RESEARCH METHODOLOGY
CHAPTER III
Research methodology

Health problems and health practices of any community are profoundly influenced by interplay of a complex of social, economic and political factors. These factors have also had considerable influence not only on the development of medical technology but also in determining the access of different social strata of a community to such technology. The study of health culture of communities belonging to poorest strata of the society is highly essential to determine their access to different health services available in a social set-up. "This sort of studies will operate as feed back to the national development programmes to develop a more meaningful health services which is certainly a level for overall national development."

3.1 Research Design

The design of the research is descriptive in nature, which describe the health (reproductive health) of toda tribes of Nilrigi District of Tamil Nadu. Health studies take place in different aspects but in this study it is focused on reproductive health of tribal women and general health condition and practices among the Toda tribe. This study is also describing the health of Todas with related to socio-cultural dimensions of the people including food habits, marriage and health, mother and child health, nutrition and Environmental health.

3.2 Main objectives of the study

1. To study the socio-economic and cultural conditions of the Toda tribe of Nilgiri District.

2. To find out the awareness among Toda tribe regarding health and disease as well as to understand the health status of Toda tribes.
3. To portray the inter-relationship of health status of Toda tribe with their cultural and religious practices.

4. To know the availability and utilization of traditional and modern health care facilities among Toda tribe.

3.3 Research hypotheses of the study

1. There is a significant relationship between educational level (husband) and awareness of water borne diseases.
2. There is a significant relationship between educational level (wife) and awareness of water borne diseases.
3. There is a significant relationship between educational level and use of boiled water for drinking.
4. There is a significant relationship between educational level (husband) and awareness on pregnancy care.
5. There is a significant relationship between educational level (wife) and awareness on pregnancy care.
6. There is a significant relationship between educational level (wife) and regular check up during pregnancy.
7. There is a significant relationship between educational level (wife) and awareness on breast feeding.
8. There is a significant relationship between respondent (wife) preference of doctor and educational level.
9. There is a significant relationship between family income and husband educational level.
10. There is a significant relationship between income level and wife's educational level.

3.4 Significance of the study

The health problems and practices of any community are profoundly influenced by interplay of social, economic and political factors. The common beliefs, customs and
practices connected with health and disease have been found to be intimately related to the treatment of disease. It is necessary to take a holistic view of all the cultural dimensions of the health of the community and to relate such a holistic perspective to the over all culture of the concerned community. The health problems need special attention in the context of tribal communities of India. Tribal populations have distinctive problems, not because that they have special kind of health, but because of special placement in difficult areas and circumstances in which they live. To fulfil the goal of health for all, it is high time that sorting of the problems of difficult areas, specific groups of populations and of need based health problems at large should be done on priority basis. The health, nutrition and medico-genetic problems of diverse tribal groups inhabiting widely varying geo-climatic and ecological conditions have been found to be unique and present a formidable challenge for which appropriate solution have to be found by planning and evolving relevant research studies which should be need based and problems solving in nature.

Health of the people is not only a desirable goal but is also an essential investment in human resources. Bhore committee report of 1946 itself pointed out the necessity of an integrated primary health care, social and preventive medical care, people's participation and strong inter-sectoral co-operation. The National Health Policy (1983) reiterated India's commitment to attain "Health For All (HFA) BY 2000 A.D."

3.5 Health Problems of Tribal Communities

While considering the health problems of tribal communities it is important to recognize certain characteristics of tribal people and tribal areas:

They live in inaccessible area or forests, and are isolated due to poor communication facilities. There exists economic stagnation, cultural patterns unfavorable for development, lack of employment opportunities and poor educational facilities. They have a poor quality of life due to scarcity of essential goods, facilities and money, social injustice, land alienation, poor or no representation etc.
The health problems of tribal communities are of two types

1. Special health problems that differ from those of the general population in India and often vary from some tribal community to another.
2. General health problems that resemble the health problems of rural areas in India.

3.6 Tribal health scenario


The widespread poverty, illiteracy, malnutrition, absence of safe drinking water and sanitary living conditions, poor maternal and child health services, ineffective coverage of national health and nutritional services are the main reasons.

3.7 Area of the Study

The Nilgiri is a mountainous district situated at the junction of Eastern and Western ghats at an average elevation of 1970 meters. This District is landed by Coimbatore District, Erode, Kerala state and Karnataka state. It consists of Six Taluks (i.e., Coonoor, Kothagiri, Gudalur, Udhagamandalam, Pandalur and Kundha)

The Udhagamandalam Taluk is a hilly tract with a number of Mountains and valley and it has also within its boundaries, the highest peak in South Viz., “Doddabetta” at an attitude of 2623 m. Coonoor and Kothagiri hilly taluks are at an average height of 1990 m above MSL Gudalur Taluk has got two District tracts, Viz., O’Valley on the East and Wynaad on the West bordering Kerala State. The former is a hilly tract while the
Wynaad is a table land, situated on an average elevation of 1000 m above MSL. These geographical and physical features have a bearing on the distribution of various primitive hill tribes of this district.

According to 2001 census, the total population of the Nilgiri District is 7,64,826. Out of this, the tribal population accounts for 30393. The total Todas population of the district is 1913.

The main tribal communities found in the District are Todas, Kodas, Kurumbas, Irulas, Paniyas, Mullukurumbas and Kattunaikkans. These tribal communities are not evenly distributed in the six taluks of the district. There is as heavy concentration of about 50 percent of the tribes in Gudalur taluk followed by Kothagiri taluk with 25 percent of the Tribal population. Udhagamundalum and Coonoor taluks have with 16 percent and 9 percent of the tribal population. It is interesting to note that Paniyas, Mullikurumbas and Kattunaicks live on the lower western slope of the district up to an altitude of 1200 m. In Gudalur taluk, whereas Kurumbas and Irulas mainly live in tracts between an elevation of 1200 m and 1500 m. On the Kothagiri Taluks the Kodas are living in places at an elevation of about 1800 m MSL in Udhagamandalum and Kothagiri taluks while the Todas occupy the top of the plateau mainly in Udhagamandalum taluk. This geographical distribution has invested the different tribes with distinct characteristics and mode of living.

3.8 Universe and sampling of the study

Respondents of the study area having the following inclusion and exclusion criteria were chosen as sample.

Inclusion criteria
- Parents are in the reproductive age group and having children under the age of 5.

Exclusion criteria
- Parents are not in the reproductive age group and not having children & Widows.
The respondents of the total number of families were chosen based on the above criteria. The universe of the study is total number of households of the Todas villages in four taluks (Udhagamundalum, Coonoor, Kothagiri and Kundha). There is no Toda village in two taluks, i.e Gudalur and Pandalur out of six taluks of the Nilgiri District. The total numbers of households of the Toda tribes are 300. This is the population; in order to have reliable data collection the study proposed to have multi-stage purposive simple random sampling method. The sample size is 100 households, which were selected from 30 villages out of 65 Toda villages of the district. This makes one third of the population. Hence the sampling is systematic. The unit of the study is both husband and wife who have been married for 3 to 5 years. The married couples those who do not have a child and widows are excluded in this study.

3.9 Tools of Data collection

The primary data for the study were collected through an interview schedule and observation technique was used to cross check the data. A relevant, appropriate and detailed interview schedule was developed for the purpose of data collection consisting of mostly open ended and multiple choice questions, in order to probe deep into various socio-cultural and health features. The final interview schedule so prepared consists of 157 questions under different categories, viz., general information, family members details, asset possessed, education and employment, food habits, personal hygiene, marriage and health, environmental health and reproductive health.

3.10 Administration of Interview Schedule

Administration of the interview schedule was a sensitive problem. This was realized when the interview schedule was pre-tested. At the time of final administration of schedule the investigator had to face several problems. First, when the purpose of the study was explained, the respondents were not convinced. But however before the collection of data the investigator established a good rapport with the respondents. Necessary care was in building up rapport with the help of Tribal Research Centre's
(TRC) staffs, Block Health Statisticians, Health Inspectors, VHNs, Village Heads, Local leaders and PHCs staffs. The data were collected through personal interviews. The respondents were, both husband and wife in the selected households. But the information given by the Tribal women (Wives) were considered as more reliable and have been taken for the study, but wherever the information provided by the Toda men also been analysed and were found useful for understanding the socio-cultural meaning of reproductive behaviour of the Toda tribe.

3.11 Interview process

The primary data were collected through interview schedule. With the help of the interview schedule both the husband and wife were interviewed. The final interview schedule consists of 157 questions. Some of the questions in the schedule dealt with confidential information of their reproductive health. It was therefore, necessary to have interviewed separately and in different days in order to gather the actual information. Each interview took about 45 to 60 minutes. First 5 to 10 minutes were spent on introductory talks. The data were completed in a period of 5 months time. The time chosen for the interview was in the morning from 9.00 a.m. to 12.00 Noon and in the afternoon from 2.00 p.m to 5.00 p.m. In many cases the researcher interviewed the respondents at the field where they work, yet the respondents spend some time for this and very patiently answered. The timing was chosen very carefully to see the availability and convenience of the respondents.

3.12 Tools of Analysis

The data were subjected to statistical analysis such as Averages, Percentages, and Chi-square test, Correlation, Paired T-test, One-Way ANOVA. After analyzing all these facts an interpretation has been furnished.
3.13 Validity and Reliability

Social research does not guarantee cent percent validity. Problems of validity are faced by every research particularly by those who deal with personal views, attitudes and interaction processes. To study these aspects of the villages, qualitative responses are also required and cent percent validity of qualitative responses cannot be guaranteed.

3.14 The challenges of Tribal Health

The tribal groups face an onslaught on their culture by modern civilization inducing far-reaching biologic changes, which threaten the very existence of some of these communities. This presents some usual and unique challenges- humanitarian, biologic, medical and scientific-challenges which have an urgency and importance far out of proportion to the relatively small number of people involved.

Meting these challenges will not only provide data of considerable scientific interest but also one which holds tremendous hope for the tribals. In some cases the data are so crucially important that it may be the deciding factor between their survival and extinction. In other groups it would facilitate progress towards the mainstream of national life.

The humanitarian challenges: The recent years have been a time of awakened social conscience. The Government has shown extreme concern for these vulnerable groups. Laws have been legislated to help them socially and economically. In order to bring the full benefit of these enlightened policies, a comprehensive study of their medico-genetic and health problems is vitally required.

The biological challenge: The primitive tribal groups present both in their size and level of economy the closest approximation one can find to the conditions under which man has lived for the greater part of his existence. It is probable that much of the genetic endowment of man has been shaped by forces of natural selection and evolution far more
comparable to those to be observed in the surviving primitive group than in today is major culture-complexes.

The medical challenge: The larger tribal groups due to their location in rural areas suffer from similar health problems which affect the great part of our population such as malnutrition, gastrointestinal and respiratory disorders, and other infection and parasitic disorders. Additionally due to their isolation, endogamous marriages, and higher coefficient of inbreeding they represent a concentration of genetic disorders such as sickle cell hemoglobin, G-6-PD deficiency etc.

The scientific challenge: Indian scientists, notably anthropologists, geneticists and hematologists have carried out a large number of studies in tribal groups to determine the distribution of various genetic markers such as sickle cell gene, G-6-PD enzyme deficiency, serum protein polymorphisms and red cell enzymes. (Malhotra, 1978; Verma, 1978; Roy Choudhury, 1983; Sukumaran, 1985; Baxi, 1985). However there have been very few studies to examine the health implications of these genetic markers or to investigate the interaction between various environment factors and the genetic markers.

3.15 Limitations of the study

The findings of the study based on the information furnished by the respondents, which may have its own limitations. The objective of the researcher is naturally circumscribed by the extent of the respondent's readiness to give truthfull information. Possibility of hiding certain facts on the part of the respondents can not be ruled out, although every possible efforts were made to elicit reliable information.

The technique for the collection of data was the interview schedule for which respondents furnished the necessary information in response to various items included in the schedule and the researcher used observation to verify the validity of information obtained through cross checking the same with other than the respondents in the village.
3.16 Nilgiri District profile

Brief history of Nilgiri District

The earliest known history of the Nilgiri dates back to 930 A.D., when Wynaad was under the Ganga dynasty of Mysore. Wynaad and the plateau then came under the reign of the Hoysala rulers during the 12th century. Who were later overthrown by Mussalmans of Delhi. With the decline of the regime of the Mussalman rulers of Delhi, Wynaad and the Nilgiri came under the Mysore kings during the early part of the 17th century.

In the later part of the 18th century, Hyder Ali usurped the throne of Mysore. As a result of the last Mysore War, the Nilgiri plateau which was then known as Danaikancotah district was merged with East India Company. In 1800, Dr. Francis Buchanan reached the hill by walk. It was only in 1812 that a serious attempt was made to climb the hill and the credit goes to William Keys who was Assistant Revenue Surveyor and an apprentice named Mac Mohan and thus they were the first Englishmen to reach the Nilgiri plateau.

Mr. Sullivan, the then Collector of Coimbatore did some pioneering survey work, and formed the first bridle path to reach the hills from Coimbatore. The idea of Making the Nilgiri a hill station was conceived by Mr. Sullivan, who discovered Ootacamund and delighted by the temperate climate, he built the first bungalow at Ootacamund, for his residence, which is, even today popularly known as the Stone House, and the locality as Stone House Hill.

Finally, the full status of a district was made only in the year 1882 by designating the Commissioner of the district as collector and the Assistant Commissioner became the Head Assistant Collector. The collector was also given the powers of an additional Sessions Judge. The taluk administration came into being with the appointment of a Tahsildar.
The district is divided into two revenue divisions namely, Gudalur and Coonoor, with two taluks under each and a total of forty-five revenue villages. Ootacamund is the headquarters of the district and it is popularly known as the Queen of Hill Stations. For local administration purposes, the district has two Municipalities, one township, four Panchayat Unions, twenty-two town panchayats, and twenty-seven village panchayats.

The district extends over an area of 2,549 sq.kms. and has a population of 630,169 forming 1.30 per cent of the total population of Tamil Nadu. It has a density of 247 persons per sq. km. which is less than the state average of 372 per sq. km. of the six taluks viz., Gudalur, Ootacamund, Kotagiri, Coonoor, Kundah, and Pandhalur. Ootacamund is the largest taluk with a population of 223,014 and Kotagiri is the smallest both in respect of area and population. Kotagiri is a new taluk, formed with effect from 1st May 1978 and it has been bifurcated from the Coonoor taluk. Kundah and Pandhalur are the newly bifurcated taluks from Udhagamandalam, Gudalur respectively.

The district is delimited into three state Assembly Constituencies, viz., Gudalur, Ootacamund, and Coonoor, of which Gudalur Constituency is reserved for Scheduled Castes. The Nilgiri Parliamentary Constituency covers the entire district besides extending over Mettupalayam, Avanashi (S.C) and Thondamuthur Assembly constituencies of Coimbatore district.

There are as many as 23 Police Stations and 5 out posts in the district as on the year 2000 and the strength of police force is 874 of which 267 are armed reserve personal. There are no jails in the district.

**Location and physiography**

Nilgiri means “Blue Mountains”. The entire area of the blue mountains constitute the present district of Nilgiri. The Height of the hills in the Blue Mountain range varies
between 2,280 and 2,290 metres, the highest peak is being Doddabetta at a height of 2,623 metres.

Nilgiri district lies between 11° and 11’ 55’ of north latitude and 76° 13’ and 77’ 2’ of east longitude, with Kerala on the west, the Mysore state on the north and Coimbatore district on the east and south.

The district derives its charm from its natural setting. High above the sea level, situated at the junction of the two ghat ranges of the Sayadri Hills, Nilgiri district provides a fascinating view. The steep hills and fantastically narrow valleys with numerous rivers and rivulets running in all directions with a few fine waterfalls here and there provide a beautiful scenery. The temperate and most equable climate further heightens the attractiveness of the place.

The importance of the district is not confined to its beautiful scenery and climate alone. The rain that falls in this district is of great value and economic importance. The district is drained by numerous streams and the two major rivers that originate from this district are Bhavani in the south and the Moyar in the north. Pykara river after traversing along the border of Ootacamund and Gudalur Taluks joins the river Moyar.

The Kundah river rising in the steep slopes of the Kundah mountain range runs down the hill collecting all the minor streams that rise on the eastern side of the Kundah hills. The river drains the Kundah valley the Nanjanad valley, the beautiful Emerald valley and also a portion of the Ootacamund taluk. The river Mudukadu that drains the orange valley rises in the north east corner of the plateau. The Grathada Halla river rising near the Kotagiri leaps down 250’ at St. Catherine forming a cascade. This is one of the finest and the second highest waterfalls in the district. It then falls into the river Coonoor near Mettupalayam. The Coonoor river which flows down the coonoor ghat is made up of the Coonoor stream and the Kateri stream.
The waters of these rivers have been fruitfully harnessed for the establishment of three hydro-electric project at Pykara, Moyar and Kundah. The high altitudes of the district afford facilities for cultivation of certain crops like potatoes, tea, coffee, vegetables and oranges. The other items also produced here are eucalyptus, cinchona, etc.

Soil

The soil of the district falls under three major types-(1) clay (2) clayey loam and (3) loam with laterite sub-soil. The depth of the soil from 10 to 14 feet. The sub soil is invariably porous.

Rainfall

The rainfall in Nilgiri district is not uniformly distributed and varies considerably from one place to another. The average annual rainfall in the district is 965.84mm. falling on an average, on 74 rainy days in a year.

Climate and Temperature

The high elevation of the district naturally results in a diminished temperature, which is further lowered by the excessive moisture content of the atmosphere resulting from exalation by vegetation. Further being situated not far off from the sea, the highest and western portion of the district come under the influence of the south west monsoon. The Doddabetta range shelters the lowest and eastern parts of the district from the south west monsoon; but these regions are served by the north-east monsoon which sets in some time during October.

The atmosphere is markedly dry during January to March and only by April slight moisture is noticed. The moisture contents is the atmosphere fluctuates and increases considerably under the influence of south-west monsoon winds during Jane- August period. During this period, the atmosphere is surcharged with moisture and consequently heavy showers occur. After August, the moisture content decreases and by December the air once again becomes dry.
Forestry

Nature has bestowed Nilgiri with magnificent forests with varied and colourful plants and animal life. Incidentally, the forests are also the repository of tribal culture. Ootacamund enjoys a salubrious climate. Forest wealth is one of the factors, adding to the natural beauty and economic importance of this district. Nilgiri district has an enormous forest area of considerable value spread over 2549 Sq. km. constituting as much as 56.2 per cent of the district area.

Majority of the trees that grow here are found to be more or less deciduous in character and hence during dry seasons- January to March - these forests have a bare appearance. Forest on the western slopes of 3000’ elevation have fantastically tall trees, which reach an average height of 200’ to 250’. Varieties of trees and plants grow here, but the timber obtained from them are of inferior quality. Noted timbers from these regions are Iron wood (Mesua Perra) red cedar (Acropus Fraximifoli) ebony, etc.

Apart from these, various other plants of different kinds also exist in this district and a number of trees and plants from various parts of the world have been introduced into the region.

The following are the major schemes undertaken in this district:
1. Intensive tree planting.
2. Extensive forestry programme.
3. Hill area development programme.
4. Pulpwood scheme.
5. Western ghat development programme.

Minerals and Mining

The following are the major metallic and non-metallic minerals available in Nilgiri district and used in various industries:
1. Iron ore - Metallic Minerals
2. Bauxite -
3. Magnesite - Non-Metalic Minerals
4. Clay -

Iron ore occurs in the form of Magnesite Quartz in Devala, Illhorai, Kodaperunad, Snowdown, Tellanvedu, Trichagudi, Karudugalai, Masinagudi, Madapad and Adjur of Nilgiris district. The quality of iron ores is supposed to be about 35 to 38 per cent while the reserve in each place are about a lakh tones.

Magnesite Quartz Hematite also occurs in Devala, the quality of which ranges from 35 to 38 per cent and 58 per cent and their reserves are estimated to be around 11 million tones. It can find use in steel industry after magnesite concentration.

Bauxite is a hydrode of Aluminium. It occurs only near Kotagiri of Nilgiri district. The quality of Bauxite here is 40 per cent.

Megnesite is a Carbonate of Magnesium containing 47.6 per cent Magnesia and 52.4 per cent Co 2. The deposit is situated at Tengumaranada in Moyar Valley of the Nilgiri District. Every year about one lakh tonnes of Magnesite are mind in this area and used in the manufacture of refractory bricks.

Clay in the form of China clay (i.e. residual clay) occur in Cherambadi of Nilgiri District. The total reserve of clay here is estimated around 25,000 tonnes.

Electricity and power

As already mentioned, the copious rains in this district feed a good number of steams and rivers, which have been harnessed and three hydro-electric projects established.
1. Pykara Electricity System
2. Moyar Station
3. Kundah Project
Industry

Nilgiri has only a few industries. Perhaps the only industry which is widespread is tea. The tea factories which number about 801 are spread out in the district. The tea leaves plucked from tea bushes are processed and packed in these factories. Manufacture of wooden tea chests is done in these factories as an ancillary. Manufacture of eucalyptus oil is pursued like a cottage industry in a few places in the district.

Another important factory in the public sector is the Hindustan Photo Films manufacturing company located in Indu Nagar, eight kilometers away from Ootacamund – Mysore road. The factory manufactures various types of photographic materials. This plant was commissioned for production early in 1965.

Trade and Commerce

Besides the few manufactured goods mentioned above which are sold outside, the chief articles of trade in the district are tea, coffee, potatoes, vegetables, fruits, timber, eucalyptus oil, wattle bark, garlic and pepper. Coffee is sent to Mettupalayam and Coimbatore for processing, before they are sold to the Coffee Board. The products grown in the district are marketed both at Ootacamund and Mettupalayam which is the receiving centre at the foot of the hills. Vegetables and fruits grown here are also marketed likewise. The chief articles required for the local people here, viz, rice, other food grains, clothing and consumer goods are brought from the plains.

Agriculture

According to the village records the total geographical area of the district is 254,654 hectares. Most of the land holding in Nilgiri district are small.

Irrigation

There are no major sources of irrigation in this district. Except for a small area of about 240 hectares in Thengumarada, at the foot of the gats the district depends on rain for cultivation.
Cropping pattern

The cropping pattern is adjusted to the two rainy seasons occurring in the district. The main season is during the South-West Monsoon from June to September. The rainfall during this season is heavy on the western parts of the district and in Gudalur taluk. The North-West Monsoon is active during the period October-November and is strong in parts, east of the Doddabetta range.

The bulk of the cultivable area is covered by the plantation crop of tea and coffee. Among the annually cultivated crops, potato ranks first. Paddy is grown mostly in the swampy low lands which are depressions between the numerous little hills in Gudalur taluk and also in a stretch of about 130 hectares in Thengumarada. The total extent covered by potato is 7,888 hectares, while that of paddy is 3,815 hectares only. Ragi and samai are grown in dry lands adjacent to paddy field in Gudalur taluk and in some places in Oodacamund and Coonoor taluks. Samba wheat and barley are grown in small extents in Coonoor and Ootacamund taluks. The area covered by all these cereals is 3,817 hectares, while those of the pulses is 3,821 hectares. Fruits trees and vegetables of the cold climate are grown in Kotagiri area of Coonoor Taluk and to the extent of 117 hectares, including root crops.

There are five State Seed Farms in this district for the multiplication and distribution of potato seeds. There is an agricultural research station in Nanjanad where research on potato is conducted.

Cinchona Cultivation

The experimental planting of cinchona started at Doddabetta in 1860 was gradually developed into Government Cinchona Plantation and the cultivation of the crop has been extended in and around Naduvattam. A quinine factory was started at Naduvattam in Nilgiri district in 1871, which manufactures quinine and other derivatives from the bark obtained from the cinchona trees.
Animal Husbandry

There is a District Livestock Farm at Nilgiri, where the exotic breeds of Friesian, Jersey Crosses, Red Dane Crosses are maintained. One small progeny unit is also functioning in this farm. A poultry extension centre is located at Masinagudi.

Hill Area Development Programme is implemented in this District. Under this programme, a sheep breeding Co-operative society has been formed and 415 Field sheep units and 40 Piggery units have been established.

Fisheries

Nilgiri is an undulating plateau with a minimum height of 750 meters and a maximum of 2,580 meters. Water sources are mainly hill streams and small rivers. The indigenous fishery of these waters is minnows and other uneconomic species. When this area gained importance as a summer resort and tourist attraction, game fishes like trout were introduced in these waters.

Efforts to introduce the gamefish, the trout in the hill streams of the Nilgiri were made as early as 1863 by Dr. Francis Day by importing eyed ova of the fish from New Zealand. The present establishment of trout fisheries in Nilgiri waters is due to the pioneering efforts of Henry C. Wilson, the then pisciculture expert of the Government of Madras in 1906. He started the Trout Hatchery on a scientific basis. He surveyed the possible localities in the district and selected Avalanche stream about 30 kms., from Ootacamund as the most suitable location for a Hatchery. The Avalanche hatchery was constructed in 1907 and the first batch of eyed ova, brought from New Zealand was hatched out successfully and for the first time the trout were introduced in all the streams in higher elevations.

Transport and communication Roads

Nilgiri district has a good net work of roads running in all directions connecting various centres of importance in the region. Numerous ghat roads from the backbone of
the district’s transport and communication system. The Kotagiri ghat road connecting Mettupalayam was the first to be opened for traffic. The Coonoor Ghat road runs from Mettupalayam to Coonoor. This forms the main communication line to Ootacamund from the plains. The Sigur Ghat road starts from the northern crest of the plateau and passes through Masinagudi and Teppakadu and joins the Gudalur Mysore road. Another ghat road begins from Ootacamund and goes upto Avalanche. The road to Kundah has recently been well developed and this has been extended further to Kundah power house No. II at Perumbahalla and from there to Karamadai in Coimbatore District. Naduvattam and Gudalur are connected by the Gudalur Ghat road. The road to Mysore beyond Gudalur passing through Mudumalai Wild Life Sanctuary serves as the main communication line to Mysore. Access to Kozhikode on the west can be had from Gudalur by a State Highway passing through Cherambadi which is the western most village in the district.

**Railways**

The only railway that exists in the district is from Mettupalayam in Coimbatore district to Ootacamund extending over a distance of 46 kms. Out of this, a distance of 8 kms. is in the plains and the rest in ghat section. There are 11 railway stations in the district and the two taluks, viz. Coonoor and Ootacamund are connected by rail.

**Transport**

There has been a considerable increase in the transport facilities in the recent decades. Most of the bus routes in Nilgiri district are operated by the State Government.

The are more than one hundred bus routes operated in this district. Inter-state bus services are also easily available from Ootacamund to Calicut and Mysore.

**Post and Telegraph**

The Nilgiri district is connected by a net-work of Post and Telegraph Offices and Telephone connections. Almost all parts in this district are connected by Telephone. In all, there are 164 post offices in Nilgiri district, including 102 sub-post offices as on 31st
March 1981. There are two head post offices, one at Ootacamund another at Coonoor and besides there are 40 Post and Telegraph Sub-offices. There are also several experimental and temporary post offices, functioning in the district.

**Temples**

There are as many as 33 temples in this hilly district of which 27 are under the administrative control of the Hindu Religious and Charitable Endowments Administration Department, While the remaining are private ones. Of these, 4 are Siva temples, 6 are Vishnu temples, 4 others are Murugan temples, 10 are dedicated to Goddesses and the remaining 9 temples are for Vinayaka and others deities.

Of these temples the Ponneri temple at Nelliyalam, Sri Mahalingaswamy temple at Melur and Sri Ethiaiamman temple at Nadugula are the ancient and most prominent shrines of the district.

**Tribal worship**

Nilgiri is the abode of many interesting tribes and the prominent of them are Todas, Kotas, Kurumbas, Irulas, Mulla Kurumbas and Paniyas. With the exception of Todas and Kotas, all the other tribes have no temples of their own. Mulla Kurumbars and Paniyans are found only in Gudalur taluk and they generally worship at Hindu temples. Irula and Kurumbars worship the village deity Kuruppida and Goddess Thanduna Mari, for whom no temples are constructed. They generally perform their Pujas once a year under a big tree near their settlements.

The most ancient and sacred place of worship of Todas is called ‘Pho’ in their language, which is located at Muthunad Mund in Ootacamund taluk. This famous and reputed ‘Pho’ is circular shape of a height of above 4’ feet with walls made of granite slabs all round. Its roof, conical in shape and 20’ feet high is made of dry grass. There are no idols in the prayer room. A peculiar feature in the ‘Pho’ (temple) of the Todas is that except a lamp lit wit ghee prepared from buffalo milk, nothing else like breaking of coconut is observed during pooja.
The ‘Kotas’ are a class of artisans skilled in blacksmithy and carpentry and they are worshippers of ‘Tools and implements’ and their chief deity is a set of tools and implements. Their God is ‘Labour’ and their form of worship is the same irrespective of location. Their temples is known as “Ayinor Gudi” in their languages and the most important Ayinor Gudi is in Kotta Ma’dhan at Kottagiri in Coonoor taluk, adjacent to the bus stand. The bow and arrow are kept as a memory of their past mode of living, i.e., by hunting. Their common name for the God and Goddess is “Kambatta Raya”.

Place of Tourist Importance

The Nilgiri, the most popular hill resort of the south has a number of tourist attractions, which chiefly include Botanical Garden, Lake, Doddabetta, Mukurti Peak, the Pykara Dam and Sprawling tea plantations. Luxury hotels and economy guest houses are available besides the Tamil Nadu Tourism Development Corporation’s Hotel “Rajarajan”.

Botanical Garden was established in 1847 by Marquis of Tweeddale. A variety of exotic and ornamental plants adorn this garden. The research scholars and students of botany from far and near come to this garden. Just below the mini lake, a fossil tree trunk can be seen, which is said to be 20 million years old. The annual flower show organized by the Government and the Dog Show of South Indian Kennel Club held usually in May every year are major attractions.

The artificial lake here was constructed in 1824 by Mr. Sullivan. Pony rides near the lake is a recreation most sought after by children. The lake garden is an added attraction.

Doddabetta is the highest peak (2,623 mts.) in the Nilgiri and offers beautiful vistas of the hill ranges, plateaus and plains around. It is 10 Kms. from Ootacamund. There is a good motorable road to reach the peak.
Mudumalai, one of the major wild life sanctuaries is 67 kilometers from Ootacamund on the way to Mysore, via Gudalur, located at an height of 1,000 metres and extends over an area of 323 Sq.kms. Herds of elephants and bisons are very commonly seen here. One of the most primitive mammals in this sanctuary is the ant-eater or pangolin.