Chapter Four

DESCRIPTION OF CAMERON HIGHLANDS

Chapter 4.0 Description of Cameron Highlands

4.1 Historical Development of CH

CH is located between 101°21' East to 101°35' East and 4°19' North to 4°37' North, and is a part of the main range of Peninsular Malaysia (**Fig. 4.1.1**). It is located remotely from major townships and the transportation network of the peninsular. In 1885, William Cameron, a British government surveyor, discovered CH (Abdul Kadir, 1986). While on an expedition into the main range, he reported of coming across "a fine plateau with gentle slopes, shut in by loftier mountains". The discovery stirred excitement and interest in the colonial government that looked upon the highlands to provide a substitute of temperate environment for the European communities. In the year 1888, the then Resident of Perak, Sir Hugh Low, proposed to build the highlands as a sanatorium, health resort and farmland.

Subsequently, a few surveys were performed to explore the surrounding areas. A bridle path was constructed from Tapah town. In 1925, Sir George Maxwell visited the highlands and decided to develop it into a hill station. A development committee was then formed, which functioned until 1931. During this period, an access road was constructed using Chinese and Indian labors. Wealthy residents and government officials from Perak began to build retreats at the highlands. A permanent British army base was also established soon after that.

Climate in CH is very conducive for the planting of temperate vegetables. Thus, farming became the main activity to supply fresh vegetable to the European communities. Chinese farmers became the dominant ethnic farmers. However, the development and built up area was relatively small and scattered.

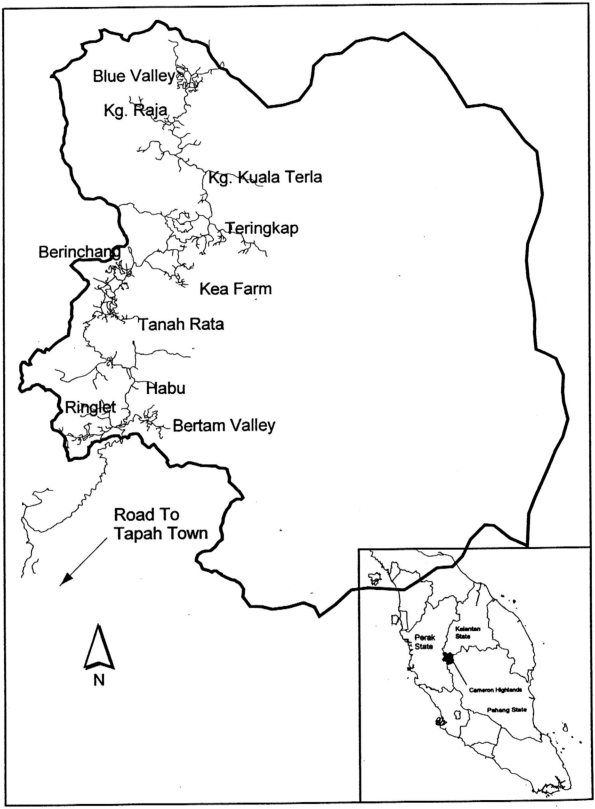

Fig. 4.1.1: The Location, Settlements and Road Networks of Cameron Highlands

Source: Modified from UM and TNBR (2001)

The biggest changes to the highlands came in 1929 when John Archibald Russell, the son of a British administrative officer started a tea plantation, the BOH Tea Estate. Huge area of the forest was cleared in order to plant tea. Since then, CH is firmly established as a hill resort and for tea plantation and vegetable cultivation.

During the Second World War, Japanese invader set up administration center in the highlands to secure fresh vegetable supply to their troops stationed throughout the peninsular. In 1948, a state of emergency was declared because of communist insurgencies. Curfew was enforced which restricted private vehicles from using the road from Ringlet to Tapah. After independence from the British in 1957, the state of emergency was lifted in 1960 (UM and TNBR, 2001). Since then, development is fast encroaching into the hearth of the upland forest in the main range surrounding CH.

4.2 Physical Characteristics of CH

CH is located within a hilly to mountainous terrain that forms in part the main drainage divide of Peninsular Malaysia into the East and the West Coasts. CH is the smallest district in the State of Pahang Darul Makmur, with a total area of 71,218 ha. Located on the Main Range of Peninsular Malaysia, the altitude of CH is at 1, 070 m to 2, 110 m above mean sea level. The highest peak is Gunung Irau.

The vegetation of CH varies with the increase in altitude. The altitudinal zonation characteristics of forest in Malaysia are mainly due to reduced surface temperature and increase in moisture. Upper Dipterocarp Forest of Wyatt-Smith is found at Ringlet, that is at about 750 m to 1, 200 m above mean sea level. The tree canopies are about 30 m tall. As the altitude increased to about 1, 100-m to 1, 700-m, the vegetation changes to

the Upper Montane Forest. This is found in the Tanah Rata and Berinchang areas. The species composition includes a large number of trees from the Fagaceae (Oak) and Lauraceae (Laurel) families. The forest canopy is characterized as low, reaching only 18 m high. At exposed ridges, the vegetation becomes mostly of the Montane Ericaceous Forest. At the cloud level, the trees tend to be dwarfed and grow to about 10 m tall only. There are large numbers of mosses, liverworts, fern, rhododendrons and vacciniums families.

4.2.1 Climate

The Asian Monsoon system plays a dominant role in the climate of Southeast Asia, with the Indian Ocean and the warm pool in the west Pacific Ocean provide warm and humid air over this marine region. Due to the higher altitude, CH experiences lower surface air temperature than the humid tropical lowland of the Peninsular Malaysia. Thus, CH is characterized by mild tropical highland climate with abundant rainfall throughout the year.

The rainfall in Peninsular Malaysia is uniformly high through the year. There is no alternation of dry and wet seasons. Heavy rainfall may be experienced anywhere and at any time of the year. Whilst short dry spells may occur, they are not sufficiently long and regular in their occurrences to warrant being called dry seasons (Dale 1959).

Nevertheless, the rainfall of Peninsular Malaysia has a seasonal rhythm. The dominant climatic element on the rainfall of Peninsula Malaysia is the wind. Changes in the direction and speed of the airstreams that cross the Peninsular Malaysia are responsible for the division of the year into four seasons. Firstly, the northeast monsoon, when the airstreams from the northeast sweep over the country prevail from November or early

December until March. Secondly, the northeast monsoon is followed by an inter-monsoonal or transitional season of five to seven weeks' duration. This coincides approximately with the month of April. During this short period, the winds are weak and variable. The third season starts in May when the southwesterly winds from the Indian Ocean advance across the northern peninsular. This trade wind persists until September and is then followed by the second transitional period.

The general pattern of these wind seasons is reflected in the rainfall regime. However, the relationship varies from place to place due to changes in latitude and local conditions. There might be one or two maximum rainfall periods, which falls in different seasons. The rainfall regime is also affected by the principle kind of rainfall that occurs in the region, especially where the local conditions favor a particular kind of rainfall. Three main processes are responsible for different types of rainfall derived as the following:

1) The two airstreams that crossed the neighboring tropical seas are warm and moist, and are conditionally unstable so that only a slight uplift is necessary to produce condensation and precipitation. As the monsoon approaches the mountain regions of Peninsular, the uplift will produce heavy and extensive *orographic* rainfall.

2) There are a number of airstreams from various regions, coming from different directions and flow across the Peninsular. Two or more airstreams will converge and form surfaces of discontinuity or airstream boundaries where they meet. The convergence leads to up-currents and cloud development, leading to the formation of large-scale rain known as the boundary rain. This kind of rainfall is accompanied by the onset of a monsoon where there is a slow movement of the boundary between the advancing and retreating winds.

3) Convectional over-turning is an important process in the equator region where there are differential heating and cooling of the earth's surface beneath unstable equatorial air. This is responsible for the heavy and frequent occurrence of convectional or instability rain. With the formation of a single cumulonimbus cloud, it can produce rain over a small areal extent and lasts for short periods of between one to six hours. This is a local phenomenon rather than a regional one.

CH is located on the east of the chain of the highest mountain in the main range. The distribution of rainfall shows two maximums and two minimums in a year. Due to the sheltering effect of the mountains in Sumatra and the main range itself, the intensities of rainfall during the southwest monsoon is reduced. The sheltering effect of the northeast monsoon by Gunung Tahan range is also giving the same effect (**Fig. 4.2.1**).

The maximum rainfall occurs during the transitional seasons of April/May and October/November. The October/November maximum is usually the larger. The mean monthly rainfall for the period of 1948 to 1997 is about 300 mm in October/November. For the same period, mean monthly rainfall for April/May is about 260 mm (**Fig. 4.2.2 & Fig. 4.2.3**). January/February is the driest month (110 mm) and June (140 mm) is the second driest. However, the northeast monsoon brings more rain than the southwest monsoon, and a dry spell hardly lasts for a month.

Monthly rainfall shows high variability during the dry months (64%) and low variability during the wet months (30%). This indicated more consistent rainfall during the wet months. There is a high possibility of rainfall much less or much more than the long-

term monthly mean value during the dry months. The average annual rainfall was about 2,350 mm, with a normally 12% variation from year to year.

The air temperature is more or less uniform throughout the year. The daily temperature experienced by CH fluctuates between 27.4°C during daytime and 13.5°C during nighttime, based on the 1998 Annual Report of Malaysia Meteorological Department. The mean daily temperature falls between 18 to 20°C. The mean maximum temperature is between 22 to 23°C, and the mean minimum temperature is 14 to 16°C.

The relative humidity in CH is high. The mean relative humidity for 1990's was about 90%, with about $\pm$ 2% fluctuation. **Fig. 4.2.4** shows the typical 24 hours relative humidity and temperature in CH. The average daily sunshine hours vary from 4 - 6 hours in CH. The months with the longest hours of sunshine are February and March whereas the least hours of sunshine are in November and December. This is due to increased cloudiness in the area.

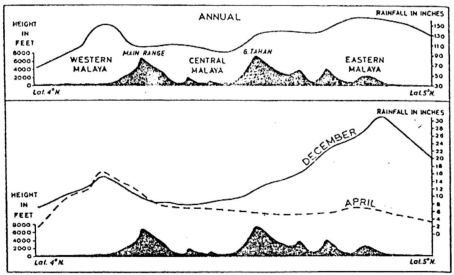

Fig. 4.2.1 The Relation of Rainfall to Configuration in Northern Malaya
Source: (Dale, 1959)

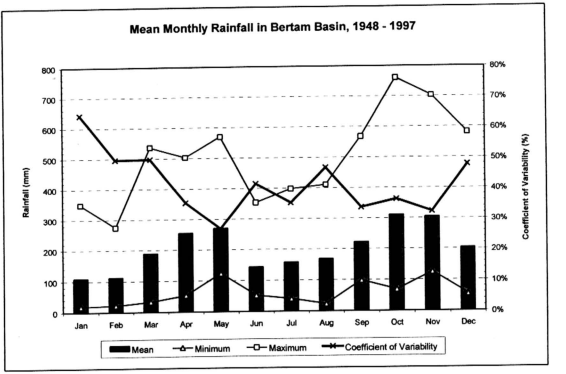

Fig. 4.2.2. Mean Monthly Rainfall and Coefficient of Variability (in %) in Bertam Basin from the Year 1948 to 1997.

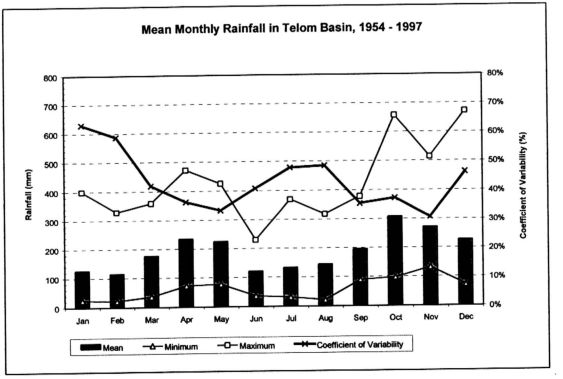

Fig. 4.2.3. Mean Monthly Rainfall and Coefficient of Variability (in %) in Telom Basin from the Year 1954 to 1997.

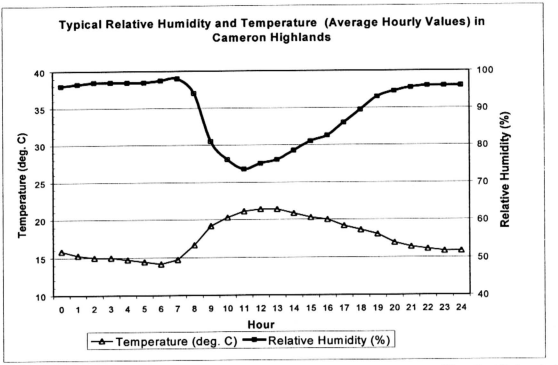

Fig. 4.2.4: Typical Relative Humidity and Temperature (Average Hourly Values) in Cameron Highlands

Source: Central Electricity Board, Federation of Malaya, Autographic Records, 1951.

4.2.2 Relief and Drainage

The CH region forms part of the Upper Telom River basin. The region is bounded in the north from the Berok River basin in Kelantan. Amongst the highest points are Gunung Swettenham (1,961 m) and Gunung Tangga (2,015 m). Kinta and Kampar River basin are bordering the west of CH, with the highest points at Gunung Berinchang (2,031 m) and Gunung Irau (2,110 m). To the south lies the Jor River, and Batang Padang River basins, with Gunung Berembun (2,076 m) as the highest peak.

In this study, attention is focused within the hydroelectric catchment in CH. **Fig.4.2.5** shows the hydroelectric catchment boundary in the administrative district of CH. The hydroelectric catchment is the entire water catchment areas in CH that contribute to the hydroelectric scheme. It is a combination of a few smaller catchments of different rivers

that due to the result of river diversion are supplying water for power generation. The topography map of CH with a contour of 20m interval was used to identify the catchments boundary. The hydroelectric catchment is divided into three sub-catchments, namely Upper Telom, Upper Bertam and Lower Bertam Catchment.

Upper Telom River and Bertam River are the main drainage system of the hydroelectric catchment. Within the Bertam catchments, the undulating and hilly relief varies between 1,080 m to approximately 1,900 m above mean sea level. The lower points are areas around the Ringlet Reservoir. The topography increases towards the Telom catchment (1,960 m) but drops in the vicinity of Kampung Raja (1,220 m).

The natural ground slopes of areas located between 300 and 1,600 m are generally steep, i.e. between 20° and 30°. These slopes are convex-like and steep-sided with narrow valleys in between. However, several broad valleys are also present in the towns of Tanah Rata, Berinchang and Kampung Raja. At elevations exceeding 1,600 m, there have very steep ground slopes that range from 30° to 45° (Paramananthan, 1977).

The analyses carried out by UM and TNBR (2001) showed that the drainage patterns are basically dendritic, but the main channels of major tributaries are much more elongated in nature, suggesting some form of structural controls. Structural controls, with sharp angular bends, could also be seen along the upper and lower stretches of the Telom River and the upper stretches of the Bertam River. The main tributaries of Telom River in the Telom catchment are Terla, Kial, Wi and Misung. The important streams draining into Bertam River are Ringlet, Cheko and Mensu. **Fig. 4.2.5** also shows the major river systems in CH.

The valleys of Upper Telom River and Bertam River and their tributaries are generally narrow and slender and shows slight to moderate sinuosity. There are mostly very steep valleyside slopes where the average gradient is more than 45° (UM and TNBR, 2001). In general, the soils are Rengam series with texture varying from sandy clay to sandy clay loam. Besides certain stretches of the Bertam River and Upper Telom River, moderate accumulation of alluvial materials are found, which are mainly sandy loam with plenty of mica flakes. On some valleyside slopes outcrops of granite are quite common suggesting the intense weathering and mass wasting processes on the slopes. At elevation above 1,500 m, highland peat and spodosols are widespread (Ko *et. al.*, 1987). However, the valleyside slopes are generally stable when there are thick vegetation covers.

Based on the Strahler's classification of stream ordering, approximately 78% of the streams in the Upper Telom and Bertam catchments are of the first order and 17% to 18% are of the second order. The analysis also indicated that the Upper Telom and Bertam catchments are in order six and they bear significant amount of water. The total stream lengths within the Upper Telom and Bertam catchment are 407.85 km and 309.53 km respectively (UM and TNBR, 2001). **Table 4.2.1** showed the morphological characteristics of Upper Telom River and Bertam River catchments.

Table 4.2.1

The Morphological Characteristics of Upper Telom and Bertam River.

Source: (UM and TNBR, 2001)

Description	Upper Telom	Bertam
Area of Basin (km^2)	100.6	70.4
Length of Basin (m)	16, 000	24, 000
Average Width of Basin (m)	10, 000	8, 000
Basin Perimeter (m)	50, 390	61, 307
Basin Circularity Ratio	0.498	0.467
Drainage Density	4.05	8.54

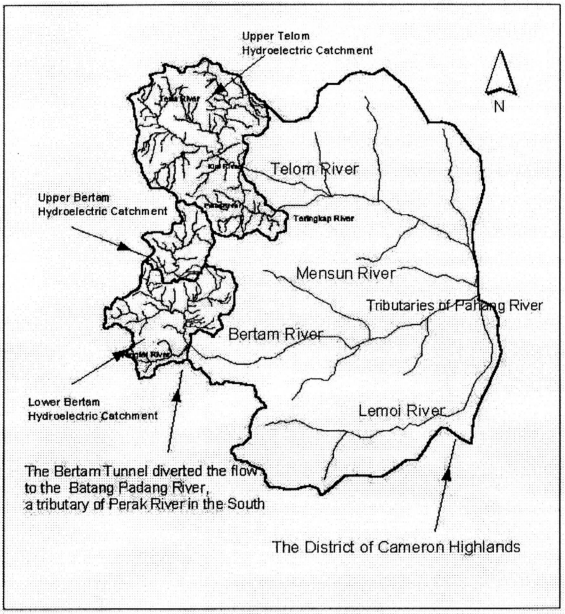

Fig.4.2.5: The Boundary and River System of the Hydroelectric Catchment.

Source: Modified from UM and TNBR (2001)

4.3 Socioeconomic Characteristics of CH

4.3.1 Administrative District

With a total area of 71,218 ha, CH is the smallest district in the State of Pahang Darul Makmur. It is located in the northwest corner of the state, bordering Kelantan State in the North and Perak State in the east. Geographically, it is relatively isolated. Until recently, the only access road is the Pahang Road from Tapah town in Perak Darul Ridzuan. Thus, it is quite remote from other town systems and the State administrative center of Pahang Darul Makmur in Kuantan.

The district of CH consists of nine settlement centres in three mukims, namely Mukim Ulu Telom, Mukim Tanah Rata and Mukim Ringlet. These small settlement towns are Kampung Raja, Kuala Terla, Tringkap, Kea Farm, Brinchang, Habu, Ringlet and Lembah Bertam. There are also a number of aboriginal (Orang Asli) settlements in the district.

Following the Tapah Road heading towards the North, the first settlement is Ringlet Town at 1,200 m above sea level and located in the Bertam Catchment. The soil in Ringlet area is rich. Thus, it becomes the main agricultural center of the highlands. The next town is Habu and followed by Tanah Rata at higher altitude. Tanah Rata is the principal township, where it is the main commercial and administration center of the district. The next town is Brinchang, which is about 3.5 km north of Tanah Rata. Beyond Brinchang, the road leads to Kea Farm, Pallas River, Tringkap, Kuala Terla, Kampung Raja and the Blue Valley Tea Plantation. **Fig. 4.1.1** also shows the locations of the settlements in the CH hydroelectric catchment.

4.3.2 Population in CH

Historical data on population can be traced back to 1931. The total population in CH increased from 1,842 in 1931 to 25,555 in 1991 as shown in **Table 4.3.1**. Population growth rate was fluctuating, ranging from 21.6% in 1947 to 1.7% in 1991. **Table 4.3.1** also shows that the annual increase of population was in the range of 249 per year in 1957 to 1970, and 614 per year in 1970 to 1980. This can be attributed to the government's policy of developing CH that encourages in-migration. Population is projected to increase at an average rate of 1.8% per year. Projected population as in the CH Structure Plan (CHDC, 1996) are 31 281, 38 828 and 49 759 for the year 2000, 2010 and 2020, respectively (**Table 4.3.2, Table 4.3.3** and **Fig. 4.3.1**).

Population distribution is shown in **Table 4.3.4**. In 1991, the total population in the Mukim of Ulu Telom was the highest with 46% of the population in CH, followed by 28.4% and 25.6% in Tanah Rata and Ringlet, respectively. However, the population density was very much higher in Tanah Rata (347 per km^2) and Ringlet (126 per km^2), whereas the population density in Ulu Telom was only 18.4 per km^2. On the average, the population density in this mountain area was still higher than the average density in the state of Pahang Darul Makmur as shown in **Table 4.3.1**. With the projected population increase, the population density will reach 70 per km^2 by the year 2020.

As shown in **Table 4.3.1**, the sex ratio in CH was reducing from 142 males to 100 females in 1947 to 112 males to 100 females in 1991. Changes in the sex ratio could be due to changes in economic activities from more labor intensive farming to machinery dependent, and also development of tourism and servicing industries.

In 1991, there were 5,324 families in CH with an average family size of 4.8 persons. The number of family had increased from 4,312 in 1980 (CHDC, 1996). Ethnic Chinese was the biggest ethnic group in CH (**Table 4.3.5**). Most of the Chinese were vegetable farmers. In 1991, 42.6% of the total population was Chinese, followed by 29.3% and 27.4% of Bumiputera and Indian, respectively.

Table 4.3.1: Population Trend in Cameron Highlands.

Year	State of Pahang Darul Makmur			Cameron Highlands District			
	Population	Annual Growth Rate	Density per square km[e]	Population	Annual Growth Rate	Density per square km[f]	Sex Ratio[g]
1931[a]	180,111	-	5	1,842	-	3	-
1947[a]	250,178	2.4%	7	8,204	21.6%	12	142
1957[b]	313,058	2.5%	9	12,126	4.8%	17	128
1970[c]	503,031	4.7%	14	15,365	2.1%	22	110
1980[d]	768,801	5.3%	21	21,502	4.0%	30	107
1991[d]	1,045,003	3.3%	29	25,555	1.7%	36	112

Note:

[a] M.V. Del. Tufo (1947). A report on the 1947 Census of Population, The Government Printer, Federation of Malaya.

[b] 1957 Population Census, Report No. 9, State of Pahang, Department of Statistics, Federation of Malaya, Kuala Lumpur.

[c] Volume 1 - Basic Population Tables Part VI – Pahang, 1970, Population and Housing Census of Malaysia, Department of Statistics, Malaysia.

[d] Population by Sex and Administrative District, Yearbook of Statistics, Malaysia, 1999, Department of Statistics, Malaysia.

[e] Area in Pahang = 35,965 km^2

[f] Area in CH = 712 km^2

[g] Sex Ratio: Males/100 Females

Table 4.3.2: Population Projection for the Years 1995 to 2020.

	Year					
	1995	2000	2005	2010	2015	2020
Population[a]	27,509	30,115	32,856	35,803	39,070	41,913
Growth Rate	1.86%	1.83%	1.76%	1.73%	1.76%	1.41%
Tourist (cumulative)	320,000	515,350	829,970	1,336,660	2,152,810	3,467,130
Tourist[b]	724	1,166	1,878	3,025	4,872	7,846
Average Staying Day[a]	2.04	2.04	2.04	2.04	2.04	2.04
Population[c]	28,233	31,281	34,734	38,828	43,942	49,759

Note:

[a] Population based on permanent resident only.

[b] Estimate based on number of tourist stay in CH at a particular time.

[c] Total population including average number of tourist per day in CH.

Source: CHDC, 1996.

Table 4.3.3: Summary for Population in Cameron Highlands.

Year	Population	Average Increase per year	Annual Growth Rate	Density per km^2
1931	1,842	-	-	3
1947	8,204	398	21.6%	12
1957	12,126	392	4.8%	17
1970	15,365	249	2.1%	22
1980	21,502	614	4.0%	30
1991	25,555	368	1.7%	36
1995	28,233	670	1.9%	40
2000	31,281	610	1.8%	44
2005	34,734	691	1.8%	49
2010	38,828	819	1.7%	55
2015	43,942	1,023	1.8%	62
2020	49,759	1,163	1.4%	70

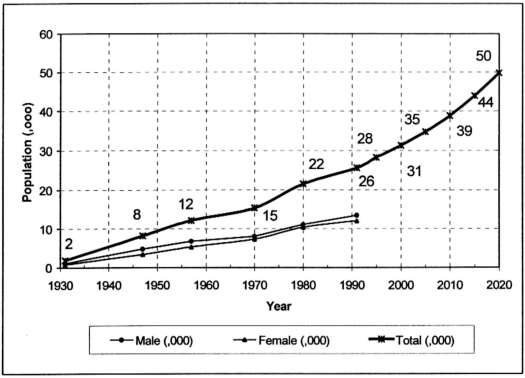

Fig. 4.3.1: Population Trend in Cameron Highlands for the year 1931 to 2020.

Table 4.3.6 shows that the five-year inter-state migration for 1986-1991 in CH was relatively high compared to the average in Pahang Darul Makmur. **Table 4.3.6** also shows that in-migrants and out-migrants were 9.8% and 8.2% in CH, respectively,

compared to 7.3% in-migrants and 8.3% out-migrants in Pahang. The rate of net migrants in the district of CH was positive 1.6% compared to negative 1.0% for Pahang.

Table 4.3.4: Distribution of Population by Mukim.

Area (km^2)	Ulu Telom		Tanah Rata		Ringlet	
	640		21		52	
	Population	Density	Population	Density	Population	Density
1947[a]	3,336	5.2	2,596	123.6	2,272	43.7
1957[b]	4,419	6.9	4,190	199.5	3,517	67.6
1991[c]	11,770	18.4	7,247	345.1	6,538	125.7

Note:
Density in population per km^2

[a] M.V. Del. Tufo (1947). A report on the 1947 Census of Population, The Government Printer, Federation of Malaya.

[b] 1957 Population Census, Report No. 9, State of Pahang Darul Makmur, Department of Statistics, Federation of Malaya, Kuala Lumpur.

[c] CHDC, 1996.

Table 4.3.5: Ethnic Group Composition in Cameron Highlands (1991).

Ethnic Group	Bumiputera		Chinese		Indian		Others	
	Total	%	Total	%	Total	%	Total	%
Pahang Darul Makmur	750,178	74.0	191,927	18.9	57,776	5.7	13,844	1.4
Cameron Highlands	7,275	29.3	10,571	42.6	6,800	27.4	181	0.7

Source: State Population Report: Pahang, Population and Housing Census of Malaysia, 1991, Department of Statistics, Malaysia.

Table 4.3.6: Five-Year Inter-State Migration (1986-1991).

	Pahang Darul Makmur	Cameron Highlands
In-migrants	7.3%	9.8%
Out-migrants	8.3%	8.2%
Net Migrants	-1.0%	1.6%

Source: State Population Report: Pahang, Population and Housing Census of Malaysia, 1991, Department of Statistics, Malaysia.

4.3.3 Economic Activities and Employment in CH

Economic activities are relatively diversified in this mountain region. However, agriculture activities and tourism are the major sectors in CH. Both activities contribute *significantly to the economic well being of the remote mountain area. Hydroelectric power generation is another major sector that generates revenue and provides job*

construction, transportation and utilities, wholesales, retails, food stalls, finance, banking, insurance, properties and other services.

In 1991, the labour force participation rates of the population aged 15 to 64 years in CH was 77.2% (Department of Statistics, 1991/a). As 63.5% of the total population fell within this age group, the total labour force was about 12,500. The rate of increase in manpower demand was relatively low in CH. It was 1.24% per year in the period from 1980 to 1995. Even though it had a high rate of out-migration of labour force, there were considerable in-migrations of labour force into CH especially for the tourism sector (CHDC, 1996).

The agricultural sector contributed the biggest job opportunity in CH. In the year 1980, the agriculture sector provided 7,305 employment out of 8,528 in the primary sector. It increased to 7,891 in the year 1995, which was 64% of the total available job. However, the importance of the agricultural sector is projected to reduce to 52% and 44% of the total job market in the years 2010 and 2020, respectively. **Table 4.3.7** shows the diversification of economic activities into sectors such as tourism, construction, and other service industries.

The average monthly household income in CH was RM1,245 in 1995. This was significantly higher than the average monthly income of RM997 for the State of Pahang Darul Makmur. About 54% of the household in CH earned a monthly income of between RM601 to RM1,500. The CH structure plan (CHDC, 1996) projects the monthly household income to be RM2,250 by the year 2020, with a 2.4% rate of increase per year.

Table 4.3.7: Job Projection for Cameron Highlands District.

	1980	1991	1995	2000	2005	2010	2015	2020
Primary Sector								
Farming	7,305	7,523	7,891	8,376	8,846	9,299	9,772	10,271
Tourism	522	610	714	889	1,108	1,335	1,586	1,839
Industrial	202	269	280	296	314	333	355	383
Public Sector	499	540	578	625	674	722	770	818
Total	8,528	8,942	9,463	10,186	10,942	11,689	12,483	13,311
Secondary Sector								
Construction			420	647	907	1,103	1,218	1,345
Transportation and Utility			397	434	479	534	599	677
Wholesaler, Retails and Food Stall			585	794	1,066	1,456	1,903	2,429
Finance, Insurance, Property and Business			115	127	143	166	197	240
Other Services			1,392	1,735	2,214	2,894	3,873	5,306
Total			2,909	3,737	4,809	6,153	7,790	9,997
Grand Total			**12,372**	**13,923**	**15,751**	**17,842**	**20,273**	**23,308**

Source: 1980-1995: Final Report on The Study of Development Impact in CH, "Laporan akhir kajian impak pembangunan ke atas CH", February 1993. *In:* Sellam Pereyasamy (1997), "Pembangunan Industri Pelancongan dan Kesannya ke atas Alam Sekitar di CH".
1995-2020: CHDC, 1996.

4.3.4 Other Socioeconomic Indicators

The student per teacher ratio at primary school in CH was 16.2 and 14.8 in 1995 and 1996 respectively. This was to be compared with the average ratio for the State of Pahang, which were 19.6 and 18.9 in the same years respectively. However, for the secondary school, the ratio was 20.0 and 19.5, when compared to 19.2 and 17.9 respectively in the state (See **Table 4.3.8**). In the same period of time, the transfer rate of student enrolment from both primary to secondary and lower secondary to upper secondary were well above 75% respectively (DOS, 1997; DOS, 1998).

According to the 1991 State Housing Report (DOS, 1991/b), 85.3% of 4,886 units of occupied houses in CH had have tap water supply. Other types of water supply were wells and streams. The access to electricity had also increased from 54% of the total living quarter to 88% in 20 years. The improvement in the social welfare of the

communities in CH was also indicated in the type of toilet facilities available in living quarters. As reported in 1970, the number of units of flush toilets available was 1,775 (66.7%) out of 2,663 living quarters. There were also 1,120 units of toilet facilities that were enclosure-over-water (streams/lake) type. However, the number of living quarters with flush toilets increased to 4330 in 1991, which is 88.6% of the total occupied housing units. The number of enclosure-over-water type toilet facilities was reduced to 97 units. Even though CH is in the remote mountain areas, the basic amenity facilities are matching the standard for the State of Pahang (**Table 4.3.9**). In conclusion, the socio-economic well being of this region is at a relatively better condition than the average of Pahang.

Table 4.3.8: Ratio of Student per Teacher in Cameron Highlands in 1995 and 1996

State/District	Number of Student Per Teacher			
	Primary School		Secondary School	
	1995[a]	1996[b]	1995[a]	1996[b]
State of Pahang	19.6	18.9	19.2	17.9
Cameron Highlands	16.2	14.8	20.0	19.5

Source: [a] State/District Data Bank, 1997, Department of Statistics, Government of Malaysia.
[b] State/District Data Bank, 1998, Department of Statistics, Government of Malaysia.

Table 4.3.9: Basic Amenity Facilities in Living Quarters in Cameron Highlands

Number of Living Quarters / Year		1970[a]		1991[b]		1991[b] (% for the State of Pahang)
		Total	%	Total	%	%
Type of Water Supply	**Piped Water**	2, 420	90.9	4, 169	85.3	85.7
	Others (well, river, canal)	243	9.1	717	14.7	14.3
Type of Lighting	**Electricity** (public supply or generator)	1, 442	54.1	4, 301	88.0	89.5
	Others (oil lamp, gas/pressure lamp)	1, 221	45.9	585	12.0	10.5
Type of Toilets Facilities	**Flush System** (including pour flush)	1, 775	66.7	4, 330	88.6	92.1
	Enclosure over water	28	1.1	97	2.0	1.2
	Others (bucket, pit)	611	22.9	129	2.6	2.1
	None	249	9.3	330	6.8	4.6
Total Occupied Living Quarters		**2, 663**		**4, 886**		

Source: [a] Population and Housing Census of Malaysia, 1970, vol. II: General housing tables towns, villages and local council areas, Part VI, Pahang, Department of Statistics, Malaysia.
[b] Population and Housing Census of Malaysia, 1991, State Housing Report, Pahang, Department of Statistics, Malaysia.