate is cool and pleasant throughout the year. It receives south west monsoon from June to August.
The north east monsoon from October to December is usually unreliable. In three years, 1973, 1974 and 1975 there had been drought in this division. Occasionally, there are light irregular showers during January to May. The failure of these showers invariably heralds forest fire in the ensuing summer. The configuration of the ground, the composition and depth of soil and the degree of drainage which effect on the distribution of vegetation types, which along with water sources, influence the distribution of fauna and flora.

Mundanthurai forests are very rich in their type and value. It consists of unique types of forests. The following types of forests occur in the sanctuary:

1A/C3 Southern Hilltop Evergreen Forests
1A/C4 Southern Tropical Wet Evergreen Forests
2A/C3 Tirunelveli Semi Evergreen Forests
3B/C2 Southern Moist Mixed Deciduous Forests
4E/RSI Tropical Riparian Fringe Forests
5A/CI(b) Dry Teak Forests
5A/C3 Southern Dry Mixed Deciduous Forests
6A/C2 Karnatic Umbrella Thorn Forests
8A/EI Ochlandra Reeds
11A/C1 Southern Montane Wet Temperature Forests and Grasslands of low and high altitudes.

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These forest types and sub-types exhibit considerable local variation in climate. Each forest type is taken as habitat type and the transition zone from one type to another is gradual under each type. These transitional zones favour wildlife.\textsuperscript{10}

Many perennial rivers originate in this forest and the chief river is the Tambiraparani and its tributaries. The other rivers are Pambar, Mylar, Karaiyar, Manimuthar, Ramanadhi, Kadananadhi, Servalar and Jambunadhi. These water sources are well distributed all over the sanctuary and serve as natural reservoirs to the wildlife.

Mundanthurai and the adjoining hills have been the home of varied forms of wildlife. Tiger is the predominant carnivore. Panthers and other smaller predators were found in large numbers. The herbivores population includes elephant, gaur, sambar, cheetah, deer, Nilgiri tahr, wildbore, porcupine, Malabar squirrel, hares and so on. The status of gaur, Nilgiri tahr and cheetah is precarious. India is the home of eighteen non-human primate species and in Mundanthurai five non human primates are found in their niches in proximity. They are the Lion-tailed macaque, Bonnet macaque, Nilgiri langur, Common langur and Slender loris. Out of these, Lion tailed macaque is an endangered species.\textsuperscript{11} Among carnivores five tigers were estimated to exist in this sanctuary in 1984. The tigers might lie in location far remote from each other and there were no signs of reproduction among the population in the recent past. Any hope of saving tigers here should revolve around changing its population features by the translocation of more young animals of both sexes. The tigers have not been conclusively sexed and no evidence of young ones has been found. Panther population is good. A total of thirty three panthers were reported during the census conducted in April 1984.


\textsuperscript{11} Mangalaraj Johnson, \textit{Management Plan}, pp.159-161.
The sanctuary is rich in reptiles. It is a good habitat for python and king cobra. Other snakes are whip snakes, russel viper, green pit viper, common pit viper and common krait. Monitor lizard is fairly common in the drier tracts of the sanctuary. Tortoises are found along the river. The sanctuary also has a rich avi fauna. Hornbills are commonly seen in the wet evergreen and moist semi evergreen forest of the sanctuary.

Many of the country’s wildlife have been threatened due to ruthless exploitation of their habitats, poaching and other abuses by human beings. Tiger, leopard, elephant, Nilgiri tahr, cheetah, Nilgiri langur and lion-tailed macaques are the endangered and threatened species available in the Mundanthurai sanctuary.\textsuperscript{12}

The special objective of the management of this sanctuary is the conservation of tiger. Not long back, this sanctuary was very rich in carnivore population including tiger. K.P. Doraisamy, Wildlife Warden, in his management plan of Mundanthurai sanctuary (1989-90 to 1998-99) stated that the ecosystem of the sanctuary was “under threat due to inhabitation by human population, construction of hydel projects, pressure on the forests for fuel and grazing, bus transport even during night hours.”\textsuperscript{13}

From 1891, these forests were worked on a regular basis under the principle of sustained yield. The Kannikatty zone was subjected to selection felling\textsuperscript{14} with a girth limit of seven feet for sleepers from \textit{Mesua} in the year 1927. More important evergreen species were planted and the seeds dibbed. But the success of regeneration was not appreciably good. Kodamadi areas were also subjected to selection felling through the agency of contractors. However, with the object of preserving the catchments of the more


\textsuperscript{13} Doraisamy, \textit{Management Plan}, p.53.

\textsuperscript{14} Methodical removal of exploitable trees either singly or in groups with a view to producing a new crop from self-sown seedlings.
important rivers, the catchment areas were given complete rest by prohibiting felling in total.15

Timber-cum-fuel working coupes had been worked on contract system upto 1975 in the areas of Mundanthurai and Sivasailam forests and all the coupes worked were stopped after the division was declared as a sanctuary. The areas worked for coupes had been planted extensively with teak and softwood species, most of which had failed repeatedly. As a result, Mundanthurai had been depleted considerably.16

The depletion of these forests was also attributed to the heavy grazing and removal of firewood by head loads. The pressure for grazing inside sanctuary came from the cattle of villagers around the sanctuary. Many villages exist at the fringes of the hills in Papansam and Ambasamudram range. Most of the people living in the villages are agriculturists and they keep cattle for their agricultural use. Since long past these cattle were allowed to graze on permit system. There were 5000 cow units and the forest official issued permits to cattle owners at the rate of four rupees per cow, eight rupees per buffalo and two rupees per sheep. Apart from the village cattle, the cattle owned by the electricity employees around 1000 grazed in the forest. Grazing “illegally without permit” was also a common feature. Due to heavy grazing, forests were denuded and made practically devoid of any grass for grazing. The cattle caused a competition for herbivores for their food. This had caused considerable damage to the population of herbivores.17

16 Doraisamy, Management Plan, p.18.
17 Ibid., pp.53, 73 and 74; Administration Report of the Tamil Nadu Forest Department for the Year 1985-86 (Madras, 1987), p.60.
As early as 1944 cardamom leases were granted to private contractors by which twenty four cardamom blocks with an extent of 392.40 hectare were leased out and Rs.250 was collected per hectare per annum.\textsuperscript{18} The lessees were allowed to raise cardamom without disturbing the existing vegetation. During 1979, the Government issued orders by which the renewal of all cardamom blocks inside the sanctuary was banned.\textsuperscript{19} Consequently, the cardamom leases were assumed by the forest department after the expiry of lease period or for any violation of conditions. So far twenty one cardamom blocks were resumed by the forest department. The cardamom lease in the upper slope in Valayar and Kannikatty had contributed much to the depletion of soil, resulting in the damage to the habitats and ecological riches.\textsuperscript{20}

Minor forest produce units were leased out yearly to contractors in Mundanthurai and Sivasailam areas upto 1980 and considerable revenue was realised to the Government. During 1981, Kanikudiyirppu Hill Tribes Cooperative Society was formed\textsuperscript{21} and all minor forest produce leases were allotted to the society upto 1984. From July 1984 onwards all forestry working including minor forest produce collection were stopped and the forest produce was left for the use of wildlife.\textsuperscript{22}

Within the sanctuary, due to the stoppage of fuel coupes since 1975, the pressure on firewood from the local people had increased and lots of head loads of firewood were illegally removed daily. The practice of illegal removal of firewood by the public had

\footnotesize{\textsuperscript{18} G.O.No.1357, Forests and Fisheries, 11 Oct. 1982; G.O.No.564, Forests and Fisheries, 1 June 1985.}

\footnotesize{\textsuperscript{19} G.O.No.84, Forests and Fisheries, 9 Feb. 1979.}

\footnotesize{\textsuperscript{20} Doraisamy, \textit{Management Plan}, pp.54 and 72.}

\footnotesize{\textsuperscript{21} G.O.No.486, Social Welfare, 8 July 1981.}

\footnotesize{\textsuperscript{22} Letter No.70175 / 13/83 - 15, 6 Feb. 1984.}
disturbed the animal habitats particularly in Mundanthurai. The forests were made open and jungles were damaged.\(^{23}\)

During 1939-42, Upper Dam was constructed inside the forests across the river Thambaraparani and a vast area was submerged. Due to the construction of Lower dam and settlement of Electricity Board Colony, people intruded inside the forest much freely and forest suffered due to the repeated cutting of the undergrowth and understorey for firewood. The area around the Agasthiar falls “once existed as habitat for tigers… now exists as denuded rocky patches.” The labourers and contractors for the dam work were brought from outside and were allowed to stay inside the forest. Some of these people after completion of dam work had settled in Karaiyar by encroaching lands. Again, Servalar hydel dam across the river Servalar was constructed and completed in 1988 with a Hydro Electric Generation of 28mw. This project made a severe threat to the ecosystem in Kodamady areas and many animals disappeared due to blasting of rocks and large clearing of natural evergreen shola forests.\(^{24}\) The movement of people had increased due to this construction and they caused much damage to the existing forest.

From 1914 onwards four Kani hill tribes had settled in the forests. They were brought up from Kalakad region by English people to carry out plantation works and felling coupes. Initially, they settled in different places where forestry operations were undertaken. At last they settled in four colonies, namely, Agasthiar Kani Kudiyiruppu, Servalar Kani Kudiyiruppu, Mylar Kani Kudiyiruppu and Injikuli Kani Kudiyiruppu. The population was around 400. The damage to the forests in their settlement was considerable. Again nearly 2000 people lived within the limits of the sanctuary in connection with power generation, including the dependents of the staff. These people

\(^{23}\) Fuel coupes had been worked regularly in Koiltheri, Padarmalai, Aladiyur and Sivasailam forests upto 1975. Doraisamy, Management Plan, pp.74-75.

\(^{24}\) Doraisamy, Management Plan, pp.53 and 55.
created more damage to the forests by way of removal of firewood and sending their cattle inside the forests for grazing without even getting any permission. Since their population was more, they always joined together and tried to act against the interests of the forest department and actions of the staff. Singampatti ex-zamin forests were not properly controlled and were allowed to cutting and felling repeatedly which resulted in the denudation of forest. Again, the ex-zamin had leased out over 8000 hectares to Bombay Burma Trading Corporation for raising plantation crops, tea, coffee and cardamom. They clear-felled the natural forests for raising these plantations which resulted in heavy damage to the eco-system of that area. There were about 5000 people residing inside the sanctuary limits for the maintenance of their plantations.25

Once the forests were allowed for fuel coupes, construction of dams and cultivation of plantation crops, the wildlife were exposed to a lot of threat and poaching. Thus, their population decreased considerably. Licensed hunting and folli dol poisoning by local people caused an irreparable loss to tiger and other carnivore population. Doraisamy in his management plan of Mundanthurai sanctuary pointed out that “if the forests and wildlife are protected in tight, at least for 10 years from now the entire eco system can be built up.”26

J.Mangalaraj Johnson, Wildlife Warden, Mundanthurai Sanctuary, prepared the first management plan for the Mundanthurai Tiger Sanctuary for a period of ten years, from 1 April 1978 to 31 March 1987. The main objectives of the management plan were:27

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25 Ibid., pp.16, 56 and 96.
26 Ibid., p.54.
1) to maintain the ecological stability of the Mundanthurai sanctuary, which is crucial to the economy of Tamil Nadu in general and the Tirunelveli district in particular;

2) to conserve carnivore population of this region especially the tiger and the panther by providing preferential treatment;

3) to identify causes for the dwindling population of herbivores and to adopt suitable techniques for their ideal distribution;

4) to conserve all the five non-human primates existing by taking special steps;

5) to provide facilities for undertaking research in collaboration with Universities, Bombay Natural History Society and other related forest research institutions;

6) to undertake botanical and ornithological survey of the sanctuary and to establish a herbarium and a museum for future study;

7) to encourage wildlife tourism cautiously;

8) to create and propagate wildlife awareness among the school children, college students and villagers by producing booklets and other related material;

9) to involve local tribals and villagers around the sanctuary in the efforts for conservation by employing them in new jobs created;

10) to control overgrazing and prevent ecological convulsions caused by excessive usage by people residing within the sanctuary;

11) to carry out comprehensive investigation on the ecological damage caused by construction of dams and suggest ways to prevent future damage;
12) to establish an orchid garden at Kannikatty to collect and house all orchids found in the western ghats and in south India and

13) to undertake a census of all animals in the sanctuary and to gather data necessary for the management of non-human primates, hoofed mammals, carnivores and birds.

To achieve the different objectives, an intensive study of habitat behaviour of carnivore and large hoofed animals should be undertaken. Based on the study, long term conservation measures should be finally proposed. To achieve this, a research centre to accommodate wildlife library, herbarium and museum was proposed. The establishment of such a centre at Mundanthurai would be a permanent store house of reference for all future workers. For encouraging wildlife tourism, Mangalaraj Johnson proposed three dormitories, one rest house, tree top houses, log cabins, watch towers and necessary staff. For the management of herbivore population in the sanctuary, habitat manipulation, food production, water development and cover improvement should be undertaken. To attract birds, fruit and shade trees should be planted up. Rejuvenation of habitat should be undertaken by direct seedling as well as by transplanting. Water development works should be undertaken by providing new water holes, improving springs and seeps, water catchments and constructing gusslers. Protective cover and nesting cover should be improved after locating the places of immediate necessity.\(^{28}\)

To achieve the above-mentioned objectives, he proposed to increase number of staff and their salary. The payment of staff for ten years was estimated at Rs.30,04,800. Total expenditure proposed for all works for the plan period from 1981-82 to 1990-91 was Rs.1,03,04,500. Details of expenditure proposed is given below.\(^{29}\)

\(^{28}\) Ibid., pp.215-221.

\(^{29}\) Ibid., pp.267-303.
<table>
<thead>
<tr>
<th>Year</th>
<th>Rupees</th>
<th>Year</th>
<th>Rupees</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>1982 – 83</td>
<td>11,24,000</td>
<td>1987 – 88</td>
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<td>1983 – 84</td>
<td>14,49,400</td>
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<td>1985 – 86</td>
<td>13,99,500</td>
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<td>1,67,500</td>
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</table>

K.P.Doraisamy, Wildlife Warden, prepared the management plan of Mundanthurai Sanctuary from 1989-90 to 1998-99. According to his plan, the general objective of management of this sanctuary was to bring the areas to their pristine ecological conditions by completely eliminating biotic interference. The specific objective of management plan was to conserve the highly endangered species of tiger and lion-tailed macaque together with their habitat. Another important objective was to utilise this area as a centre for eco education of promoting wildlife tourism.

According to him the priorities were: 30

1) to conserve the endangered species;

2) to identify the cause for the dwindling herbivores and take necessary measures for their ideal distribution. Unless their species are protected, population of carnivores would be affected;

3) to maintain the ecological stability of the sanctuary;

4) to involve the local tribals by employing them in new jobs created;

5) to create and propagate wildlife awareness among student community and villagers near by the sanctuary;

30 Doraisamy, Management Plan, pp.84-86.
6) to regulate wildlife tourism and control grazing;

7) to undertake the research works in order to maintain healthy relations with all users of natural resources of the sanctuary and

8) to undertake the census of all animals and gather data necessary for the management of wildlife.

For administrative convenience he suggested that the sanctuary might be divided into core zone, buffer zone, tourism zone and special development zone. The core zone would be free from all disturbances especially human interference. In the buffer zone, habitat improvement works would be carried out. In the tourism zone, works for the development of tourism would be carried out like providing transport facilities, log houses for stay, watch tower and construction of more rest houses at habitat sites. In the special development zone, intensive plantation work would be taken up for improving the degraded forest areas.\(^{31}\)

Fire was not rampant in the sanctuary. Occasionally, it occurred in the areas “where human movements are existing”. This fire would be controlled by effective fire fighting operations which needed special squad and fire fighting equipments.\(^{32}\)

Grazing was at its peak in the sanctuary and to control grazing, many grazing grounds in the plains in Government lands could be established which would mitigate the problems to a certain extent. He pointed out that “it seems to be highly impossible to control the grazing totally inside the forest immediately”.\(^{33}\)

\(^{31}\) Ibid., pp.87-89.

\(^{32}\) Pramod Kant and C.S.Rangasamy, Project Report of Mundanthurai Sanctuary, p.11.

\(^{33}\) Doraisamy, Management Plan, p.90.
As far as poaching is concerned, it is surprising to note that “no poaching cases had been reported in the sanctuary in the past few years.” The strength of the staff was inadequate to control the poaching incidence in total. Hence, he suggested at least one Forester with two Forest Guards in each range separately for detecting poaching cases and dealing with related matters, checking of gun licenses and so on.  

He also suggested payment for crop damage outside the area by herbivores and occasional cattle lifting by the panthers. He said, “the Wildlife Warden may be fully empowered to sanction the compensation and disburse the loss immediately. Only then will the people support the idea of wildlife conservation to the extent possible instead of showing their hatred of the idea”.  

As far as administrative staff is concerned only selected and interested staff might be posted, preferably young and they may be trained adequately for sanctuary management. Forests in the past, primarily have served the more pressing demands of timber, grazing and water. Now the wildlife conservation has become the primary object and all other operations have been stopped. Now operations like water and soil conservation measures and habitat improvement works have come into being. To handle the management easily only trained staff may be posted in the sanctuary. He pointed out that the strength of staff was very much inadequate for the regular protection works. To carry out the new works, technically skilled personnel is needed. He suggested that the Rangers might be provided with jeeps, the Foresters with motor cycles and the subordinates with cycles. They might be provided with walky-talky, wireless facilities and adequate arms and ammunition with adequate powers to act on the enemies and forest

34 Ibid., p.92 and 102.
35 Ibid., pp.94-95.
intruders. Otherwise it would only be imaginary to develop this sanctuary which had “threat from all sides”.  

To achieve his objects, he prepared a budget. The total expenditure was as follows:  

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<thead>
<tr>
<th>Year</th>
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The Kalakad Wildlife Sanctuary

In view of the precarious condition to which some of the wildlife species had been brought by the depredation of their habitat and also illicit poaching, the Chief Conservator of Forests proposed to the Government to notify the Kalakad reserve forest in Tirunelveli district as a sanctuary for the protection and development of wildlife. The Government of Tamil Nadu considered that the Kalakad reserve forest “is of adequate ecological, faunal, floral, geomorphological, natural and zoological significance, for the purpose of protecting, propagating and developing the wildlife and their environment.” Hence the Governor of Tamil Nadu, in exercise of the powers conferred by sub section (1) of

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36 Ibid., pp.98-99.
37 Ibid., p.201.
section 18 of the Wildlife Protection Act 1972, declared Kalakad reserve forest as a Wildlife Sanctuary in 1976\(^ {38}\) and brought it under the control of a Wildlife Warden on 1 April 1977 for an integrated, effective and scientific management of wildlife and forestry practices.\(^ {39}\)

The Kalakad Wildlife Sanctuary is situated in Nanganeri taluk of Tirunelveli district. It occupies the south western part of the district. It lies between latitudes 8\(^ {0}\) 25'N and 8\(^ {0}\) 35'N and longitudes between 77\(^ {0}\) 25'E and 77\(^ {0}\) 35'E. The whole of Kalakad reserve forests of 22,358.47 hectares has been constituted as sanctuary. Therkuveeravanallur reserve forest form the northern boundary, the vast stretches of the uncultivated private lands forms the eastern boundary, the mighty Mahendaragiri peak and reserved forest form the southern boundary and the Mundanthurai Tiger Sanctuary and the Bombay Burma Trading Corporation tea estates form the western boundary.\(^ {40}\)

Tirunelveli and Nagercoil are the main towns close to Kalakad sanctuary, 45 kilometers and 50 kilometers away from Kalakad respectively. The nearest railway station is Nanguneri on Tirunelveli to Kanyakumari line and Cheranmahadevi on Tirunelveli to Shencottah line. Thiruvananthapuram is the nearest airport to this sanctuary at a distance of 140 kilometers. Madurai is yet another nearest airport situated about 200 kilometers from Kalakad. The reserved forest is transversed with three roads, Manimuthar to Upper Kodayar, Kalakad to Sengaltheri and Thirukarangudi to Nambikoil. This sanctuary spreads over the altitudes of 100m to 1775m.\(^ {41}\)


\(^ {40}\) Ibid., p.4.

\(^ {41}\) Ibid., pp.1-3.
The sanctuary is naturally endowed and gifted with a life-supporting system of perennial rivers and streamlets with copious supply of water to support the biomass of the region. The main life-supporting rivers in the sanctuary are Keelamanimuthar, Melamanimuthar, Kusanguliar, Pachayar, Nambiar, Kodumudiar and Kulirattiar. These rivers form the major source of water supply for the wildlife throughout the year. Besides, three artificial water holes were constructed in this sanctuary at needed wildlife points. Keelamanimuthar and Kusanguliar provide the water requirements of the lion-tailed macaque.\textsuperscript{42}

The variations of temperature, altitudes and rainfall with difference in slope and soil conditions make the sanctuary enjoy varying types of forests with varying intensities. The hills are steep with tropical dry deciduous forests on the lower slopes and tropical wet evergreen forests and shola forests on the upper reaches. The following are the important types of forests:\textsuperscript{43}

1A/C4-West Coast Tropical Evergreen Forests

2A/C3-Tirunelveli Semi Evergreen Forests

3B/C2-Southern Moist Mixed Deciduous Forests

4A/C1b-Dry Teak Forests

5A/C3-Southern Dry Mixed Deciduous Forests

8A/E1-Ochlandra Reed Brakes

These provide the niches for a variety of fauna. Lion-tailed macaque and Nilgiri langur consume buds, fruits and nuts of \textit{Palaguium ellipticum}, \textit{Cullonesa excelsa}, \textit{Durio rosatoryana} and \textit{Calophyllum elatum}. Heterotrophs such as elephant and gaur depend upon the eta reeds and seedlings and saplings of the species of the region.

\textsuperscript{42} \textit{Ibid.}, p.22.

Very many varieties of palatable grasses form the major food sources for the herbivores. Sambar feeds on the fruits of *Randia dumetorum*.44

The mountainous undulating topography is the characteristic feature of Kalakad sanctuary. Except the terrains near Thalayanai almost all the area lies in undulating hills not easily accessible by any kind of vehicles. The climate of this sanctuary on the outer fringe of the hills is generally hot and dry up to an elevation of about 500 meters. The maximum and minimum temperature in the plains is 750 Fahrenheit to 1100 Fahrenheit. But the hills are cooler and drier in summer and afford pleasant retreat during hot months. Kalakad sanctuary gets the benefit of both the south west and the north east monsoons. Average rainfall varies from 750mm in the eastern slopes to 3000 mm in the western high ranges.45

There are two prevailing winds which are noticed in the sanctuary. The south west monsoon is accompanied by the wind from the western side between June and August. The velocity of the wind is very high on the western aspect of the ghats. The impact of this wind on the eastern slopes is negligible. The north east monsoon is seldom accompanied by winds of high velocity. However, these actions of the wind on wild animals is negligible or practically nil.46

The lowest altitude is about 100 m in the eastern boundary of the sanctuary. The Kalakad peak with the elevation of 1775m is the highest one on the southern boundary. Other noteworthy peaks are the Vellimalai 1011m, Panjanthangimottai 1192m, Kakachi 1233m, Netterikkal 1350m, Kuliratti 1396m and Thiruvannamalai peak 1387m.47

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47 Ibid.
The land use has a direct bearing on wildlife. The land for agriculture, grow more food campaign, extensive rather than intensive cultivation and shifting cultivation are all very important to improve its economy. These varied land use patterns are in conflict with wildlife conservation. Formation of roads and hydro-electric schemes and projects are other disturbing factors for wildlife. Grazing results in soil erosion and spread out diseases to wildlife. So far as Kalakad sanctuary is concerned the land use did not suffer by the above-mentioned factors. On the other hand there were many conducive factors such as absence of shifting cultivation, hydro-electric projects and network of roads to wildlife. As such the wildlife of Kalakad sanctuary has a habitat undisturbed by any human agencies and adverse biotic factors.\(^48\)

The Kalakad sanctuary was formed primarily for the conservation of one of the rarest non-human primates and mammals of the world, namely the lion-tailed macaque. This unique primate is endemic to the western ghats. The major cause of depletion of the population of lion-tailed macaque was the destruction of its natural habitat due to plantation of tea, coffee and cardamom. Poaching was also another important factor responsible for its decline. The important factor for the conservation of the primate here is the availability of the primal evergreen forest over an extent of about 100 square kilometers where human interference is most minimal. In the efforts to conserve the lion-tailed macaque in these rain forests, all the other threatened mammals and birds and more particularly, flying squirrel, tiger, panther, Nilgiri langur, Nilgiri tahr, gaur, the great Indian hornbill, Malabar pied hornbill and Malabar trogon find a heaven of safety and undisturbed existence.\(^49\)

The lion-tailed macaques which live in family troops require an extensive area to meet their basic needs of living when compared to other primates. A Nilgiri langur which

\(^{48}\) Joseph Jogindranath, Management Plan, pp.71-72.

\(^{49}\) Ibid., p.49.
is folivorous need not move very much to find its food, whereas the omnivorous, lion-tailed macaque depends on varieties of food. Its variegated food structure necessitates movement over a wide area and the seasonal availability of food items makes it move far beyond. Thus its home range happens to be one of the largest among primates. It also needs a continuous arboreal path way without any gap. Any gap created by human beings by felling or erecting tower line or forming road will cut the macaques off from the isolated patches of flowering and fruit bearing trees. As they are accustomed to find food in different seasons in definite parts of their home range, any change in the flowing direction of the river by causing diversions or by constructing dams would grievously affect the welfare of the population. The population density has been estimated to be as three macaques per square kilometer. The total population is estimated to be 250 to 300 in 1978.50

Kalakad reserved forest bears many endemic fauna. In 1989, the Kalakad sanctuary had the following rare and threatened species, namely, lion-tailed macaque, tiger, slender loris, Nilgiri tahr, leopard, elephant, gaur, python, Malabar squirrel, flying squirrel, king cobra, mouse, deer, great Indian hornbill, spotted hyena, Malabar civet, pangolin and shrew. Poaching in the past and the annually recurring fire in its natural habitat had reduced these species to near extinction. The sambar is the most commonly and frequently seen deer in Kalakad sanctuary. In the past, uncontrolled poaching resulted in the depletion of its population. With complete control of poaching, the population of sambar has steadily increased. They are normally seen in the broken terrain characterised by the presence of thick under-growth. Since the sanctuary was closed for grazing the predators which depended on the cattle had turned to prey upon the sambars. As far as elephants are concerned, in the recent years, their population in the sanctuary is definitely on the increase as a result of the migration from the adjoining Kanyakumari district,

50 Ramanathan, Management Plan, p.41.
especially after the construction of the Upper Kodayar Hydro Electric project.\textsuperscript{51} Other animals found in the sanctuary are the panthers, wild dogs, mongoose, the pangolin, the civet cat, jungle cat, slender loris and rat.\textsuperscript{52}

The sanctuary is famous for the variety of birds found. Though there is a good population of over eighty eight species, the following birds are peculiar to the evergreen forests of Kalakad sanctuary. They are laughing thrush, mountain thrush, fairy blue bird, yellow backed sun bird, spider hunter, Malabar golden backed woodpecker, hot spotted woodpecker, Malabar great black woodpecker, Niligiri speckled puculet and blue-bearded bee eater. Egrets and herons are among the water birds. Jungle fowl, spur fowl, partridges and so on are the ground-lying birds. The Emerald dove, minivets, fairy blue bird and trogons are some of the bright coloured birds. Cuckoos, whistling thrush, hill myna are the singing birds. Drongos warblers, woodpeckers, orioles, fly catches are very much a part of the jungle scene. Several species of owls and night jars represent the birds of night.\textsuperscript{53}

Kalakad sanctuary is a paradise for the Herpetologists. It has its own peculiar and characteristic reptilian fauna. The leading local Herpetologist Dr. M.V. Rajendran states that “all the five kinds of pit vipers are present in Kalakad hills. The presence of rare and highly localised uropeltied snakes in Kalakad forest is a peculiarity to the sanctuary”. More important are the python, cobra, king cobra, black cobra, common krait, russels viper, dark pit viper, garden lizard and monitor lizard.\textsuperscript{54}

\textsuperscript{51} Ibid., pp.41-46.
\textsuperscript{52} Ibid., pp.46-47.
\textsuperscript{53} Ibid., p.48.
\textsuperscript{54} Pramod Kant, Reconnaissance Report: Kalakad Wildlife Sanctuary, pp.6-7.
Previous Planning Initiatives

The Kalakad forests were claimed by the Thirukarangudi mutt and though the Government overruled these pretences, the mutt carried the case to the High Court and final decision in favour of the Government was made in 1909. The entire Kalakad reserved forest was placed under the direct supervision of the Sub-Collector at Chermadevi and was placed in charge of a duffadar and three peons. This system proved to be defective as the revenue officers had no sufficient time for forest work and the jurisdiction of the special staff was too large for effective supervision. Therefore, the then Collector of Tirunelveli District, Puckle, who declared that the only remedy was to hand over the complete charge of the forests to the Special Department and this was done in 1886.\(^55\)

From 1891, the system of working areas on the principle of sustained yield was introduced. The following decade saw a regular state of working covering the greater part of the workable area of the forest. In 1897, H.B. Bryant prepared the Kalakad working circle. In 1902, P.M. Lushington prepared the Tirukarangudi and Nanguneri working circles. The main objects of the above plans were:

1) to define the areas to be strictly protected with a view to the preservation of water sources;

2) to regularise in a simple manner the exploitation of timber in the evergreen forests and the higher semi-deciduous forests;

3) to control grazing and

4) to supply the neighbouring population with small timber, fuel and charcoal on the principle of sustained yield.

The more accessible and exploitable evergreen and semi-deciduous forests were worked under selection felling method on a six-year felling cycle. The deciduous forests were worked under a modified ‘coppice with standard’ system. The serious defect of all these plans was that none of them provided for supplementing natural regeneration by artificial means wherever necessary. By 1915 the period of many of the working plans expired. During the period 1915 to 1930 departmental extraction of timber from evergreen and semi-evergreen forests was undertaken at a profit. There were selection working circle, grazing working circle and minor forest produce working circle. In the course of subsequent working plans many changes were made in the prescriptions of management practices and permitting contract agencies for exploitation. During 1943 to 1944 all works were carried out by the forest department for supplying wood material to defence service. Fellings were neither restricted to girth classes prescribed nor to the areas specified in the plan as the main consideration was to supply as much as possible for the defence services. The result was that very few trees were left after extraction and the forests badly needed rest.\(^5\)

S.A.Rahmatullah, in his working plan for the then Tirunelveli South Division suggested the felling of fuel in Kundur (4280 acres), Kilmanimuthar (4120 acres), Kolundumamalai (1370 acres), Padmaneri (1960 acres), Vadagarai (2140 acres), Kalakad (3530 acres), Malayadipudur (860 acres), Nambikoil (1800 acres), Thirukarangudi (1620

acres) and Parivarisurian (2160 acres).\(^{57}\) Owing to repeated working of the forests under the fuel working circle, the coppicing power of the predominantly occurring species was highly reduced and attempts to reclothe them by artificial regeneration was not successful.\(^{58}\) The result was that they contained poor growth and could not be sold. Kadakshamani, while revising the plan of Rahmatullah, proposed the Vadagarai and Kalakad felling series and rest to the other series. Since the declaration of Kalakad reserved forest as a sanctuary, the working of the above two felling series was not in operation in consistency with the policy of non-interference with the habitat of the sanctuary.\(^{59}\)

S. Ramanathan, Wildlife Warden, prepared the first management plan exclusively for Kalakad sanctuary. The Kalakad forest was hitherto managed taking into account of the forest aspects only. Kalakad sanctuary being the most ideal habitat not only for lion-tailed macaque but also for many of the rare, threatened, vulnerable and uncommon fauna and flora, the proposals were aimed at the conservation of these fauna and their habitat. The objects of managements were: \(^{60}\)

1) to conserve the highly endangered lion-tailed macaque together with its habitat and to maintain a viable population of them for scientific, aesthetic, cultural and ecological values;

2) to conserve the threatened carnivores such as tiger and panther;

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3) to improve the habitat by eliminating the disturbances caused by forest operations, cardamom cultivation, tea plantations and acquiring the private enclaves within the sanctuary;

4) to preserve and improve the population of other wild animals within the sanctuary along with their habitat;

5) to undertake systematic research on the binomial breeding pattern and migration of wild animals and inter-relationship of different species;

6) to improve the population of the Nilgiri tahr;

7) to undertake complete survey of the flora and fauna of this region;

8) to encourage wildlife tourism without causing disturbance to the wildlife;

9) to create awareness among the public about the importance of wildlife conservation through booklets, slides, films, pamphlets etc.;

10) to maintain healthy public relations with all users of natural resources;

11) to establish a herpetological garden in Nambikoil and to undertake research on the eco-physiology of Opheoidea;

12) to establish an Orchid garden at Sengaltheri and

13) to establish a museum and herbarium at Kalakad.

To achieve these objects, the sanctuary is divided into wilderness zone, buffer zone and tourism zone. The upper reaches of Kalakad sanctuary containing the tropical wet evergreen forests comprised the wilderness zone. No forestry operations were allowed within the zone. No permission should be given to the public works department
or to the Tamil Nadu electricity board or to any other Government agencies to undertake any investigation work within this core area of the sanctuary. The belt of wet evergreen forest and the rest of the sanctuary not included in the tourism zone formed the buffer zone. In the zone wildlife-oriented forestry operations would be planned. A small area near Thalayanai and Karungalkasam came under tourism zone.  

Regarding financial implications, Ramanathan estimated Rs.51,66,900 as non-recurring expenditure and Rs.3,43,964 as recurring expenditure annually. The non-recurring developmental activities within the sanctuary should be met with the financial assistance provided by the Government of India, while the State Government should meet the recurring expenditure. “Considering the overall benefits,” Ramanathan wrote, “the loss of revenue to the State is almost negligible as a result of suspension of the area working of the two fuel felling series and cancellation of all existing leases.”

It should be noted here that in the year 1978, thirty nine private estates fell within the boundaries of Kalakad Sanctuary. In the subsequent years many of the estates were not cared for and left to become wild and had merged and blended with reserved forests. In the interest of proper management of the sanctuary it was decided to acquire privates enclosures. Only four estates namely Kuliratti estate, Vanamamalai muttland, Narakadu and Jeer mutt claimed compensation and the authorities deposited an amount of five lakh rupees with the Collector of Tirunelveli district. Again, sixteen cardamom blocks were leased out to private individuals in the years 1963 and 1970 with a lease period of

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61 Ibid., pp.61-63.
twenty five years over a total area of 98.36 hectare. The annual rental was Rs.250 per hectare. This was the only disturbance to the habitat of lion-tailed macaque. In order to minimise the human disturbances arising out of labour settlements in the cardamom lease, the Government decided not to extend the lease period. Nine blocks had already been surrendered to the department. The lease period of four blocks of forty hectares was over in 1988 and the rest in 1995.\(^{64}\) As there was no tribal settlement within the sanctuary, disturbance to the wildlife and its habitat was negligible.\(^{65}\)

**Minor Forest Produce Collection Lease**

Tamarind, honey, palmyrah and fruits were the main minor forest produce of this division. The division was divided into five units and it was leased out to public. The revenue realised was:

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978 - 79</td>
<td>Rs. 9,141.00</td>
</tr>
<tr>
<td>1979 - 80</td>
<td>Rs. 13,652.00</td>
</tr>
<tr>
<td>1980 - 81</td>
<td>Rs. 21,285.00</td>
</tr>
</tbody>
</table>

The revenue obtained from minor forest produce was negligible but the labour engaged for the collection inevitably disturbed wildlife. They were also responsible for a lot of felling of branches. Therefore, it was stopped in 1976. Hence, the revenue realised through minor forest produce collection was sacrificed for the sake of wildlife. In 1989 Joseph Jogindranath wrote, “there are still clandestine removal of fuel by villagers and other forest offenders from villages adjacent to Thirukarangudi. They illegally enter and remove minor forest produce like white damer, black damer, lavangam bark, cane and

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tamarind. This should be stopped forthwith by tightening the protection by deploying the proposed flying squad.\.66

Grazing was completely stopped in Kalakad sanctuary even from the year 1976. But some grazing was allowed in other reserved forests of the division and earned average revenue of Rs.1400 per year. Since it was found that there was a possibility of wild animals to come to these forests or the cattle to enter the Kalakad reserve forest, grazing was completely stopped from 1984 and this revenue was also sacrificed for the sake of wildlife in the sanctuary.\.67

Poaching

As far as Kalakad sanctuary is concerned, shooting animals with gun was very rare. For offences were booked for poaching prior to its declaration as a sanctuary, relating to hunting of animal with hounds.\.68

**Particulars of poaching offence in Kalakad reserved forest from 1973 to 1975**

<table>
<thead>
<tr>
<th>Description</th>
<th>Place where Killed</th>
<th>Date</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sambar (male)</td>
<td>--- do ---</td>
<td>18.11.1974</td>
<td>Compounded</td>
</tr>
<tr>
<td>Sambar (male)</td>
<td>--- do ---</td>
<td>20.04.1975</td>
<td>Prosecuted; fined</td>
</tr>
<tr>
<td>Sambar (calf)</td>
<td>--- do ---</td>
<td>29.06.1975</td>
<td>Compounded</td>
</tr>
<tr>
<td>Sambar (female)</td>
<td>--- do ---</td>
<td>02.11.1975</td>
<td>Compounded</td>
</tr>
<tr>
<td>Sambar (female)</td>
<td>--- do ---</td>
<td>17.11.1975</td>
<td>Compounded</td>
</tr>
</tbody>
</table>


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66 Joseph Jogindranath, Management Plan, p.109; Ramanathan, Management Plan, p.53; S.Viswanathan, Kalakad Wildlife Sanctuary at a Glance (Presented to Dr.W.A.Rodgers and Members of the Evaluation Committee During their visit to Kalakad Wildlife Sanctuary of Tamil Nadu on 5, 6, 7 and 8 May 1986) (Tirunelveli, 1986), p.17.

67 Ramanathan, Management Plan, pp.8 and 17.

68 Ibid., p.51.
<table>
<thead>
<tr>
<th>Serial Number</th>
<th>Description</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Sambar (Female)</td>
<td>18.11.73</td>
</tr>
<tr>
<td>2.</td>
<td>Sambar (Calf)</td>
<td>08.12.73</td>
</tr>
<tr>
<td>3.</td>
<td>Sambar (Calf)</td>
<td>29.01.74</td>
</tr>
<tr>
<td>4.</td>
<td>Sambar (Female)</td>
<td>01.10.74</td>
</tr>
<tr>
<td>5.</td>
<td>Sambar (Male)</td>
<td>10.12.74</td>
</tr>
<tr>
<td>6.</td>
<td>Sambar (Calf)</td>
<td>30.01.75</td>
</tr>
<tr>
<td>7.</td>
<td>Sambar (Calf)</td>
<td>13.03.75</td>
</tr>
<tr>
<td>8.</td>
<td>Sambar (Calf)</td>
<td>29.06.75</td>
</tr>
<tr>
<td>9.</td>
<td>Sambar (Calf)</td>
<td>29.06.75</td>
</tr>
<tr>
<td>10.</td>
<td>Sambar (Female)</td>
<td>30.06.75</td>
</tr>
<tr>
<td>11.</td>
<td>Sambar (Female)</td>
<td>28.08.75</td>
</tr>
<tr>
<td>12.</td>
<td>Sambar (Calf)</td>
<td>31.12.75</td>
</tr>
<tr>
<td>13.</td>
<td>Sambar (Male)</td>
<td>27.01.76</td>
</tr>
<tr>
<td>14.</td>
<td>Sambar (Calf)</td>
<td>17.03.76</td>
</tr>
<tr>
<td>15.</td>
<td>Sambar (Calf)</td>
<td>18.11.76</td>
</tr>
<tr>
<td>16.</td>
<td>Sambar (Male)</td>
<td>28.01.77</td>
</tr>
<tr>
<td>17.</td>
<td>Sambar (Male)</td>
<td>19.02.77</td>
</tr>
<tr>
<td>18.</td>
<td>Sambar (Male)</td>
<td>01.03.77</td>
</tr>
<tr>
<td>19.</td>
<td>Sambar (Male)</td>
<td>22.07.77</td>
</tr>
<tr>
<td>20.</td>
<td>Sambar (Calf)</td>
<td>04.08.77</td>
</tr>
<tr>
<td>21.</td>
<td>Sambar (Calf)</td>
<td>05.08.77</td>
</tr>
<tr>
<td>22.</td>
<td>Sambar (Female)</td>
<td>August 77</td>
</tr>
<tr>
<td>23.</td>
<td>Sambar (Female)</td>
<td>August 77</td>
</tr>
<tr>
<td>24.</td>
<td>Sambar (Calf)</td>
<td>14.09.77</td>
</tr>
<tr>
<td>25.</td>
<td>Sambar (Calf)</td>
<td>28.09.77</td>
</tr>
</tbody>
</table>

In 1978, Ramanathan suggested the organisation of an efficient network of protective staff for enforcing protection of wild animals against poaching. The staff should be provided with weapons for efficient protection. Dogs straying into the sanctuary had to be shot down as the villagers around resort to the subtle method of driving their dogs into the sanctuary which in turn chase sambar outside the sanctuary where they would be killed by the waiting poachers. 69 Joseph Jogindranath in his management plan for Kalakad sanctuary for the years from 1989-90 to 1998-99 stated that “at present there is no separate flying squad. An anti-poaching squad is a must who will also protect the habitat from tree cutting.” Further he pointed out that “there is much communication gap whenever information on illicit felling, poaching and other clandestine activities take place. In addition, whenever forest fire occurred the communication had to reach by roadway to the authorities concerned. These delays caused more damage to the forest. Therefore wireless, walkie-talkie as well as network of telephone links will have to be established to enforce fire fighting operations and prevent tree felling and poaching. 70

The first plan officer Ramanathan suggested the appointment of one Forester, two Forest Guards and two reserve watchers for making surprise raids to prevent poaching and forest fires. Besides, he proposed the establishment of check posts, one at Nambiar site and another at Sivanaperi. He also proposed to supply arms and ammunition to protective staff. He also emphasised that the existing provision regarding payment of cash awards should be used liberally to get information about poaching and other offences relating to wildlife. 71

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69 Ibid., p.63.

70 Joseph Jogindranath, Management Plan, p.106.

71 Ramanathan, Management Plan, p.70.
Rigid protection, strict enforcement of Wildlife (Protection) Act 1972 and repeated patrolling had controlled poaching very much. While fifteen cases were detected in 1979, it was ten in 1980, six in 1981, two in 1983-84 and none in 1984-85 and 1985-86.\textsuperscript{72} It proves that poaching had been controlled rigidly. But Pramod Kant in his Reconnaissance Report (1987-1997) wrote that “the main problem they (Nilgiri tahr) face is poaching. Stricter anti-poaching and informant system will be proposed for the conservation of this species”.\textsuperscript{73}

The decline in the population of panthers and the tigers within the sanctuary was due to pesticide poisoning. By closing the sanctuary for grazing, the folli dol poisoning was completely eliminated. To control the damage to the cultivated crops adjoining the sanctuary by the wild boars, the ryots used to kill the animals by the use of country made grenades. Seeing the stringent action meted out to these offenders, this sort of killing the wild boars was minimised to a great extent.\textsuperscript{74}

**Fire protection**

In the olden days, fire was very common between March and September. The eastern slopes of the sanctuary usually get very scanty amount of rainfall since it is a rain shadow region. Hence the moisture content was very poor which was responsible for repeated fires in this area. But fire had never penetrated deep into the moist evergreen shola forests. Generally they were ground fires, not causing much damage to the existing trees. The fires were controlled to the maximum extent by cutting and clearing the fire lines and employment of fire watchers. Nature does not play a part in originating the forest fire in this sanctuary. Mostly the fire originated from the minor forest produce

\textsuperscript{72} Viswanathan, Kalakad Wildlife Sanctuary At a Glance, p.17.

\textsuperscript{73} Pramod Kant, Reconnaissance Report, p.16.

\textsuperscript{74} Ramanathan, Management Plan, pp.50-51.
collectors and graziers. The sanctuary stopped minor forest produce collection and grazing. Again, the sanctuary authorities constructed six watch towers during the year 1985-86. There were some fires in the past years but the area affected was negligible. In the 1990s, in order to protect the habitat from destruction of fire, it was proposed to employ, on daily wages, two teams of six fire fighters. Training in fire protection measures was given to all the staff in the sanctuary. All Rangers and Foresters were sent to the Kerala Forest Fire Protection Centre for training.

**Tiger Reserve**

It should be noted here that the Government established the Kalakad-Mundanthurai Tiger Reserve in 1988. The reserve, comprising two adjacent wildlife sanctuaries, viz. the Kalakad Wildlife Sanctuary and the Mundanthurai Wildlife Sanctuary, located at the southern end of the western ghats in the districts of Tirunelveli and Kanyakumari. The major contribution of 817.72 square kilometers belongs to Tirunelveli district and the rest of 77.28 square kilometers distributed in the Veerapuli and Kilamalai reserve forests, belongs to Kanyakumari district. It lies between latitudes 80°20' and 80°53' north and between longitudes 77°10' and 77°35' east. It is bounded by Ambasamudram and Tenkasi taluks of Tirunelveli district in the north, Ambasamudram and Nanguneri taluks of Tirunelveli district in the east, Kanyakumari district in the south and Kerala State to the length of 287.61 kilometers in the west. The reserve falls under Biogeographical provinces and extends over 895 square kilometers amidst pristine tropical forests.

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75 Ibid., pp.22-23.
76 Pramod Kant, Reconnaissance Report, pp.18-19.
Joseph Jogindranath prepared the management plan for Kalakad sanctuary for the period from 1989-90 to 1998-99. It envisaged the fulfillment of the objectives in a phased programme taking into account the formation of Kalakad Wildlife Sanctuary and Mundanthurai Wildlife Sanctuary into a contiguous area to be managed in future under ‘Project Tiger’ from 1989-90 onwards. Therefore, the prescription of the plan had a dual role in maintaining the identity of Kalakad Wildlife Sanctuary and its management for the target species lion-tailed macaque on the one hand and the preservation of tiger in its natural habitat on the other hand. With these considerations the author proposed the following objectives:  

1) to ensure preservation through wise use;  
2) to ensure the perpetuation of lion-tailed macaque;  
3) to ensure the perpetuation of species like tiger and others native to Kalakad forest;  
4) to maintain the optimal habitat conditions for lion-tailed macaque and tiger and their niches;  
5) to locate the areas of benefits and conflicts of human influence for objectives, foster the benefits and control the conflict and  
6) research in animal distribution with reference to habitat, niche, faunal ecology, migration and faunal behavioral studies and effect and impact of artifacts inside the sanctuary on wildlife.

The financial implications for the total plan period of ten years was Rs.494.64 lakhs. 

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78 Joseph Jogindranath, Management Plan, pp.87-88.

79 Ibid., pp.85 and 157-225.
It should be noted that the Government of India stressed the need for appointment of honorary Wildlife Wardens in the State so as to involve public participation in the conservation of forest and protection of wildlife. Based on the suggestion, the Government of Tamil Nadu appointed K.S.Raman as secretary of Tirunelveli District Wildlife Association and K.Shanmuganathan as Additional Chief Conservator of Forest-cum-Chief Warden for Kalakad Sanctuary in 1985.80 Besides, a committee headed by the Chief Wildlife Warden was appointed for monitoring the sanctuary management and execution of plan works. The Deputy Director (Wildlife) Southern Zone and two eminent naturalists appointed by Chief Wildlife Warden were the other members of this committee. The committee would meet once in six months. It would gauge the performance on the achievements of physical targets in the plan works, particularly habitat improvement works.81

Tourism : Places of Cultural Significance in and around the Kalakad-Mundanthurai Tiger Reserve82

Tourism is one of the aspects of the forest administration in Kalakad-Mundanthurai Tiger Reserve. The forest department puts up advertisements to attract the public to visit places of tourist interest in the forest region.

Arulmigu Papavinasam Temple

The temple and place are locally known as meaning attainment of forgiveness of all sins. This is one of the venerated temples of Tamil Nadu which was built in the

80 Pramod Kant, Reconnaissance Report, p.22.
81 Doraisamy, Management Plan, pp.61-62.
sixteenth century. It is situated on the way to the Mundanthurai tiger sanctuary about ten kilometer from Ambasamudram.

**Arulmigu Agasthiar Temple**

According to legend, sage Agasthiar was sent to the south by Lord Siva to balance the south, which was tilted up due to concentration of all seers and sages in the Himalayas at the time of the holy matrimony of Siva with Parvathy. There is a waterfall known as Agastiar falls.

**Arulmigu Chorimuthaiyanar Temple**

The temple is dedicated to Sastha and situated in the midst of forests. During Adi-Amavasai large number of pilgrims congregate in this place.

**Arulmigu Sivasailam Temple**

This is one of the oldest and venerated temples of Tamil Nadu. The presiding deity is Lord Siva. Unlike other temples the deity and the temple are facing the west.

**Arulmigu Murugan Temple at Thoranamalai**

This is a temple on the top of a hillock close to the sanctuary near Kadayam. There is a fresh water spring behind the temple and pilgrims visit the temple throughout the year.

**Banatheertham**

Banatheertham is the place where the river Tambirabarani falls into the Hope Lake. Taking bath in the water falls and offering “Tharpanam” to the departed souls are done on the day of Adi-Amavasai. The water falls can be reached by boat.
Nambikoil

Nambikoil in Kalakad sanctuary is situated about eight kilometers away from Thirukarangudi. It is a famous pilgrim spot to the Hindus especially Vaishnavites. Vaishnavites venerate this temple considering the deity as important as Lord Venkateshwar at Thirupathi. Every Saturday a large number of pilgrims from different parts of Tirunelveli district visit this spot. Another important temple in the sanctuary is the Karumandiamman Koil very near the Singalam Illam at Sengaltheri. There are many other temples for different deities in the sanctuary.

Historically important centres are the Pandian Fort, Kottai Madam, Kottamthalam and Tharuvattamparai. The Pandian Fort is situated at a walking distance of five kilometer from the Hope Lake. The Fort is said to have been built during the sixteenth century and is located on the top of a hill. The wall of the fort had been constructed by using very huge granite stones. It is an amazing sight.

About wildlife tourism, Mangalaraj Johnson wrote “wildlife viewing in India can never be in the African pattern where prides of lions, hundreds of elephants and thousands of deer and antelopes could be viewed closely on a vehicle safari…what we can sell in this sanctuary to the tourists is the peace and tranquility of the tropical forests, their silence punctuated by animal calls, enchanting bird music and the ever-changing panorama of natural beauties.”

In order to get the opinion of the public on their interest in wildlife tourism in Mundanthurai sanctuary, a questionnaire was circulated in Madurai, Tirunelveli, Ramanathapuram and Kanyakumari districts in 1978. The answers indicated that there were demands for one to two days week-end tourism from lower and low-middle income

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83 Mangalaraj Johnson, Management Plan, p.203.
groups, who would be ready to spend fifty rupees for the trip. Again there were about 300 officers in the Harvey Mills, who were getting attractive monthly income. Besides, engineers working in Servalar, Lower camp and Upper dam and their guests, officers, teachers working in Ambasamudram and other nearby small towns would visit the sanctuary. So it was estimated that on week-end alone, there would be a definite inflow of 100-500 visitors a day. Based on the assumption, Mangalaraj Johnson prepared a plan for the period 1978 to 1988.\textsuperscript{84}

The next plan officer Doraisamy wrote in 1989 that there is an increasing public demand for the use of forests as outdoor recreation ground for camping and picnic. The visitors in Mundanthurai sanctuary are classified as pilgrims, picnic spots lovers, nature lovers, wildlife lovers and researchers and educationists. The yearly collection from the tourists by way of entrance fee was around Rs.50,000 in 1989.\textsuperscript{85}

In Kalakad, before the emergence of the perennial Pachayar river from the reserved forest into the private patta lands, the river forms a picturesque spot known as Thalaianai. Lofty evergreen trees such as naval, nangu, kongu and marudu flank the river on both sides. The musical splashing of water against the huge boulders is enchanting. People around the sanctuary congregate around the place just to spend the week-end. Another picturesque spot in the sanctuary is the Netterikal falls.

Almost all parts of the sanctuary were not easily approachable as a result of rugged and undulating topography. As a result, the influx of tourists into the sanctuary was negligible. Ramanathan wrote, “because of these conditions, conservation of wild animals and other habitats plays a dominant role over tourism”. He further wrote,

\textsuperscript{84} Ibid., pp.205-213.

\textsuperscript{85} Doraisamy, Management Plan, p.65.
“if adequate tourist arrangements and amenities are provided, tourism can be promoted to a great extent. Facilities to view wildlife at present are lacking.”

The only habitable rest house within the sanctuary is the “Singalan Illam” at Sengaltheri. Here, only the persons connected with wildlife research and management were allowed to stay. So, necessary accommodation facilities should be provided in the tourism zone. Ramanathan suggested the construction of tourist lodges in Mudaliruppan and Nambikoil. In these places, tented accommodation might be arranged in view of the fact that most of the tourists wish to enjoy a real safari experience. He also suggested the construction of one dormitory at Mudaliruppan to cater to the groups like students and others who preferred inexpensive boarding and lodging. He also suggested the improvement of Karungalkasam in Malayadipudur beat where there is a picturesque waterfall forms a tourist place. One rest shed should be constructed at this site which was essential for promoting tourism.

For promoting tourism the following facilities were to be provided in a phased manner:

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<tr>
<td>Construction of tourist lodge at Mudaliruppan and Nambikoil</td>
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<tr>
<td>Construction of a rest shed at Karungalkasam</td>
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<td>Providing hides advantage points for viewing wild animals</td>
<td>1000 every year</td>
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<td>Providing watch towers</td>
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<td>Dormitory at Mudaliruppan</td>
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86 Ramanathan, Management Plan, pp.9-10, 62 and 78.

87 Ibid., pp.78, 79 and 80.
In 1989, there were rest houses, inspection sheds, forest huts and log houses at Sengaltheri, Kakachi, Mudaliruppan and Thalayanai. Watch towers for tourists are available at Thalayanai, Karungalkasam, Koovapatti and Kakachi. Machan and hideouts suitably camouflaged at ideal selected sites along water holes, corridors and vista lines and edges to enable the tourists to view wildlife.\footnote{Joseph Jogindranath, \textit{Management Plan}, p.67.}

For tourists the following tracks had been formed and maintained:\footnote{\textit{Ibid.}, pp.67-68.}

1. Kalakad to Thalayanai \hspace{2cm} 5.5 kilometers
2. Thalayanai to Karungalkasam \hspace{2cm} 6.0 kilometers
3. Karungalkasam to Mudaliruppan \hspace{2cm} 7.5 kilometers
4. Mudaliruppan to Muthalar Cross Road \hspace{2cm} 9.2 kilometers
5. Muthalar to Moolakasam \hspace{2cm} 7.0 kilometers
6. Moolakasam to Kakachi \hspace{2cm} 15 kilometers
7. Kakachi to Sengaltheri \hspace{2cm} 14 kilometers
8. Sengaltheri to Netterikal \hspace{2cm} 14 kilometers
9. Netterikal to Narakadu \hspace{2cm} 8 kilometers
10. Narakadu to Nambikoil \hspace{2cm} 14 kilometers

The tourists here are selective because there are only forests and fauna to entertain them. There are some other visitors who visit temples at Nambikoil and Karumandiamman Koil, who are pilgrims and worshippers. There is yet another set of people who come all the way to take bath in Pachayar, Nambiar and Kodumudi. Between 1985 and 1988, Rs.79,877.70 was collected as rest house rent and entrance fee.\footnote{\textit{Ibid.}, p.68.}

A number of visitors visited the sanctuaries and a sum of Rs.35,963 was collected as
revenue from tourism in 1981-82. The amount rose to Rs.102845 in 1985-86 and further rose to Rs.928945 in 2004-05.

**ECO DEVELOPMENT**

The forests of Kalakad-Mundanthurai Tiger Reserve had been subjected to a lot of degradation mainly by human interference. The degradation was due to an acute conflict between the needs of the people living near the forests and demands for preserving the forests. Most of the people living in the vicinity of the forests were “from poor and downtrodden” sections of the society. They used to go to the forests to collect firewood, fodder, timber and minor forest produce and earned a livelihood by selling them to others. An estimated 3215 head loaders felled fuel wood on a daily basis from the reserved forests. Hundreds of others used to come to the forests regularly to collect firewood. Likewise some 22100 cattle coming from neighboring villages grazed in the area. This had produced a degraded habitat for wildlife with poor cover and low quality forage. Constant human movement also was a hindrance to predating carnivores. Beside this, competition for available fodder in the ground vegetation by cattle was adversely affecting the herbivore prey base. Conflict within the local people due to crop-raiding wild animals was also a problem.

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92 Administration Report of the Tamil Nadu Forest Department for the Year 1985-86 (Madras, 1987), p.84.

93 Records kept preserved in the office of Deputy Director, Kalakad Mundanthurai Project Tiger, Ambasamudram.


95 Annamalai, *Eco Development*, pp.41, 49 and 50.
Even though penal provisions under various Acts exist, they had not been found to be effective in eliminating the biotic interference completely. When the authorities of the Reserve implemented the “policy of strict protection,” it resulted in great hostility between them and the local population. It is, therefore, thought that if the basic needs of the people living near the forests were met, the major cause of the destruction of forests would be removed. That would allow the forests to grow in an ideal manner. A survey was conducted in twenty villages situated near Kalakad Wildlife Sanctuary in the early 1990s. The survey found that firewood was the main source of energy for villages and the total requirement of the people was 30951 tonnes per year. The villagers were in a position to arrange one third of their energy requirement from agricultural waste, cowdung and so on. But for their remaining energy needs, they depended mainly upon the nearby forests.\(^96\) This excessive removal of firewood was the single largest factor for the degradation of forests.

Again, the reserved forests served as the grazing grounds for the local cattle. The data collected from the twenty villages, showed that the fodder requirement was about 2.28 lakh tonnes per year. The villagers were in a position to supply about 0.66 lakh tones of fodder per year from their resources like agricultural waste. But for the remaining 1.62 lakh tonnes of fodder, they mainly depended upon the nearby forests. This excessive grazing was one of the major causes for the degradation of forest. Browsing by goats was especially harmful to the development of forests.\(^97\)

Again, the survey found that the total requirement of timber for the people living in twenty villages situated near Kalakad Sanctuary was about 300 cubic meters per year.


\(^97\) Ibid., p.26.
This timber was required for construction of houses, household furniture as well as for agricultural implements. The villagers were able to manage 150 cubic meters timber requirements from their resources and for the remaining 150 cubic meters timber, they were depending on the forests. Non-availability of safe drinking water, veterinary care and non-awareness of nature conservation were the other problems of the people.\(^98\)

Considering the problems, an action plan for Eco Development over a period of five years was initiated in Kalakad-Mundanthurai Tiger Reserve with an outlay of Rs.118.24 million in 1994. This was a five-year project (1994 -1999). The project document defined eco development as a strategy for protecting ecologically valuable areas from unsustainable or otherwise unacceptable pressures resulting from the needs and actions of people living in and around such areas. The main objectives of the Eco Development Scheme were:\(^99\)

1) improvement of forests and wildlife by enlisting the cooperation of people living near the forests;

2) to generate employment potential by forestry related operations, for the benefit of people living near the forests;

3) to meet the basic needs of people living near the forests and thereby improving the quality of their life and

4) to motivate and educate the people living near the forests to become friends of forests.

\(^98\) Ibid., pp. 33-35.

The Eco Development initiatives reached out to the poorest of the poor and made profound changes in the livelihood pattern as well as lifestyle of the villagers in the boundary of the reserve. This was mainly by creating alternative income generating opportunities to those depending upon the forest produce for their daily bread. Many biomass generating assets such as roadside plantations, fodder plots and firewood sale depots got established. Beside this, the usage of fuel wood from forest was drastically altered by switching over to kerosene stoves and LPG.\textsuperscript{100}

There were 182 Village Forest Committees covering 29,064 families. The Government of Tamil Nadu took an initiative of financially empowering the village forest committees to receive and manage their funds directly.\textsuperscript{101} The Government representative in the village forest committee is the Forester who acts as a member secretary. With an average investment of one and a half to two lakh rupees for each village forest committee the total amount released to 182 committees was Rs.3.94 crores. The fund was managed in a revolving fashion which means that members who borrowed money from the village forest committee account had to return it at twelve per cent interest. This return along with a monthly membership fee of one rupee per month, added to the village forest committee’s bank balance. It was a measure of phenomenal success that the initial collective investment had grown to Rs.10.98 crores in seven years. The recovery of the loan was more than eighty per cent in eighty per cent of villages. In real terms some ninety six per cent head loaders left their illicit trade and converted as shopkeepers, wigmakers, dairy keepers and so on.\textsuperscript{102}

\textsuperscript{100} Ibid., pp.41-42.
\textsuperscript{101} G.O.No.288, Environment and Forests, 19 Nov. 1996.
\textsuperscript{102} Annamalai, \textit{Eco Development}, p.42.
To conclude, Kalakad-Mundanthurai Tiger Reserve forms the most ideal habitat not only for the lion-tailed macaque and tiger but also for many of the rare, threatened, vulnerable and uncommon fauna and flora. Man has interfered with the ecological balance in several ways. Clearing of forests and indiscriminate hunting of wild animals had resulted in the extinction of some species. This has led to the realisation that the conservation of wildlife is important to preserve it for the future. The Government, therefore, decided to conserve wildlife and established Mundanthurai Sanctuary in 1962 and the Kalakad Sanctuary in 1976. The twin sanctuaries were declared as a Tiger Reserve in 1988. At present, Tirunelveli district occupies an enviable position in its wildlife conservation. The Tiger Reserve represents one of the least disturbed and relatively little damaged ecosystems in the south.