1 TYPE 1 FIELDWORK – DESCRIPTIVE STUDY

The Western Ghats mountain system has been geologically stable for a long period of time, since about the late Jurassic when India separated from the super-continent Gondwanaland and collided with the Asiatic plate. The stresses and strains in the crust of peninsular India, along with isostatic forces, resulted in the horizontal and vertical dislocation of part of the landmass. This led to the formation of the Western Ghats. This range along the western coast of South India is almost unbroken for 1600 km except for the 25 km wide discontinuity at the Palghat Gap. Due to its past position in Gondwana land and its current position close to the Equator, the Western Ghats ecosystems are genetically very rich. In addition, due to their somewhat isolated nature (ocean on one side, arid areas to the others), there are high rates of endemism in both plant and animal groups. The Gurukula Botanical Sanctuary, GBS, is within the Western Ghat mountain system. The Sanctuary consists of 40 acres of land with a variety of land uses. In this field work study I am looking at the Sanctuary and it's neighbourhood. The area of study covers around 100 sq. kilometers, including a range of land use patterns as well as part of an old growth State Forest Reserve. The study is a description of the region including both the physical and the human aspects.

1.1 Physical Geography

1.1.1 The Area

Area of Study : 10km X 10km around Gurukula Botanical Sanctuary
Administrative district details: Village of Peria
Panchayat of Thavinjal
Taluk of Mananthavady
District of Wayanad
State of Kerala
India
See Appendix 1Map 1 (Location map)

1.1.2 Topography and Rivers

The Wayanad District is on the Eastern edge of the Deccan Plateau. The entire area is considered to be very picturesque and it includes some of the highest mountains in the region, the highest being 2200 m above sea level. There are ranges of low hills with gentle slopes in the central part of the plateau with open and flat areas on the eastern side. In general the whole area has low ridges and numerous valleys in all directions. The eastern part is under heavy forest. Average height of the plateau is 700-800 m above sea level. Important rivers of the area are: Kabini, which starts in the western Ghats. It is joined by many smaller streams and it drains the whole of north and south Wayanad. Cholayar is one of the tributaries of the Baypore river. The Mananthavadi puzha (river), starts between the Banasur peak, the Kuttiyadi range and the Periya pass.
See Appendix 1Map 2&3 (Contour map& Rivers and streams)

1.1.3 Geology

Kerala state is on the south-western edge of the Indian peninsula. It has unique environmental characteristics due to its location and topography. The landmass is mainly made up of gneisses and

charnochites schists. Some of the exposed gneisses are around 2500 million years old. The Wayanad plateau is east sloping and of medium elevation. It is a gently undulating plain abruptly descending to the coast on the west and merging with the Mysore plateau on the east side. According the Manual of Geology (1950) "the gneiss is soft and highly decomposed, well foliated and garnetiferous. Full of fissures and faults" and "the quartz of the gneiss is usually clear and granular, occasionally clouded" and, " charnockite rocks said to penetrate the gneiss, seen frequently crossing the foliation plain", "pegmatic veins common throughout Wayanad" and "gold bearing quartz reefs occur".

1.1.4 Climate

The area falls under the humid tropical climatic region. It is relatively cool, being 3000 to 4000 feet above sea level. From October to January, the climate is fairly dry and cool. From February to May it is hot and windy. June to October are the monsoon months. The South West summer monsoon is dominant, rainfall is usually between 3000-5000mm. Sometimes, up to 250mm of rain can fall in one day. The coldest season corresponds to the dry season, between December and February. Mean annual temperature range is 12 to 35 C.
See Appendix 1 Graph 1 &Table 1

1.1.5 Soils and Soil Erosion

Soils in the study area and the region are heterogenous. Most of them are very old and intensively processed and they appear to be deep and fairly uniform. They have a slightly darkened top soil horizon because of the accumulation of organic matter. The subsoil is reddish or yellowish throughout. In these soils the process of weathering has gone so far that only few original rock minerals remain in the upper horizons. Mostly, the secondary clay minerals are also weathered. They include – free oxides and hydroxides of iron, aluminum and manganese. And all these together are called sesquioxides. The ferric sesquioxides give the soils their colour. The soil has been subject to intensive leaching and so is nutrient poor. Organic matter is rapidly cycled through. These soils often have open porous structures and water infiltrates rapidly at the surface and percolates freely through profile.

Soil in the cultivated valleys is fine, rich and brown. Higher up it becomes red and is mixed with gravel. In forested areas it is richer from accumulated organic matter.Classification of these soils has been a problematic area for taxonomists. Systems of classification are now being developed based on the clay fraction.

The hill slopes of the area have moderately deep to deep, gravelly clay loam to clay soils developed over gneissic parent material. In the major portion of the watershed, the soil is only moderately deep (75-100 cm), as the topsoil has been eroded due to intensive cultivation without proper soil conservation measures. As the soils have lost most of the organic layer, their productivity has been considerably reduced. The lower footslopes have gravelly sandy clay loam to gravelly clay soils. They have developed over the colluvium brought down from the hill slopes. These soils are deep, 100-150 cm. They are comparatively poor in their fertility due to the washing away of nutrients by the heavy rain lashing this area coupled with inadequate soil conservation measures. The valley portions that constitute the paddy lands have very deep soils, greater than 150 cms that have developed over alluvio-colluvium. These soils are mostly sandy clay loam to clay in texture. They are relatively fertile soils but excessive exploitation under banana and vegetable cultivation and without sound crop management practices is making these soils less productive.
See Facing Page Photographs 1&2

One of the main problems in the area is soil erosion since the area receives an annual rainfall of 4000 – 4500mm, distributed over 7-8 months. The cultivation of annuals as well as perennials on the steeply sloping lands of the hills without adequate soil conservation measures and the high rainfall have resulted in heavy soil losses. This is evident from the moderate depth and stony surface of the soils. The tendency to cultivate ginger along the slope has encouraged soil loss. The financial assistance by the Tea Board for cultivation of tea encourages the farmers to clear fell all the trees and make the area free of all vegetation cover, leading to heavy erosion of soils in the first years of planting.
See Facing Page Photograph 3

1.1.6. Natural Vegetation

The natural vegetation of the region is classified as Medium Elevation Wet Evergreen Tropical Forest, Pascal J.P. and is characterized by tall trees with dense undergrowth, rarely penetrated by the sun. Valuable trees of this forest are rosewood, black dammer, wild jack, mango and iron wood. There is high diversity, with over a 100 species of trees alone recorded on the old growth forest in the GBS lands. Being a wet area, there are large numbers of epiphytes, ferns and woody lianas. Diversity of other forms of life is also very high and includes birds, reptiles, amphibians and arthropods.

The Wayanad district was once completely covered by dense forests of multitudinous types, ranging from evergreen to deciduous and subtropical montane. However, since the 1850s, most of these have been gradually converted to plantations, first by the British colonists and subsequently by Indian settlers. The forest types vary along an east west gradient, as maximum rain falls on the western edge and sharply decreases towards the east.

1.1.7 Land Use

The area of study is a combination of different land use patterns. It includes part of a 7000 hectare State owned Reserve Forest. This is in fairly good condition except for some patches of eucalyptus and acacia plantations. The rest of the study area is under: large cast crop plantations (tea, coffee, rubber and pepper), small mixed traditional farms, fields with paddy, banana and areca nut.
See Appendix 1 Map 4 (Land use and Vegetation map) ,Facing Page Photograph 4

1.2 Human Geography

1.2.1 People of the Area

The area of study is home to people of different castes and religions. The majority of them are settlers who have in from the south in the last 50 years. The tribals are the people who have traditionally lived in the forests. The Wayanad District has been home to 13 tribes, who have been here since many centuries. However, in the study area 2 tribes are found,the Kurchians and the Paniyas. The Nairs are the upper caste land owners. The population also includes muslims and Christians.
(Description from Gopalan Nair's 1911 Malabar series "Wynad – Its Peoples and Traditions")

Nairs – "Upper Caste" who came as settlers from the plains are one of the first migrant groups from outside to enter Wayanad. They were brought by the Raja of Kottayam and given plots of land to settle in. The plots of land were in fact large acreages. The Nairs were traditionally warriors. They observed matrilineal property rights. After independence, in 1969, with Land reforms being enforced in Kerala, their large properties were parceled out to poor migrants from the coast.
Much of the farmlands, including GBS's, have been owned previously by Nairs. There are still Nair families in the neighbourhood, albeit without their former status.
Kurchiyans – they have the highest position among all the hill tribes and are skilled in archery. The Raja of Kottayam brought them to Wayanad to fight against the Vedar or hunter kings. When the battle was over they wanted to return but were unable to because they were not accepted back home, since they were now "polluted" by contact with other tribes. As a consequence they settled in the hilly parts of Wayanad. Apparently, 140 families settled. They worship the hunter form of Lord Shiva. They are cultivators, growing paddy in the wetlands and ragi (finger millet) in the hills. They also hunt.

Paniyas – Said to be the most characteristic representatives of the Dravidian race but now increasingly mixed with Aryan and Mongoloid races. There is a belief that they are descendants of Negroes brought to Malabar coast during trade in ancient times. They have dark skin and curly hair, and work mainly as agricultural labours. Legend is that their original home was "Ipimala" and that they were savage and wild forest dwellers, who would venture into cultivated areas by night. It is said that they were lured and captured by the smell of cooked food (as they didn't use fire) by landlords and then subjugated to work in their fields. They pray to Kali. They now have an important role to play as labourers in cultivation. They still have a migratory nature and may just leave if dissatisfied.

1.2.2 Produce

The major crops grown in the region are pepper and coffee, which is cultivated by more than 80% of the farmers. Areca nut is the other preferred crop which is cultivated by 65% of the farming community. In addition rubber, cashew and ginger are grown in the area. Most of the farms have adopted mixed cropping patterns with coffee, pepper and coconut on the hill slopes and valley fringes. At present the farmers are showing a tendency to switch over to tea cultivation since coffee is not ensuring them good financial returns. The valley fringes adjoining the paddy lands as well as the valley portions that constitute paddy lands are now increasingly being cropped with areca nut and banana, as well as bitter gourd in the dry season. Paddy land, though extensive is not being used for paddy cultivation due to various factors, the prime reason being increased cultivation expenses and lack of labour at the appropriate time for various agricultural operations. Whereas up to 10 years ago, paddy had been the dominant crop of the fields, with many varieties being grown, it is now almost completely replaced by banana and bitter gourd as these are found to be more economical. They yield more cash

for lower input of labour, and the fact that they are exported to other regions in the state. Though this area is conducive for growing all the cool season vegetables, farmers are reluctant to take up the cultivation of these, for lack of adequate financial returns and poor market facilities.

There is no market place in the area. Farmers are at the mercy of middlemen who make a large profit on the produce, as the people have to depend on the Mananthavady market 25 km away. This, as well as the lack of cheap transportation contribute to low financial returns.

The secondary source of income is animal husbandry. 50% of the people have milch animals, of which 86% are cross-bred and 14% are indigenous species. Average milk yield of indigenous cows is 2 to 3 litres and that of the cross breed is 5 to 6 litres. The milk is used at home, sold locally or at the co-operative milk union. The availability of grass and the need for manure are the factors that prompt them to keep the animals. In addition, 50% of the farmers also have goats, pigs or fowl.

1.2.3 Settlement

The pattern of settlement is very scattered and the structure of the village cannot be clearly seen. The area is divided into villages for administrative purposes, however the boundaries between one village and the next are not physically visible at all. This is true for all of Kerala. Houses are scattered all over the landscape, surrounded by farms and orchards, often on the lower part of the hills, overlooking the paddy fields, which allows for greater protection of crops from wild boar and elephants. Perhaps, the fact that homes have independent supplies of water, facilitates this scattered pattern of settlement. The area though quite densely populated and intensively used, gives an impression of space due to the lack of agglomeration.

1.2.4 Housing style

All traditional houses have steeply sloping roofs, which are necessary during the heavy rains of the monsoon. Houses are surrounded on three, or all four sides by a wide courtyard which is used for drying and sunning. The courtyards are cut out of the hillside and the houses usually built on raised platforms, to avoid moisture seeping from below. Older houses are made of mud and cowdung, and have thatch roofs. Now, however, houses are increasingly being built with bricks, cement and concrete, with tiled roofs.

1.2.5. Transport

One long distance road goes through the area from Tellechery & Cannanore north Wayanad to Mysore. It climbs up from the plains of Malabar, some 700 metres, up the “Ghat” or escarpment to the plateau area of Wayanad. This road is the connection between the study area to the nearest town and market, Mananthavadi – 25kms away. Apart from this the area has, one smaller metalled road, several mudroads and footpaths. Frequent buses run only on the main road. There is a service through the metalled road – to the village of Alattil, once a day. And jeeps run on the local mud roads. Local people commuting within the area generally walk. Houses and farms/orchards are connected by footpaths.
See Appendix 1 Map 5.

1.2.6 Water

In the study area water is not scarce. Most of the valleys have natural springs with potable drinking water. There is no piped system. Each house has its own well or tank as subsoil water levels are quite high. Traditionally, irrigation was not necessary as the valley fields were perennially wet and crops grown on the hill slopes were monsoon fed or hardy. The local river is also a water source for many farms. More recently, with improved economy and subsidies available for certain crops, farmers have resorted small irrigation technologies – with pumpsets and sprinklers, which allows them to grow irrigation requiring crops.

1.2.7 Electricity

Until 1999 there was only one power grid along the main road. Most households used kerosene lamps for lighting. With the Governments schemes "Electricity for Every Village" power lines were brought in to the more remote valleys. However, GBS is not connected to the mainline – and has instead opted for solar panels.

1.2.8 Communication

The Telephone lines are also relatively new. Until 1997 the nearest phone was in Mananthavadi. Then Periya got a radiophone. And only in 1999, was the area connected to the telephone network and hundreds of houses are now connected. The nearest post office is in Alattil, 3 km from the central point of the study area. Periya village also has a post office. This has been in existence for a long time, with one postman who had to cover 100sqkm by foot.

1.2.9 Health

There are traditional healers and midwives in the area but for modern facilities the patients have to travel to Mananthavadi.

1.2.10 Education

.

Kerala is a state with 98% literacy, which means that all children go to school. Education is almost entirely state sponsored. The study area has one primary school and one lower secondary school.

1.3 Conclusion

The area of study is essentially rural and includes a part of the State Forest Reserve. Most of the population are farmers and the rest travel to the town for work.The land is intensively used, the valley bottoms for paddy and banana, the slopes for tea or plantations of fruit trees and coffee. People in the area lead a traditional and relatively simple lifestyle. A family might own a few acres of land or even less and a typical farm would include some land under paddy, mixed orchards, and more recently tea plantation. There appears to be little attention paid to the consequences of soil erosion, use of chemical pesticides and fertilizers, and the increasing areas being cleared for planting tea. People make use of the forest resources for firewood, hunting and medicine. However, the area is changing, with the coming in of electricity, telephones and becoming more accessible to vehicles. Change can be seen in the jobs the younger people chose to do and the cash oriented farming methods, as well as mechanization. For a region that was cleared and settled only around fifty years ago, the changes and developments are extremely significant. One cannot imagine that the same landscape that is now settled and mainly agricultural, was until very recently a continuation of the Reserve Forest. People still have memories of the area being a wild and difficult place to live in.
There are no detailed maps of the area. I was able to use one topographical map, published by the Government of India in 1970 for the river and contour patterns. The other information has been gathered from people and observations from walking in the area of study. I also got some information from the Alattil Watershed Development Programme working in the area. There are a couple of books on the District of Wayanad which have some references to the area. Generally the area is poorly documented in terns of human and physical geography. I would be very interested in learning more about the region. This study has been challenging and a great learning experience for me.

Bibliography

Nair, C. Gopalan. *Wynad, Its Peoples and Traditions*. Malabar series.
The Geological Survey of India. 1950. *A Manual of the Geology of India and Burma.*
Logan, William. *Malabar* (vols. 1&2).
Pascal, J.P. *Wet Evergreen Forests of the Western Ghats of India.*
Nair, Satish Chandra. *The Southern Western Ghats – A Biodiversity Conservation Plan.*