AGRICULTURAL, HORTICULTURAL AND POWER GENERATION
Chapter VI

AGRICULTURE, HORTICULTURE AND
POWER GENERATION

The Britishers chose to colonise the plateau. So it was but natural for them to introduce their own way of cultivation in the hills where European agriculture and horticulture flourished, took deep root and bore fruits. The very face of the plateau was changed by new plants - commercial and ornamental, which were further improved by farmers by their innovative agriculture and horticulture.

Condition of Agriculture Before the British Period

The Todas never indulged in agriculture. The patch cultivation of the Kotas and the shifting cultivation of the Badagas were based on circumstances. They became self-sufficient in food - grains by their inter-relations.

All the inhabitants of the Nilgiris used wild pepper, and other edible wild edible roots in their diet. The main occupation of the Badagas was agriculture. They grew millets (Korali, samai, and
ragi) for their main food and amaranthus and fenugreek as greens and vegetables.

The Britishers introduced, implements, irrigation system, commercial and economic plant in agriculture in the Nilgiris. Terracing the slopes and preparation of lands were their scientific innovations in the hills. Cattle drawn ploughs and other such implements were improved. Commercial and economic plants suitable to the Nilgiri soil were identified and brought from various parts of India and the world.

Initial Steps

The era of green revolution was set in motion with the advent of sullivan's party, qualified by the French naturalist, M.Leshenaultdela. He took an expedition to the hills in May 1819. He was the first Botanist to visit the hills. He was instrumental in initiating Sullivan to develop gardening and farming in the Nilgiris. Through a letter dated July 5, 1819 written from Pondicherry, he planted the idea in the mind of Sullivan to develop the Nilgiris for European living and farming. Leshenault identified many wild plants of the hills for the first time, and the Moly Leaned Berberry was named after him as Mahonia Leshenault.

Sullivan's contribution to the Green Revolution

Sullivan established gardens around his Dimmatty
Bungalow and the stonehouse in Ootacamund. The experimental farms in South Downs and Ketti were setup on his initiative. The Royal Oak tree was planted by him in 1823.

In 1820 he started a garden of his own. He encouraged the cultivation of different kinds of vegetables by the distribution of good seeds from England to the British settlers, and to the local people as well. These new vegetables flooded the market for sale. Such temperate vegetables as beans, cabbage, cauliflower and carrot were called the "English Vegetables" or "European Vegetables".

Cultivation

The cultivation of vegetables became popular among the indigenous agriculturists around the towns. Later it spread to Coonoor, Kotagiri and Wellington. The French dwarf beans took root in the villages of the Nilgiris. It was harvested sooner than any other kinds, and which is even today popularly grown by the villagers for their consumption.

Horticultural and Vegetable gardens

Dimmatty Garden

John Jones, the then Medical Officer, Coimbatore, reported in his letter dated July 7, 1821, that the
garden was of great utility value with the European Vegetables attaining high degree of perfection. European fruits like strawberries, peaches, and apples were tried in Sullivan's garden at Dimmatti.

Stone House Garden

On completion of the stonehouse Sullivan raised an ornamental garden at Ootacamund from 1827 to 1834. This garden later on came under the control of the Government and the superintendent of Government Botanical Gardens carried experiments on exotic variety of trees there.

Experimental Farms

Bishop Downs farm

Success in raising gardens with exotic plants encouraged Sullivan to take up large scale cultivation. He wrote to the Government expressing his desire to make experiments on agriculture and requested the Government to sanction land for the same. He enclosed about 200 acres in the hill then known as South Downs (the present Bishop Downs). With due permission from Government, a farm was established with the services of professional European gardeners. Seeds and Saplings were brought from Europe, Persia, and other parts of the world.
S.R. Lushington's Farm, Ketti

As per the minutes of the Governor, Right Honourable Stephen Rumbold Lushington, the horticultural and agricultural experimental farm was set up in Ketti in April 9, 1830 and was called Lushington's Farm.8

Ploughs and farm tools were brought by orders from the Arsenal in Madras. Artillery horses were demanded to work the imported heavy ploughs.9 Cattle for both dairy and draft purposes were to be brought from the plains. Experiments commenced under the superintendence of Major Crewe in April 193110. When the English ploughs began to break the land, the potatoes, wheat and Oats started shooting out from the virgin soil. But the Directors refused to approve the scheme. So the farm was to be abandoned in 1836 for the returns proved far less than what was anticipated.

Government Botanical Gardens, Ootacamund

The garden which looks now more ornamental and entertaining has been an utilitarian and an experimental nursery for many plants both indigenous and exotic.

The European residents of Ootacamund formed this as a subscribers' kitchen garden in 184511.
The Government revived the garden in 1847 and maintained it with liberal grant and the Governor himself contributed Rs.1000/-\textsuperscript{12}. The Nilgiri Agro Horticultural Society which was formed in 1869, also joined in patronising the garden\textsuperscript{13}. The Directors sent W.G. McIvor, a scientific and practical gardener who had been well trained at Royal Kew Gardens, London\textsuperscript{14}. He took charge in 1848 as Superintendent of Ootacamund Garden and made every experiment a success\textsuperscript{15}. With the monthly Government grant of Rs.100/- with the support of the Garden Committee he promoted the primitive jungle into a beautiful public garden which is now considered as one of the most beautiful gardens in India. The swamps became streams of water. The ornamental ponds with wild growths were turned into grassy slopes and beds of flowers. Nurseries of vegetable, fruit and ornamental trees were created.

Achievements of the Garden

McIvor, on his own initiative, made many pioneering experiments on growing European Vegetable seed and tree saplings. He sent samples to the Garden of Horticultural society, London for test. The results from London motivated him to produce seeds and distribute them to the native farmers\textsuperscript{16}. Exhibition of vegetables, fruits and flowers was proposed in 1857\textsuperscript{17}. It led to the famous 'Flower show' which became an annual feature through which maintenance of ornamental horticultural gardens and growing good varieties of vegetable were encouraged on a competitive
spirit. The agricultural and horticultural products of the botanical garden and farms were displayed in the Dasara Festival of Mysore. The Madras Exhibition on Industry and Arts held between December 1903 and January 1904 also had notable displays of farm tools, blue gum oil, rubber, medicinal drugs, lemongrass oil and flowers from the Nilgiris. The Government increased the allowance despite the deficit that occurred every year. The objective of the project was to promote research in matters of botany and cultivation. For the benefit of the public, a seed house, a herbarium and a library were maintained in the Garden.

The Blue gum or Eucalyptus trees and wattle trees were introduced from Australia in 1864; gyranium argenitum or pampars grass from New Zealand in 1868; and Cinchona (calisaya) from South America in 1860 to the Nilgiris. The experiments on these varieties in the Garden proved successful.

In June 1883 Mr. M. Lawson, a new director took charge of the government botanical parks and gardens. He was the late professor of Botany in the University of Oxford. During his term, work was completed near the Government House. Several herbariums were added by the Government and also several books were presented to the library.

The first conservatory was built in 1856, ornamental ponds were made between 1864 to 1867.
Between 1911 and 1918 successful attempts were made to grow potatoes of both English and Indian varieties. From 1917 to 1923 the cultivation of medicinal plants which had hitherto been confined only to a few varieties like Jalap, common mint, lavender, rosemary, cloves, nutmegs and digitalis came to include no less than 21 drug varieties at the instance of the surgeon General.

From 1923 onwards specimens of drug plants were grown in the gardens merely for educational purposes.

The Management of the Garden

A gardener was first appointed in 1848, under a large committee consisting of the originators of the scheme. Then in 1853 the same scheme came under the control of a smaller body consisting of the Collector, the officer commanding Ootacamund and the Senior Medical Officer. It subsequently was put under the conservator of Forests in 1857. In 1896 he was designated curator and placed under the sole control of the collector, and in 1920 he was brought under the Agricultural Department under which he still continues.

Sim's Park

The Sim's park was laid in Dec. 1874 by two gentlemen Honourable J.D.Sim C.S.I. Secretary to the government and Major Murray, acting Superintendent of the Nilgiris. J.D. Sim's property was located in
a beautiful small valley on the north upper Coonoor and it was found fit for experiments of certain species which could not thrive in Ootacamund. So his property was taken over by the Government and was named after him. A pomological station was opened in 1920 which functioned under the curator of the park until 1941 and was put under the control of the fruit specialist thereafter.

Sim's park is divided into 8 major sections, the natural shola with its winding footpaths in the upper section of the park is very impressive. Seasonal tree specimens were planted in a scattered fashion at different sections of the Park. The rare trees found here are Rudraksha from the Himalayas, paper wood tree, camphor tree, Turpentine tree, Flowering Eucalyptus, Elephant Leg tree etc.

A bridle road made through the shola was much used by the public catalogues of the plants were prepared by the Superintendent under the orders of Government. He attended the Horticultural Exhibition at Madras and visited the Lal Bagh at Bangalore securing new plants and shrubs.

Kalhatty Gardens

The site just above the Kalhatty Falls was chosen for growing plants of warmer climate by McLvor in 1855. The gardens suffered much from the prevailing drought. Rubber and cinchona ledgeriana grew well
in this garden. A proposal was made by the Director for the establishment of a small museum in Ootacamund, which should contain a typical collection of natural objects belonging to the Nilgiri plateau and the Wynnaad. It was approved by government and was under the consideration of a committee during the year 1883.

Barliar Garden

Tropical and sub tropical plants could not withstand the cold climate and winter frost in higher elevations. So the cultivation of such plants especially fruit trees were commenced by Thomas, the then collector of Coimbatore and the Nilgiris in 1851. On the strong recommendations of Mclvor, the Government purchased this land in 1870 for Rs.2000/- made it a garden. It was extended to eight acres of Rubber, Mongosteen, Clove, Cocoa and tropical plants which were cultivated successfully. Fruits and seeds were sold to the public as it is done to day.

All the fruit trees were let to a contractor, gardeners were employed, and those gardeners were incharge of stock growing plants in the nurseries. Liberian coffee and the West African Coffee plants were planted at Burliar. The fruits like mangosteen clore and peaches and spices of the gardens were put up at auction in the commissioners office. This garden which the government possessed on the slope of the Nilgiri plateau was the most important for its size. A new species of coco plant and cera rubber
were lately introduced.

**Kallar Experimental Fruit Garden**

This Garden is situated near the foot of the Coonoor Ghat Road between the river and old Ghat at an elevation of 1300 to 1400 feet and at a distance of a mile and a half from the Kallar Railway station. The garden which is surrounded by virgin forest, was ten acres in extent. It was originally a Mahogany plantation and was handed over by the Forest Department in 1900. It was opened in 1901 for the experimental cultivation of the Durain, a fruit much prized in Malaya. Other economic plants consists of Medicinal and fibre producing plants. A curator office also worked at Ootacamund to look after the lists of the copies of the plants.

**Agricultural Research Station Nanjanad**

The Nanjanad Farm is a research station on commercial crop like potato. This pioneering farm was started in 1917 in an area of 160 acres. It was 17 k.m. West of Ootacamund at an elevation between 2050 and 2226 metres. The following objects were fixed at the time of its beginning.

a. To promote virus free and high yielding potato seeds and other vegetable seeds for distribution to farmers.

b. To produce vegetable and propagate tea plants and distribute to farmers.
c. Demonstration of improved methods of cultivation.

d. Investigation and control of pests. The farm tried rotational crops i.e. cultivation of barley, gooseberry, tomato sugar beat and Oats in succession. Possibilities of developing dairy were also probed. Growing fodder plants met with some success.

The research station obtained different jobs and names like 'Seed Farm', 'Multi Crop Experimental stations' and it is now known as 'State Horticulture Farm'. It has been under the Agriculatral Department since April 1920.

Research was taken up both on agronomical aspects as well as plant protection measures. The major research works carried out from 1921 could be classified as varietal studies, nutritional studies, micro nutrient studies, green manure studies. Seed size, and spacing studies, study on use of cut tubers, force sprouting of seed tubers, study on pest and diseases. Study on fungicide, weedicides etc.

The result of the research carried out on various aspects of potato cultivation is imparted to the forming communities of this district for better yield in potato crop. Infact, this station plays a major role in the establishment of potato as a commercial crop in the Nilgiris.
Trials on other vegetable crops like cabbage, cauliflower, carrot, peas and beans are also etc under taken in this station.

Originally, the curator of the Government Botanical Gardens and parks was in immediate charge of the station assisted by a temporary superintendent under the control of the collector. The station was transferred to the Agricultural Department in 1920, along with several gardens and parks on the Nilgiris. The Government appointed a Mycologist and the entomalogists for conducting experiments for the eradication of potato diseases and insect pest. Government gave more importance to build medicinal and ornamental gardens.

Peppermint Rhubarb Rosemary, Lavender, Digitalis, Taxaxicum were important medicinal plants cultivated in all the government gardens. An Herbarium of Indian plants was started in the year 1883-84. The seeds and fruits of the herbarium were collected and preserved and kept in good order.

Ornamental Gardens

Many ornamental gardens were formed in Ootacamund. The Government gave instructions to install vegetable and floral gardens around the bangalows, both governmental and private. They were of different elevations, suitable for growing drug plants for Medical Department. These gardens were looked after
by the Superintendent of the Government Gardens at Ootacamund.36

Tea Plantation

Tea Plantation in the Nilgiris is more than a hundred years old. In 1832, Dr. Christie, a surgeon on the Madras establishment was placed on special duty to conduct meteorological and geological investigation in Southern India. Within a short time, he applied for a grant of land in the Nilgiris for experimentation with the culture of tea, coffee and mulberry. A committee for tea culture was constituted in Calcutta in 1834. The Government conceded Christie's demand and he wrote to China to fetch seeds and expert tea makers to India.37 It resulted in the distribution of plants to many parts of South India for experiment.

Dr. Christie died before the arrival of the consignment of saplings. It was handed over to the commandent of Ootacamund. Colonel Crewe, under the Superintendence of whom the agricultural and horticultural improvements of the hills were placed. He wrote to the government in 1835 that the shrubs were in good condition. Thus tea found its way to the hills.

Perrottett, a French botanist and Mann, a planter developed tea cultivation on commercial lines in Ketti.38 In 1859 the Thaishola Estate was formed
employing Chinese prisoners of war. In the same year Rae opened the Dansandle Estate on the way to Sholur. Kotagiri Estate came into existence in 1863. Thus by the end of 19th century about 1500 hectares were brought under tea plantations. The tea industry still bears a distinct mark in the tea map of India which employed 63000 workers, half of them being women.

By 1897 tea was planted in an area of 7284.6 ha. in South India, of which some 1214.1 ha. to 1618.8 ha were on the considerable rise from the birth of the 20th century and by 1920 the area rose to 33185.4 ha in South India with 2832.9 ha on the Nilgiris, by 1930 to 58276.8 ha and 5261.1 ha by 1940 to 65966.1 ha and 7689.3 ha. and in 1949 to 6677.5 ha. and 8903.4 ha. respectively.

The district became the largest tea growing one in South India and Sixth in the country. To safeguard the interests of private sector engaged in the plantation of rubber and spices the United Planters Association of Southern India (UPASI) was founded in the year 1893 and it has been playing a vital role in promoting tea plantation industry. Harvesting the crop i.e. plucking takes place throughout the year. The intervals between pluckings upon the rate of growth of the new flush is in turn governed by environmental conditions.

**Coffee Plantations**

Coffee was another cash crop of the Nilgiris until
the end of the 19th century and its place was taken up by tea thereafter. It was introduced in Wynaad from the famous Anjarakandy Estates of Major Brown in 1825 by captain Bevan who stationed his garrison in Malabar.

The first plantation of coffee in Nilgiri plateau was started in 1838 by Mr. Dawson of Coonoor, and another experimental plot was formed at Kalhatti on the Seegur Ghat in 1839 with seedlings from Manantody. The next expansion of area under coffee was around Kotagiri by Mr. Cockburn in 1840. His experiments on Coffee in his Ketti farm in 1838-39 with the seeds from Manantody (in Wynaad) proved successful. However it was Ouchterlony who did it first on commercial basis in 1842.

Cockburn opened Kundha ranges for Coffee cultivation. He was known as the father of coffee enterprise in the Nilgiris. Lascelles and Colonel Scott also made coffee estates down the slopes of Coonoor. The abundant supply of manure from the Coonoor Municipality and liberal expenditure made coffee plantations a great success. Balahardar Estate Hardu Thorai Estate in Kotagiri, Ouchterlony Estate in Gudalur and Banahatti Estate in Hulikkal. Were some of the pioneering estates established by 1850. Despite the leaf disease which nearly swept coffee away from the Nilgiris, more than 500000 acres had been brought under coffee cultivation under the guidance of the United Planters Association of South
India(UPASI)\textsuperscript{42}.

In 1910 as per the advice of Mr. Rudolph Anstead, a planting expert for the hybridization of coffee, the Nilgiris planter's Association requested the Government to grant a piece of land at suitable elevation for experimental purposes\textsuperscript{43}. The suitability of growing coffee in this district was thus established successfully.

The Government at the recommendation of the collector of the Nilgiris, appropriated five acres of forest land in Benhope for coffee hybridisation plot in 1911\textsuperscript{44}.

The natives had about 61000 acres of coffee whereas the Europeans possessed 28000 acres by 1900. Roads and communication system were extended to interior places and labour laws were introduced on the line of labour laws in Ceylon. 36\% of the land of the district was cultivated by coffee and 10.6\% of the land was brought under tea cultivation\textsuperscript{45}. Attempts were made towards having an irrigation system. The introduction of sprinklers in 1898 which was a break through in the hill cultivation caused irrigation system to be given up\textsuperscript{46}.

\textbf{Cinchona Plantation}

Cinchona, the source of quinine assumed importance during the British period. The chinchona tree was introduced in India in 1860, when its acclimatization
and propagation were taken up at Doddabetta under the auspices of the Government Botanical Gardens at Ootacamund.

Of all the plants introduced by the Britishers, cinchona was the most important one. It has its own medicinal value. Its cultivation improved the agricultural economy of the natives. Its plantations fulfilled India's requirements of quinine. It is the only life saving medicine towards curing and controlling malarial fever. The Nilgiri hills were the source for the cinchona expansion in the rest of the country and in Ceylon\textsuperscript{47}.

The quinine yielding cinchona was introduced from South America into India, by Sir Mr. Clements Markhan. His experiments proved satisfactory and in 1862 and 1863 the Madras Government started two plantations one at Dodabetta and the other at Naduvattam\textsuperscript{48}. Later two more plantations were started near Pykara. The three existing plantations are located at Dodabetta, Naduvattam and Hooker (So called after the celebrated botanist). The quinine was manufactured at Naduvattam and sold to the public at a low price through the agency of the post offices. The convicts were brought from the plains, to work in these plantations. One of their camps was pitched at Naduvattam with hospital facilities.

The Nilgiri nurseries supplied saplings to other places in India - to Darjeeling, Assam, Belgam and
Coorg. The cultivation of cinchona yielded more returns on the capital invested, than coffee. The activities of cinchona cultivation and quinine extraction developed to a large extent. It caused the foundation of a separate Directorate in Ootacamund.

The suitable lands for this cultivation were terraced. Seeds were imported from Ceylon, at about 179 and 299 pounds. Barks were harvested during the year 1879-1880. Barks were sold by public auction under the instructions from the Deputy Conservator of Forests of the Government Cinchona Plantations.

Cinchona cultivation in the Sholas

The suitable sholas were for the cinchona crop - harvesting under the scroping system. It was carried out on a small scale level. The removed weeds were buried near the root of the tree. Several thousands of pits were dug on the Naduvattam and Pykara estate for dumping the weeds.

Remission rule was applied only to cinchona plantation. According to that, a plantation of which half the area was planted exclusively with cinchona, would get remission for the latter area only. This rule helped the planters to increase the planting of cinchona as an industry.

New methods were adopted for the higher yield of the cinchona plantation. A new and improved preparation
was made from red chinchona at the Government factory at Naduvattam in 1875. This was a perfect substitute for quinine than the ordinary uncrystallized bebrifuge. It was purchased by the Government officers for the public and charitable purposes.

On the Nilgiris, the proper climate for best kinds was met with and judging from the statement of Dr. Campbelle Thomson and Hooker, equally good localities might be found on the Himalayas. But the crown barks were grown more in the Nilgiris than in Himalayas.

The red bark collected on the Naduvattam government plantations were sold in 1875. Great care was taken to secure well seasoned wood for the cases in which cinchona had to be packed as the bark. The barks had to dry up properly. 1879-80 was favourable to the growth of cinchona. Roads, drains, water channels were maintained in good order on all estates.

Although the crop was large the value of the bark was less in the European Market. Most of the bark was sold in the local Market. Public auctions were held at Madras. Usually the bark was distributed as follows,

- Shipped to the home Market.
- Shipped to the Madras Medical store.
- Supplied to Bombay.
- Supplied to Messers & Co.
In the year 1882-83, 414000 plants and seedlings were sold to the public. 2760 plants were sent for experimental purposes to Malabar and at Mudumalai. 48516 of cinchona seed were sold due to the great public demand. The seeds were sold at lower prices. Barks also brought in less prices, but the market price was realized satisfactorily with prices in England. Public auctions were held in England and Madras.

The Plantations of cinchona were transferred from the Commissioner to the Forest Department in 1883. Mr.M.A.Lawson Director of Government cinchona plantation Mr. Parkes and Mr.Gardens were appointed as the Directors of the cinchona plantation Department. The Directors paid their visits to Naduvattam, Hooker and Wood estates in 1883. Dr.Trimen Director of the Royal Garden visited the plantation and submitted a report that "many plants, suffered from the frosts and by the prolonged drought which followed. Government had taken more steps to develop the plantation wood and wire fence had been put round the whole estate.

All the plantations of Naduvattam and Hooker were inspected by Major Walker, conservator of Forests, accompanied by Dr. Brandis CIE New Zealand. According to their suggestion flax was planted in the steeper places to prevent the soil erosion. Sambur did much
damage in this estate. The nursery seedlings were completely destroyed by the subsequent rain. The supply of labour on the Dodabetta side was scanty while on the Naduvattam side it was excessive. Maisteries and a commissioner were appointed to supervise the work on the plantation. They were also paid salary.

The government quinologists were appointed for the purpose of determining the proportion of the different alkaloids which were found in trees of various ages etc.

Mr. Hooper who was appointed as the government quinologist succeeded in preparing a liquid extract from the chinchona bark. His preparation was accepted by the Director. He sent many species of bark to the colonial and Indian exhibitions.

Mr. Hooper visited the Bengal plantation and obtained information regarding the efficacy of the liquid. His studies were exploited by the Nilgiris plantations.

The quinine and febrifuge manufactured at Naduvattam were tested by the quinologists. Quinine was issued in packets to the collectors. A good quality of chinchona called sulphate of cinchonisidine was made for the first time in 1894-95.
Permanent cooley residential areas were started at Naduvattam for the completion of the work. At Pykara a new corrugated iron verandah was erected around the drying shed. Thatched huts were built on the Dodabetta plantation. So, the supply of labour improved. Annual repairs of the permanent building were carried out.

Rubber

For the first time in South India ceara Rubber Manihot glazia plants sent from kew Gardens London were introduced on the Western foot hills of the Nilgiris (Nilamabur) in October 1874. In 1878-79 four plants of Ceara rubber were planted in the Barliar Gardens. In 1879 some para Rubber plants (Henea brasiliensis) were received by the same plantation from the Botanic gardens, Srilanka.

In 1880 two plants were introduced in Kallatti Gardens. In 1881 some para Rubber and Panama Rubber (Castilloa elastica) were planted in the Government Botanic Gardens at Burliar. Para rubber seeds were brought from the Royal Botanical Gardens, Paradeniya, and the seeds from Burma and Ceylon were experimented in Coonoor at an elevation of 5,900 ft. plots were allotted in Glenbur, Clovelly, Lower Droog, Aderly, Hullocarry and Singara for the rubber plantation. The coffee planters in Kotagiri and Wynaad tried ceara rubber with which A.G. Nicolson and Hawthorne showed great interest. In 1902 A.G. Nicolson introduced para rubber trees in his Glenburn Estates in Kotagiri,
Capt. E.G. Windle and late James Stanes subsequently associated themselves with Nicholson in this venture. The biggest venture in this district was the Golenrock Estate at Bandalur, which obtained rubber seeds from the Burliar gardens.

Tapping began in 1893-94 from the trees in Barliar Gardens\textsuperscript{56}. Tappers and technicians were brought from Assam. In 1904-95 good revenue came from the sale of rubber and it sold in London Market. Rubber tapped from Burliar was sold in Colombo.

\textbf{Estate problems}

The coffee, tea and rubber plantations demanded the immigration of thousands of labourers from the nearby plains, (About 31000 workers in tea industries, 12000 in coffee estates and 400 in rubber plantations)\textsuperscript{58}. The planters had to make good amount of advances to the employees, who often deserted the planters. The Madras planters Act of 1903 was made to protect the planters against the loss of advances made to the workers. The system of kangani existed until the labour legislations of 1958\textsuperscript{59}. The labourers organised themselves into collective bargaining forces. It was in the Nilgiris that earliest Estate Labour Union was set up by the congress leaders to draw the attention of the government and consequently the Royal Commission of Labour was constituted in 1931\textsuperscript{60}.
Eucalyptus on the Nilgiris

In the whole of Indian subcontinent, the Nilgiris was the first district to see the introduction of eucalyptus species in 1843. A few experimental trees of eucalyptus were planted for more supplies of fuel. Eucalyptus globulus popularly called as the 'blue gum' plantations were started in the Nilgiris in 1856.

Cultivation of Tan Bark Wattles on the Nilgiris

Forests in South India contain more than 300 vegetable tanning materials. Silver Wattle (Acacia dealbata) was a valuable tanning material introduced into the Nilgiris in 1840-43 as a quick growing species to provide cheap fire wood for the army stationed at Wellington.

Potato

Among the English Vegetables introduced by the Britishers in the hills, Potato was the most importance one. It is a chief dish and a cash (trade) crop both internally and externally. The Badagas and the Kotas who were vegetable gatherers, took to its cultivation because it was found lucrative and nutritious. The pastoral Todas, considered ploughing as below their dignity but at the same time developed interest in the cultivation of potato for their benefits.
In the Botanical Gardens, Ootacamund, the seeds of good yielding varieties, are selected and distributed to the residents and native farmers. The Revenue Board also obtains various kinds of potato seeds which they sell to the natives. Accordingly seeds of Britain Queen, Early Puritan, sensation six John LleNewwyn, the Croter and Duke of York were conveyed from England in 1906 and given away to the farmers. These varieties thrived well in the Nilgiri climate and in its black peaty soil and reddish brown loam.

The cultivation of Potato was affected by a disease which was caused by the fungus. Government took necessary steps to prevent this disease and the Destructive Insect Pest Act 1919 was passed.

Seed farm of Nanjanad concentrated on potato cultivation as the demand for potato increased during the two World Wars and the Boers' war. The potato cultivation was extended to 4000 acres in 1914, 80000 acres in 1920, 12000 acres in 1938 and 20000 acres in 1950.

English Vegetable, Fruits and Ornamental plants

The movement of growing English vegetables, fruits, trees, and ornamental plants was started in Dimmatti in 1820. Every British residence had a kitchen garden and a commercial subscribers garden also
existed, which met the vegetable demand. The experimental gardens improved techniques of vegetable cultivation and produced hybrid seeds. The Nilgiris became the major source of English Vegetables. The hills produced and exported large quantities of vegetable to meet the requirements of the fighting forces abroad. As a result of this, communication system was developed.

George Oakes opened the first commercial fruit garden in the hills. Charles Gray and John Division who were trained in Kew Gardens, London following George Oakes, established Orchards in Coonoor. The Badagas also joined the English residents in planting imported fruit trees. The pomological station, opened in 1820 in Coonoor and the Burliar Garden which was established in 1871 came under the care of Dr. K.K. Naik, the Government Fruit specialist who helped the fruit production in the Nilgiris on a large scale.

Humid zone fruits like, litchi, durain, rambutan, avocado, grape fruit were introduced in this hill station from abroad by the Britishers in 1848. In 1855 W.G. McIvor opened a small fruit nursery near Kelhatti falls and maintained 178 specimens of fruits planted. E.B. Thomas then Collector of Coimbatore and Nilgiris established a fruit Garden at Burliar.

Subsequently, in 1900 another fruit station was established by the Government at Kallar, for
introducing fruits suitable for the lower slopes of the hills. In 1920, a Third fruit station at the elevation of 5600 was established at Coonoor.

Citrus is grown on the Nilgiri Hills up to the elevations reaching 1676.4. It was given a commercial status by the Britishers.

The Mandarins or the "loose Jacket Oranges are found in Kulakambai, Gudalur, Kukal, Kunjapanai area, Kagguchi Village, Naragiri and Kampatti. Other citrus species namely Pummelo, triumph and marsh seedless varieties of grape fruit were also introduced by the Britishers.

Horticultural Societies

The earliest gardens at Ooty were the storehouse and Southdown, owned by Mr. J. Sullivan and by Captain Molyneux respectively who took charge of supplying vegetable. They subscribed Rs. 3 a month and received their vegetables free of charge. This arrangement was found satisfactory.

In 1847, a fund was raised by means of donations and subscriptions, with a view to form a horticultural society, and start a public garden. The marquis of Tweeddale, who was at the time Governor of Madras, took a great personal interest and in addition became a regular subscriber of the scheme and contributed a donation of Rs. 1000. It was proposed to appoint
scientists and amateurs with extensive knowledge for research in 1847. As a result the Horticultural Society was formed in the same year and a committee was constituted to look after the public garden. In order to enlarge the garden Mr. W.G. Mclvor was brought from Royal Botanical Gardens, at kew, in 1848. He converted a portion of the gardens, its rugged paths into easy walks. Terraces, lawns and flower beds were also planted with a rare selection of plants. A piece of government shola (reserve forest) near Doddabetta range was first brought under cultivation. In 1853, Mr. Mclvor was appointed as the superintendent. He formed an exofficio committee consisting of the Collector, the officer commanding, and the senior Medical Officer to visit the garden. Till 1853 the gardens had been known as the "Horticultural Gardens" later it came to be called "public gardens" and the Government 'Botanical'. In November 1855, Lord Dalhousie recommended that the gardens be taken over by Government and in September 1857, they were placed under the control of the conservator of Forests. The accounts were audited by the commandant of the station. After 1883 Government gardens and parks were brought under the control of the Government Botanist and superintendent of cinchona plantations.

During the middle of 1896 the above two appointments were brought under the control of the collector. In 1871 the Superintendentships of the gardens and the Government Cinchona plantations, which had hitherto been treated as a combined appointment, were separated
and Mr. Proudlock from the royal botanical gardens, Kew and the botanical gardens, Calcutta took charges of the gardens. In 1896 these above officers came under the control of the Collector.

The Agricultural and Horticultural Society

It was started in January 1869, by the then commissioner of the Nilgiris, Mr. J.W. Breeks. It conducted annual exhibition. In October 1869 a show was held at Stonehouse, inaugurated by the then Governor, Lord Napier and Ettrict the Horticultural secretary. The show was largely attended. The society continued to hold minor yearly fairs and the last fair took place on 6th October 1882.

The Nilgiri Agri Horticultural Society

The Nilgiri Agri Horticultural Society was inaugurated in 1869, under the patronage of the Governor J.H. Tremenheera and the Collector of the Nilgiris. The aim of the society was to involve the public in the promotion of agriculture and horticulture.

The society was registered (Reg. No. 35) under the Registration of Societies Act. It consisted of 500 members of very elite citizens and officials of the Nilgiris. The office of the society was sheltered in a small building inside the Botanical Gardens, Ootacamund. It maintained a good library of useful
books and publications on the art of gardening and farming. The Governor had permitted the society to have a nursery near the lower guard room of the Raj Bhavan. The society maintained the nursery with the services of trained gardeners. It was raising flower seedlings and vegetable seeds for sale and the show. The society members enjoyed the advantages as follows.

1. Discount of 33\% on purchase of seeds and seedlings raised at the nursery of the society.
2. Complimentary tickets for the Flower show.
3. Free use of the society's library.
4. Free advice on gardening.
5. Free supply of society's bulletin.

Flower show and Fruit show

The annual Flower show at the Government Botanical Garden Ootacamund was inaugurated in 1857. The Fruit show was held in 1860 in Sim's Park, Coonoor and it became the highlights of the activities of the Society by conducting these shows and giving away prestigious awards to the prize winners.

The Forest Policy of the British Government in Nilgiris

The British Government in India introduced a conservation policy under the then inspector General
of Forest Sir Dietrich Brandis. In 1864 on the advice of Dr. Voclker, a German expert, the British Government passed a resolution on 19th October 1864 declaring a Forest Policy. In 1865 the Indian Forest Act was passed.

The Nilgiri forests, namely the sholas of the upper reaches, the tropical and subtropical forests on the low altitude slopes, fauna and ecological system underwent significant changes in the British Regime. The British introduced the concept of forest fire protection and the system of long rotation and building up of the forest capital of growing stock. The present day forest conservation policy took its shape during the British rule. Individuals as well as the British Government made detailed studies of the sholas, Grass lands and the wild life. Forest management, preservation of wild life and introduction of exotic flora and fauna were some of the important contributions of the Britishers.

Leshenault, who accompanied Sullivan in 1819, opened the doors to the Nilgiri plant life, which remained unidentified till then. The reports of those who followed Leshenault described how extensive deforestation and swidden cultivation had left a deep scar on the mountain slope. Wallich, who made the earliest report on the forests of Madras and Bombay Presidencies (in 1827) was said to have laid the foundation for conservation.
Nilgiri Sholas (Government reserve forest)

The Sholas of the Nilgiris are unique in many respects, the kind of which is yet to be seen elsewhere in the world. Every such forest is a complex and closed circle of ever green trees shrubs of two or three strata and a thick under-growth of ferns, orchids, fungi, mass and innumerable living organisms. It was found out that the sholas take thousands of years to form. They improve soil, secure springs shelter violent wind; maintain high degree of humidity and modify the climate. The properties of these forests were the subject matter of the British Association for the Advancement of science meeting held in Edinburough in 1850. Subsequently a committee was constituted to bring out the new dimensions of the Sholas. The observations made in the report in 1851 hold good even in the modern context.

The ratio of the forest, grass and arable lands of the Nilgiris before 1850 was 45%, 15% and 20% respectively. Subsequently with the introduction of commercial crops like coffee, tea, cinchona and English vegetables, large tracks of sholas, swamps and grass lands were brought under cultivation.

The Government gave instructions to the public, that they should not collect the Minor Forest Produce, such as Wallnuts, Tamarind, cheekacoy, (soap nut) in the forests of Seagoor Mudumalai and Bennai, such articles belong to the Government and should be
collected under the supervision of the Forest Department.

Fire wood Allotment Rules came into action in 1881 according to which lands in the Hill Settlements and in the neighbourhood were required for planting trees for fuel or other purposes.

The Reserved Forests were closed against shooting and fishing. The collector of Nilgiris had the right to protect the Reserved Forests by declaring government orders. The Reserve Forest was divided into 5 Reserves i.e. Aramby Reserve, 2. Cairn Hill Reserve, 3. Governor's Shola Reserve, 4. Baikie Reserve to Coonoor and 5. Coonoor peak Reserve.

Reserve forests were protected from the fire. The persons who lit fire in the forest were detected and prosecuted. Village officers were given the right to report all fires occurring within village limits to the Deputy Tahsildar and nearest Forest officer.

Public was not allowed to cut trees and permit any animal for grazing without prior permission of the collector and maniyagar.

According to rule II of the Government Order there was Village Panchayat, which consisted of a maniyagar, a Karnam and three principal ryots of the particular village. The duty of the panchayat was to take action against the village display. The maniyagar was the
sole person for forestry administration of the village. If the maniyagar did not followed the governmental rule he would be liable to be punished on the magistrate either one year imprisonment or a fine of pay one hundred rupees or both.

First conservancy establishment

In 1852 the government sanctioned an establishment of First Forester and 6 peons for conservancy purposes. Mr. E. B. Thomas was at this time collector of the district, Under whose jurisdiction the hills saw the filling up of the sholas in and around Ootacamund.  

Cleghorn suggested certain measures for the conservancy of forests cutting the trees should be minimised, preservation of certain number of trees; replanting the quick growing trees and trees should be planted for ornamental purposes and for fuel. The resuggestions were accepted by the government, and passed by many conservancy acts. A Deputy Conservator of Forest, and an overseer were appointed to look after the Nilgiri sholas and plantations.

Transfer of forests and plantations to the commissioner

The conservancy however continued to be ineffectual and on the creation of the Nilgiri commission in 1868, the conservancy of forest and plantations was transferred to the commissioner. Under Jungle
conservancy Rules, a special officer was appointed in 1869 placed under the commissioner, drawing a special horse allowance from the conservancy fund. Major Jago was the first man who was appointed as the special officer.

Retransfer to Forest Department

At the close of the 1874-75 the sholas and plantations were retransferred under sanction of government of India to the Forest Department\textsuperscript{81}. In 1878 a commission was appointed to look after the woodlands in the plateau.

Sanctuaries

When the first European came up to the Hill, the plateau was a natural Game Sanctuary, where the balance of nature had remained virtually undisturbed from time immemorial.

In 1914 Mudumalai area was acquired by the government under the Land Acquisition Act\textsuperscript{82}. In 1927 the area was again included in the Reserve Forest. From 1910 to 1922 the forest was worked under a working plan prepared by Mr. Cox. Under the direction of Mr. Cox from 1910 to 1922, much was done to open up the forest by constructing roads and buildings and fire protection was really taken in hand\textsuperscript{83}. 
Another government order came into force in 1946. Under this order, public were restricted to cut blue gum tree without the previous permission of the District Forest officer of the Nilgiris.

Forest Management and conservancy

Captain Watson of the police department was appointed as the conservator of forests to accomplish the forest policy. Preservation and conservancy policies were further motivated. Conolly, the collector of Malabar, raised teak plantations with the assistance of Chatter Menon, in 1842 on the Western slopes of the hills. Mciver the superintendent of Ootacamund Gardens was asked to renovate the sholas. According to the Annual Report of 1857, a full time officer was appointed for effectual conservancy. It was approved by the Government. A severe law namely the Madras forest Act of 1882 was passed and the objectives of the law were

1. to demark and declare the definite boundaries of Government forests and safeguard them and
2. to afford protection to the wild life habitats.

Steps were taken to plant up the open areas in the hills with fast growing exotic trees like Wattles (acacia), broom gorse etc. The road bunds of the Nilgiris were also planted with such trees to bind
the soil. The orders of the Government enclosed the ecological benefits and insisted on the importance of green cover.

Conservation of wild life

The Nilgiri fauna was as rich as its flora. The combination of the sholas had grasslands often intercepted by perennial streams which nourished many species of the animal kingdom. Some species like the Nilgiri tahr, the Nilgiri langoor, the gaur, the Nilgiri laughing thrush, the Nilgiri Salian etc. are endemic and have embellished these hills from time immemorial.

The reputation of the Nilgiris as the best hunting grounds in the south was great. Tigers, leopards, elephants, slosh bears, ibex, various, deer and antelopes, hyenas, wild dogs and wild boars could be found on the slopes and plateau of the region in the early decades of the nineteenth century. It was the Britishers who opened the 'Sportsmen's paradise' for the rest of the country.

The British government responded to the consequences of their depredations with preservationist initiatives. In 1877, a group of Ootacamund 'sportsmen' who had become alarmed by the domination of game formed the Nilgiri Game Protection Association, which drafted the Nilgiri Game and preservation Act,
The Nilgiri Game Protection Association succeeded in introducing woodlock, snipe, and other British game birds to the Nilgiris, as well as the spaniels and other dogs to hunt them. It also attempted to stock Nilgiri streams with trout - a Herculean endeavour which was subsequently assumed by the Madras government, which imported eggs from Germany, Wales, and New Zealand.

The first foxhounds were introduced to Ootacamund as early as 1829, and a regular pack was running by 1845. By the late nineteenth century the Nilgiri variant of the English fox hunt - the Jackal hunt - had become fully institutionalized, with a regular "Season".

But the conserving policy both at the government and individual levels, the central government legislations like the Wild Elephants Protection Act of 1876, banned the hunting of the wild life.

The Nilgiri District Game Association was born in the meeting held on October 3, 1877 in the Secretary's room of the Nilgiri Library. Colonel Wilson who presided the meeting was elected the first Honorary Secretary of the Association.

One of the main objectives of the Association was the preservation of the fauna of the Nilgiris. The
committee, appointed for drafting the rules of the Association carefully made the by laws. The "South India observer" which was then a well circulated daily from Ootacamund brought out the aims and salient features of the Association.

The Association also aimed at the preservation of game and fish; It introduced and acclimatized new species in the district. Public was restricted from shooting kinds or cow bison. An entrance fee (Rs.5/-) was collected from the sporting gentlemen and the proceeds was paid to the Collector. Gun tax was collected and fishing license was issued by the Association. The government readily recognised the role of the Association for which the collector and the forest officials were the ex-officio president and advisers respectively. In accordance with the Forest Laws made then and there, the Association functioned efficiently.

Fisheries

The indigenous fish encouraged the Britishers to try with exotic fish especially the delicious trout, in the high land waters of the hills. The first attempt was made in 1863, by E.C.G. Thomas to bring trout ova which died before hatching. Dr. Francis day in 1866 took keen interest and arranged to bring 6000 trout ova from abroad and introduced in the Government Gardens and Ponds in Ootacamund.
The Madras Government sanctioned for experiments on acclimatization of breeding European fresh water fishes such as trout, tench, rudd, carp, gold and silver fish (imported from Scotland).

In August 1869, Lady Napier and Ettrick placed fishes in the Ootacamund lake\(^{95}\).

**Trout Culture**

Trout is essentially a sport fish much sought after by the Britishers. The variety of trout which has been established in the Nilgiris is known as the Rainbow Trout.

The Nilgiri Game Association, suggested to appoint an expert for the promotion of fisheries. The Government accepted the suggestions 1906 and obtained the services of H.C.Wilson (Pisciculturist of the Nilgiris in 1906)\(^{96}\). He made the trout culture on sound basis. He identified Avalanche Parson's Valley, Pykara, Emerald and Belithala Streams fit for trout culture. He constructed a trout hatchery at Avalenche for the rearing of trout. He brought 100 yearlings from his own country. Twenty seven of them survived and were placed in the Parson's valley stream in 1907. On his recommendations one Fishery Inspector and eighteen watchers were appointed under the Indian Fishery Act. The Indian Fishery Act\(^{97}\), was passed to preserve fisheries in the Bhavani and Moyar and other rivers. In 1912 new rules were enacted for
the protection of trout in the Nilgiris.

H.C. Wilson arranged to transport trout ova from Herr Jaffe's Hatcherry at O.Snaburek in Germany in 1907. Eggs were received from Denbling's Hatcherry, Wales in 1908. The New South Wales arranged for the supply of rainbow trout ova from Newzealand in 1909.

On September 5, 1911, Sir Aurther Wellesly released live trouts from the Avalanche hatchery in the Karurmund stream. Soon other streams were stocked with trout. For the first time trout became a regular sport. The management of trout fishing was handed over to the Nilgiri Game Association in 1920. The reservoirs made for hydropower generation also provided ample room for trout culture.

Genis of Hydro – Electric Generation in the Nilgiris

The potentials of Hydro power generations were discovered by the Britishers for the construction of dams across rivers and the channelising the waters to generate electricity was an important administrative reform of the Britishers. They led to the over all developments in the Nilgiris and Coimbatore areas in particular and South India in general. In the tough terrain and under bad weather conditions how the pioneering attempts in this line bore fruit is a matter of great interest.
The first unit of hydro-electric generation was established in 1902-03 in Kateri. This was the first of its kind in Asia. Power produced from this unit was utilised in the construction of the Aruvankadu Factory. Similar tiny plants came into operation in some of the tea estates. This was prior to the first electric supply in Madras city in 1909.

Glenmorgan Scheme

Proposals for power generation on large scales using the Nilgiris water resources were made at the turn of the century. Points of water storage at high altitudes in the hills were identified. On recommendations, the Department of Electricity, Madras Government, sanctioned Rs.12,38,300/- for construction of the Glenmorgan Hydro-Electric scheme in 1927. It was meant to supply power to Ootacamund. It also helped the construction of pykara-Hydro-Electric power generation unit at a later date. But the records are silent about the Earthern Dam and a small plant of power generation near Thalaikundha which supplied power for the construction of Glenmorgan Scheme itself. The work of Glenmorgan Scheme was started in September 1928 and the first two plants were successfully put into use in November 1929. A third plant was installed in 1931.

Pykara Scheme

The success of Glenmorgan Scheme encouraged
another power project in Pykara. Extensive investigation into the annual rainfall, volume of water available in various seasons, height advantage etc. was undertaken. River Pykara which originates in Mukruthi area was found to provide abundant water. The 12.5 Sq. K.M. area is the largest catchment in the Nilgiris. The river is winding through the plateau for nearly 40 k.m. gathering water from various streams. The greatest advantage is the drop of 1000 metres in a few kilometers distance offering great potentialities.

Based on the technical details three different schemes namely A, C and D were drawn in March 1929\textsuperscript{101} and submitted to the Government of India for sanction. Scheme A and D aimed at meeting the requirement of electrifying the South Indian Railway Main line at a very great cost. Since the cost of the project was less and the feasiblity of implementation of the same was more, the Secretary of state for India approved the same and sanctioned Rs.1,26,39,900/- in September 1929\textsuperscript{102}. It was agreed that other schemes would be considered for implementation in due course.

The preliminry constructions were commenced at once. In November 1929 two dams were caused across the Pykara river in two different levels. One in the high plateau (Mukruthi Reservoir with 1800 million cubic feet capacity)\textsuperscript{103} and the other in Pykara (Pykara Reservoir with 2,000/- million cubic feet capacity). The Sandinallah stream was checked to make kamaraja
sagar at a later date to supplement. The completion of the first stage of work including the installations of machines was reported in April 1933.

The Pykara plants served satisfactorily eversince its commission in 1933. A continuous supply of electricity between 250 and 615 Kilo watts has been ensured to the Madras State Grid after the completion of the Second stage in 1941.\textsuperscript{104}

The Pykara power house located at Singarah (32 k.m. from Ootacamund) is of 3400 feet elevation from the Mean Sea level. It was considered the highest head plant in Asia and one of the five highest head plants in the World.

These installations had far reaching effects both in terms of distance and time. It led to a more ambitious project namely the Kundha power project with plants, which was completed in the post Independent period with Canadian collaboration. The Nilgiri waters pumped power to distant places of Madras Presidency. Electrification took place in Ootacamund and Coimbatore leading especially to the industrialisation of the latter.
References


23. Government Order NO.1921 (Revenue) dated 22nd June 1911, P.3.
27. The Burliar Experimental Fruit Garden is situated on the Coonoor Ghat near the toll bar of that name and in 2500 feet above mean seal Level. In 1870 Government purchased for 2000 this garden with a view to try economic plants. This had been originally formed by Mr.E.B.Thomas when he was collector of Coimbatore and
Nilgiris (1851-1858).


40. The Indian Agriculturist, A Weekly Journal of Indian Agriculture and Minerology and statistics Volume XVII, 1892, P.62.

42. Tea Blight - a disease in Plants which blasts or withers them caused by Greenbug. The disease was spread in the year 1914, and it was considered Pest Act. A scientific officer, was appointed (Mr. R.D. Astead, B.A.,) by the government. Although the pest Act was introduced it did not produce any good results. The march of progress was a slow one until 1928, when it was considered essential that the planters should have a scientific Department. This led to the establishment of the UPASI (United Planters Association of South India) Tea Scientific Department.

44. Letter from the Secretary to the Commissioner of Land Records and Forests, dated January 27, 1911.
51. Sambur, Name of the Nilgiri Goat.
58. An advance of Rs.10/- per head was made until the wage Act of 1947.
59. Kangany or Kankany is a Tamil Word which refers to the agent and supervisor of a gang of labourers. As middle man between the planters and labourers to Kanganyes used to exploit both.
75. Sholas (Reserved forests) (It is a Badaga term)
77. Natural plants, Sholas and grass lands are equally important to the biosphere. The grass lands are the most dependable habitats for many species in the animal kingdom like, the tahr (mountain goat) gaur (Indian bison), Sambur, elephants etc.
92. Nilgiri District Gazetteer, 1877, P.70.
98. Madras Government Order, Forest Department, No. 1284, dated September 4, 1926.
99. Reading of the Slab in the Kateri Dam.
100. Pykara Hydro Electric Scheme, Record of Tamil Nadu State Electricity Board, Head Office, Madras, P.1.
102. Remains of this dam can be traced near Thalaikundha. Interview with Mr. Raman, Superintending Engineer, Electricity Board, Manjoor Nilgiris, On 6-5-1991.
103. Completion Report, Glenmorgan Scheme, 1931, Tamil Nadu State Electricity Board, Madras.
104. Pykara and Moyar Hydro Electric Scheme Technical details of Dams and Reservoirs office of the Superintending Engineer, Electricity Board, Manjoor.