CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Historically, agriculture was the main sector of the Malaysian economy. As recently as 1970, the agriculture sector provided employment for nearly half of the working population and contributed about a third of total value added. However, rapid economic transformation has moved the country towards an industrialized nation. Export growth has been a major impetus for the rapid expansion of Malaysian economy. Malaysia's gross export earning recorded a strong growth in 1998 and is expected to increase by 7.6 percent to RM 308.6 billion in 1999 (Ministry of Finance 1999, pp. 97,108). Imports, on the other hand, increased at a slower rate to RM156.2 billion during the first eight months of 1999.

The manufacturing sector has been the leading sector in the economy for the past decade. Its contribution to gross domestic product (GDP) was 27.9 percent in 1998 compared to 13.9 percent in 1970. The manufacturing sector accounted for 27.0 percent of the total employment in 1998, up from 8.7 percent in 1970. Export of manufactured goods accounted for 85.4 percent of total gross exports in 1998 compared to 11 percent in 1970. The largest export group was electrical and electronic products, making up 68 percent of total manufacture exports in 1998, followed by chemicals and chemical products (4.4%); and textiles, clothing and footwear (3.9%). The services sector which contributed 55.6 percent to GDP in 1998, is also an important sector, although its development has not been as robust as that of the manufacturing sector. In contrast, the agricultural sector has been declining in importance. Between 1990 and 1995, the agriculture sector

grew by only 2 percent per annum and registered a negative growth in 1998. The proportionate contribution of agriculture to GDP has been declining from 29 percent in 1970 to 9.4 percent in 1998. Agricultural employment constituted 16.8 percent of total employment in 1998, down from 53.5 percent in 1970. In spite of all these structural changes in the national economy, the agricultural sector still contributes significantly to GDP, export earnings, and provides employment and food to the growing population as well as raw material to the agro–based industry.

In 1998, about 5.87 million hectares of the land in this country were alienated for agricultural use. Within the agriculture sector, oil palm has overtaken rubber as the most important export crop in Malaysia. Apart from new land development, more and more rubber and coconut plantations have been converted to oil palm plantations. In 1998, there were 3.08 million hectares of oil palm. Crude palm oil production increased by about 19.4 percent in 1999 as a result of improved weather, recovery from tree stress, increase in mature hectareage and higher oil extraction rate. Rubber, which was once a dominant crop in Malaysia, ranked second in total hectareage planted (1.6 million hectares), followed by paddy (0.66 million hectares). Rubber and cocoa experienced negative growth in production between 1996 and 1998. Production of sawlogs also declined significantly from 34 million tonnes in 1995 to 22.7 million tonnes in 1998, as a result of government's policy to maintain a lower cut and the softening of demand. On the other hand, positive growth in the food and miscellaneous subsectors has resulted slight increase in their contribution to total value–added during the same period

Malaysia's agriculture is export–oriented. The proportionate contribution of agricultural export to total exports was 10.5 percent with earnings amounting to

RM30,200 million in 1998 (Government of Malaysia 1999, p.168). Among the constraints faced by the agricultural sector are labour shortage, conversion of agriculture land for non-agriculture activities, declining and fluctuating prices of agricultural commodities, and low level of capital investment. The exodus of rural youths to urban areas also contributed to declining agricultural growth (Sivalingam 1993, p.4).

In conjunction with the launching of the First Outline Perspective Plan (1970-90), the Government introduced the National Economic Policy (NEP). The objectives of the NEP were to eradicate poverty among all Malaysians and to accelerate the reconstructing of Malaysian society so as to eliminate the identification of race with economic functions. The NEP was implemented over a period of 20 years and agricultural development had been the main focus as majority of low-income groups were employed in the agriculture sector. Consequent upon rapid socio-economic development, the incidence of poverty declined significantly from 49.3 percent in 1970 to 17.1 percent in 1990 (see Table 1.1). During the 20-year period following the implementation of the NEP, the incidence of poverty declined remarkably from 58.7 percent to 21.8 percent in the rural areas, and from 21.3 percent to 7.5 percent in the urban areas.

In 1990, the National Development Policy (NDP) was implemented to further improve income distribution, eradicate poverty and restructure society. The overall objective of NDP was to attain a balanced development based on the foundation laid down by the NEP to achieve the overriding goal of national unity. The incidence of poverty was further reduced to 6.8 percent in 1997. Nevertheless, poverty is still highly concentrated in the rural areas and within the traditional primary sector. In 1997, the proportion of households that were classified as

having incomes below the poverty line in rural areas was 11.8 percent as against 2.4 percent in urban areas (see Table 1.1). The incidence of poverty is relatively high among the paddy farmers, rubber smallholders, coconut smallholders and fishermen. In terms of region, the four poorest states are Kelantan, Terengganu, Sabah and Kedah (see Table 1.2).

Table 1.1: Incidence of Poverty, 1970, 1990 and 1997

	1970 [a] (%)	1990 (%)	1997 (%)
Overall	49.3	17.1	6.8
Rural	58.7	21.8	11.8
Urban	21.3	7.5	2.4

Note: [a] Peninsular Malaysia only.

Sources: Government of Malaysia (1991), *The Second Outline Perspective Plan 1991–2000*, Table 2.6, p.46.

Government of Malaysia (1999), *Mid-Term Review of the Seventh Malaysia Plan 1996-2000*, Table 3.1, p.63.

Table 1.2: Incidence of Poverty by State, 1997

State	Incidence of poverty (%)
Johor	1.6
Kedah	11.5
Kelantan	19.5
Melaka	3.6
Negeri Sembilan	4.5
Pahang	4.1
Perak	4.5
Perlis	10.6
Pulau Pinang	1.6
Sabah [a]	22.1
Sarawak	7.5
Selangor	1.3
Terengganu	17.3
Wilayah Persekutuan Kuala Lumpur	0.1

Note: [a] Includes Wilayah Persekutuan Labuan.

Source: Government of Malaysia (1999), *Mid-Term Review Of The Seventh Malaysian Plan 1996–2000*, Table 3.2, p.64.

During the Seventh Malaysia Plan period (1996-2000), RM7,566.3 million was allocated for agricultural development. Similar to the Sixth Malaysia Plan (1990-1995), greater emphasis was given to the in-situ land development programmes, followed by the support services programmes. In-situ development programmes include Integrated Agricultural Development Projects (IADPs), replanting as well as land consolidation and rehabilitation. As for the support services, they include agricultural credit, research and development, processing and marketing as well as extension and other services. At present, agricultural development is guided by the Third National Agriculture Policy (NAP3-1998–2010) with new approaches on agro-forestry and product–based outputs. The agro-forestry approach emphasizes the integration of agriculture with forestry to enable wider crop-mix possibilities in order to increase the value of agricultural resources and income. The product-based approach allows the development of agricultural activities that are consistent with the strategic clusters identified under the Second Industrial Master Plan (Government of Malaysia 1999, p.185).

1.2 THE AGRICULTURE SECTOR IN SELANGOR

Selangor is the most developed state in Malaysia. In 1998, about 13.9 percent of the total population lived in Selangor. Majority of the population are concentrated in the urban areas and are engaged in the non-agricultural activities. Figure 1.1 shows that employment in the manufacturing sector accounted for the largest share (29.3%) of the total employment in Selangor, followed by community, social and personal services (21.6%); and wholesale, retail trade, restaurants and hotels (18.1%). Agricultural employment, on the other hand, made

up only 3.6 percent of total employment in the state in 1997 and is expected to decline further in the years to come.

Selangor has a land area of 7,955 square kilometers. In 1997, 273,805 hectares of the land was under cultivation. Table 1.3 shows the predominance of industrial crops, accounting for about 94 percent of the total hectareage in the state. Among the industrial crops, oil palm is the most important, covering nearly 58 percent of the total cultivated area. The second largest crop is paddy (36,898 hectares, followed by rubber (27,521 hectares) and coconut (29,701 hectares). The bulk of oil palm plantations in Selangor are in Kuala Selangor and the bulk of rubber plantations are in Hulu Selangor. The district of Sabak Bernam, on the other hand, has the largest planted hectareage of paddy, coconut and cocoa (see Table 1.4).

Figure 1.1: Distribution of Employment by Main Sector in Selangor, 1997

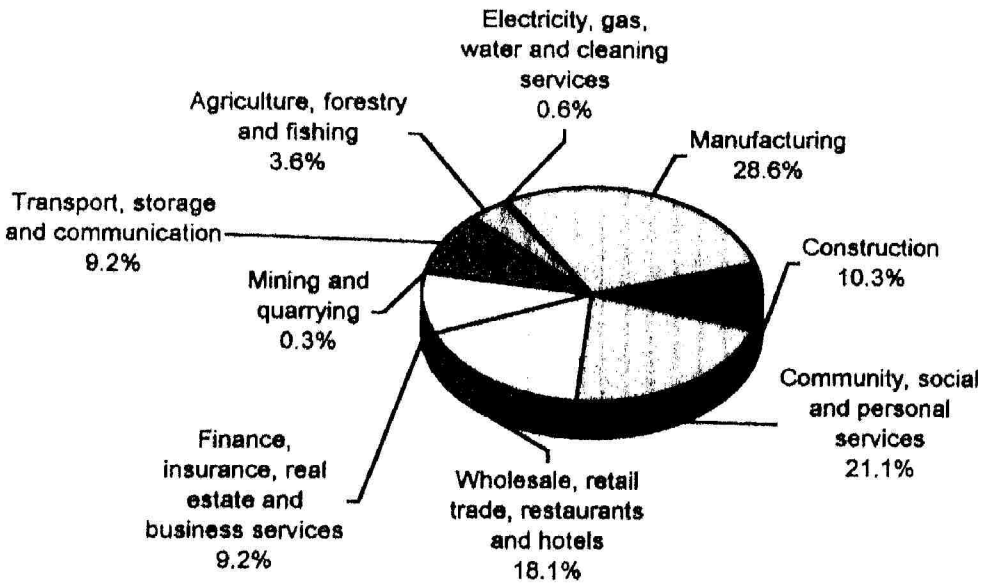

Table 1.3: Crop Hectareage by Category, Selangor 1997

Crop Category	Hectareage
Industrial crops	258,657
Fruits	12,256
Vegetables	1,185
Cash crops	1,058
Spices	627
Other crops	22
Total	273,805

Source: Department of Agriculture (1998), *Crop Hectareage Statistics, Peninsular Malaysia, 1997*, Table 1.1, p.3.

Table 1.4: Hectareage of Industrial Crop by District and Type of Crop, Selangor 1997

District	Industrial Crop							
	Rubber	Coconut	Oil palm	Cocoa	Coffee	Paddy	Sugar cane	Tea
Gombak	4,564.0	8.0	2,095.5	–	–	–	2.0	–
Hulu Langat	260.0	10.0	304.0	4.0	–	211.0	10.0	–
Hulu Selangor	16,200.0	3.0	17,864.0	1.0	–	–	–	–
Kelang	637.0	3,006.0	16,393.0	420.0	513.0	–	7.6	–
Kuala Langat	282.0	1,156.0	65,384.0	117.0	576.0	–	2.0	212.0
Kuala Selangor	852.0	7,226.0	43,233.8	460.0	78.0	11,025.0	25.0	–
Petaling	4,001.0	–	5,000.0	–	–	–	–	–
Sabak Bernam	–	18,287.5	2,749.0	4,223.4	2.0	25,662.0	49.0	–
Sepang	725.0	4.0	4,732.0	–	80.0	–	–	–
Total	27,521	29,701	157,755	5,225	1,249	36,898	96.0	212.0

Note: Due to rounding, figures may not add up to totals shown in the last row of the table.

Source: Department of Agriculture (1998), *Crop Hectareage Statistics, Peninsular Malaysia, 1997*, Table 4.9, pp.206-207.

Selangor's vision to become a fully industrialized state by year 2005 has great implications on the agriculture sector. Although it has the second lowest poverty rate in the country, the standard of living of farmers still lags behind those in the secondary and tertiary sectors. Various measures have been carried out under the

1984 and 1992 National Agriculture Policies, which were aimed at improving agriculture productivity and farmers' income. These measures include subsidies, introduction of high-yielding seeds, organic fertilizers, in-situ and new land development, research and development activities, market and human resource development as well as training and extension services. A study of the income and expenditure patterns of farmers in Selangor would provide useful inputs in formulating policies and programmes to further improve the wellbeing of agricultural families[1] in Selangor.

1.3 OBJECTIVES AND ACTIVITIES OF FARMERS' ORGANIZATION AUTHORITY

The Farmers' Organization Authority (FOA) was set up on 14 February 1973 under the Ministry of Agriculture. Since its establishment, it has been responsible for the setting up and development of farmers' institutions. The objective of FOA is to establish and develop viable, self-reliant Farmers' Organization (FO) into strong farmers' movements towards uplifting the social and economic status of their members. Figure 1.2 shows the organizational structure of FO. As at December 1997, there were 199 Area Farmers' Organizations (AFO), 12 State Farmers' Organizations (SFO) and one National Farmers' Organization (NAFAS) in Peninsular Malaysia. The total number of AFOs membership is 438,162, with a paid up capital of RM36 million. In the state of Selangor, there are 14 AFOs with a total of 36,959 members.

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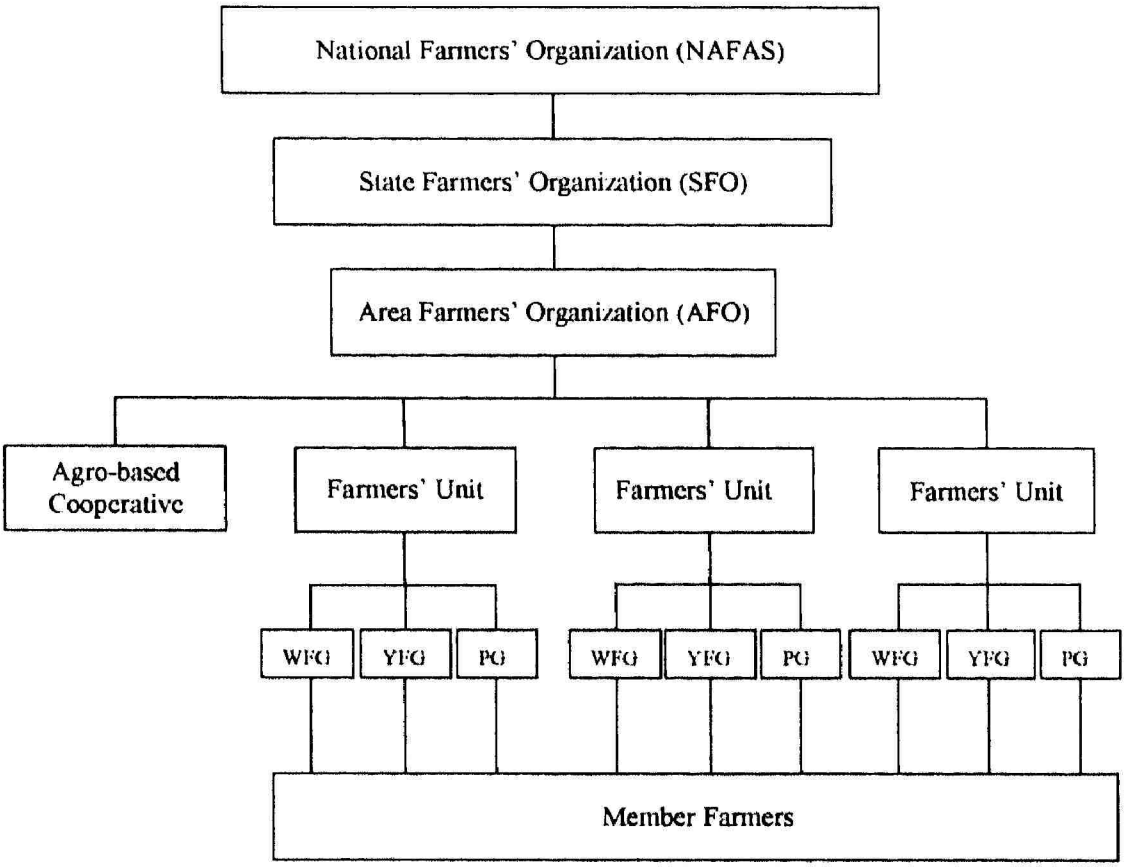
[1] Throughout the report, 'agricultural households', 'farm households', 'agricultural families' and 'farm families' are used interchangeably to refer to households from the agricultural communities.

In developing FO's economic and social activities, various programmes and projects are being implemented by FOA. Table 1.5 provides a listing of the programmes and projects of FOA under the Seventh Malaysia Plan (1996 – 2000).

Figure 1.2: Organization Structure of Farmer' Organizations



WFG – Women Farmers' Group
YPG – Young Farmers' Group
PG – Products' Group

Source: Farmers' Organization Authority, "A Brief Note On The Farmers' Organization Authority (FOA) And Its Role In Rural Development Through The Farmers' Organization".

Table 1.5: Development Programmes and Projects of FOA

Programmes	Projects
1. Farmers' Development Programme	i. Farmers' Unit / Village ii. Development Village-based Human Development
2. Food Production Programme	i. Nucleus Estate and Farm ii. Management Farmers' Organizations Orchard Farm / Fruits Production
3. Landscape Plants Production Programme	i. Landscape Plants Production
4. Small and Medium Industry Programme	i. Agro-based Industries
5. Food Marketing Programme	i. Marketing of Farm Produce
6. Human Resource Development Programme	i. Farmers' Training ii. Officers' Training iii. Promotion and Communication
7. Farmers' Basic Facilities Programme	i. Farm Machinery ii. Infrastructure
8. Farmers' Institution Development Programme	i. Computerization of FOs and FOA ii. Research and Studies
9. Special Programme	i. Corporate Development ii. Poverty Development Project iii. Agrotourism iv. Agro-based Cooperative Societies Development v. Sabah FOA

Source: Farmers' Organization Authority, "A Brief Note On The Farmers' Organization Authority (FOA) And Its Role In Rural Development Through The Farmers' Organization".

1.4 OBJECTIVES OF THE STUDY

The objectives of this study are:

1. To examine the income levels of farmers in Selangor, and income differentials across districts and socio-economic groupings;
2. To examine the household expenditure patterns among different sub-groups of the agricultural communities in Selangor;
3. To assess the general well-being of the agricultural communities in Selangor; and
4. To discuss the policy implications of the findings and to put forth some recommendations for improving the well being of the farm families in Selangor.

1.5 SIGNIFICANCE OF THE STUDY

Income and expenditure are closely interrelated and they are important determinants of the standard of living. The majority of the Selangor population can be found in the urban areas and less than 10 percent of the population is in the agriculture sector (Department of Statistics 1995a, pp. 5, 9). As such, even though the mean monthly household income for Selangor is high, this statistics may not be reflective of the economic condition of agricultural communities. This study will enable us to have a clearer insight into the actual situation of rural population in this state, which may provide a broad picture to those in other states as well. It can also help to evaluate the effectiveness of programmes carried out so far and to identify the categories of farmers that are in need of help. This study may provide

some useful findings for the formulation of policies and programmes to improve the socio-economic status of the agricultural communities.

1.6 LITERATURE REVIEW

The study of the relationship between expenditure and income when prices remain constant was initiated by Ernest Engel in 1857 and is known as Engel curve analysis. The first study of Engel curves on Malaysian data was carried out by Purvis, M.J. (1966); while the second was conducted by Halim, A.I. (1971). Both studies used the data from the Household Budget Survey of 1957/58. According to Engel's laws, as the income of a family increases, a smaller percentage is expended on food, and the percentage spent on clothing remains approximately the same (Gee 1954, p.404). On the other hand, there would be an increase in the percentage spent on education, health, recreation and various services as income increases, while the percentage spent on rent, fuel, and light remains invariably the same. Kirkparick (1929) found that as the income of the families increases: (1) the percentage spent for clothing decreases; (2) the percentage of expenditure for rent tends to decrease slightly; and (3) the percentage expended for fuel decreases.

Lim (1974) conducted a study on the pattern of income distribution in West Malaysia for the 1957-1970 periods. The study was based on the 1957/58 Household Budget Survey of the Federation of Malaya, the 1960 Federation Saving Survey, the 1967/68 Socio-Economic Sample Survey of Household and the 1970 Post Enumeration Survey. The mean monthly household income was found to be RM220, RM250, RM235 and RM275 from each of the surveys, in that order. For each of the referenced years, less than 30 percent of households had income above the mean. The monthly personal income for agriculture sector in 1967 was

RM75 on the average. She used the Gini coefficient to measure inequality and found that income inequality had been on the increase over the years. Her study also showed poverty was concentrated among Malay households, in agriculture and agriculture-related sector, households whose heads had low level of education, households headed by own-account workers or farmers, households headed by female and households whose heads were outside the labour force age group.

In 1981, the World Bank conducted a study on the incidence of poverty and the characteristics of the poor in Peninsular Malaysia. The data used was from the 1973 Household Expenditure and Income Survey. For the agriculture sector, the mean monthly earning of employees was RM113.5, the monthly per capita income was RM39.91 and the monthly per capita expenditure was RM37.36. Mean monthly earnings of workers, monthly per capita income and expenditure for selected sectors are summarized in Table 1.6.

Table 1.6: Mean Monthly Earnings of Employees, Monthly Per Capita Income and Expenditure by Selected Industries, 1973

Sector	Mean Monthly Earning (RM)	Monthly Per Capita Income (RM)	Monthly Per Capita Expenditure (RM)
Paddy	39.7	35.46	32.21
Rubber	128.8	43.67	40.92
Oil palm	105.4	–	–
Coconut	82.4	–	–
Other agriculture	114.9	41.30	40.44
Livestock	112.2	53.78	49.97
Forestry	265.4	56.79	47.18
Fishing	91.1	29.99	30.59

Note: – Not available

Source: World Bank (1981), "Incidence of Poverty and the Characteristics of the Poor in Peninsular Malaysia, 1973", Tables 4 and A.23, pp.89-90 and A.55-56.

The World Bank's study found that income inequality was less pronounced in rural areas as compared to the urban areas. The report shows that poverty was above the average in urban and rural areas if the head of household (1) had received no formal education, (2) was self-employed or a family helper and (3) was an agriculture worker. In the multivariate analysis of per capita income and expenditure, educational attainment of the heads of households was found to be the most important explanatory variable. The study found that food accounted for 47 percent of the total expenditure in the rural household. Greater elasticity was shown in the demand for domestic service, durable goods and recreation equipment; as well as entertainment and gambling.

A study by Tan (1982) on the distribution of income and wealth in Malaysia found that in the late sixties and early seventies, households from the landless agriculture labourers, the small paddy cultivators, small rubber smallholders, unmotorized fishermen and estate workers earned less than RM125 per month. As for double cropping paddy farmers, larger rubber smallholders with matured, replanted land, and trawler fishermen, their household monthly income ranged between RM125 and RM250.

Anand (1983) studied the patterns of income inequality in Malaysia based on the 1970 Post Enumeration Survey (PES). Among the poor households, 77.4 percent were headed by farmers or farm labourers. Fully 97.2 percent of the poor households have heads that only attended primary school or less. In the rural areas, 62.7 percent of households whose heads were in the agriculture sector had per capita household income of less than RM25 per month, while personal income of farmers was RM101 per month. In terms of ethnic group, Chinese farmers had the highest income per month (RM214), followed by Indian farmers (RM160) and

Malay farmers (RM84). His study found that Selangor, the state with the highest per capita income had the highest Gini coefficient in terms of individual income (0.5206) and also household income (0.5243). Table 1.7 shows the incidence of poverty among five selected subgroups in Selangor.

Table 1.7: Incidence of Poverty among Five PES Subgroups in Selangor

	Subgroup				
	Paddy smallholders and livestock and mixed-agriculture farmers	Labourers on paddy, livestock, and mixed-agriculture farms	Rubber smallholders	Labourers on rubber estates or smallholdings	Fishermen
Incidence of poverty (%)	44.9	40.7	39.8	42.0	46.2
Number of poor households	122	22	51	86	6
Total number of households	272	54	128	205	13

Source: Anand(1983), *Inequality and Poverty in Malaysia*, Table 6.11, pp.230-236.

In studying the income and expenditure patterns of Malaysian Indian rubber tapper households, Lim (1979) found that the number of working members in the household was an important determinant of the household income, which included cash and non-monetary payment. On the expenditure pattern, it was found that (1) food took up the largest proportion of household expenditure, especially among the lower income households, and (2) households with higher income spent relatively larger amount on consumer durable and entertainment compared to lower income households. Average monthly household income and expenditure was estimated at RM520.75 and RM409.38 respectively.

In studying the income distribution, consumption and saving behaviour of farm households in the Muda Irrigation Scheme, Lai (1977) found that net farm

income was RM1720 per year, while total cash expenditure per household was RM 1095 per year, on the average. It was also found that the farm households spent around RM620 on food per year, and the balance was used for non-food items.

A study by Sulaiman (1974) on the Felda settlers in Sungai Panching Utara Oil Palm Scheme estimated the mean total income and expenditure at RM168 and RM125.2 per month respectively. Food item made up the biggest share (approximately 69 percent) of household expenditure. The proportion spent on food was also relatively larger among the lower income group. On the other hand, the more "luxurious" items were consumed by those from the higher income group.

In 1991, Vijaya conducted a case study on income and its effects on expenditure in two estates in Sungai Buloh. Key variables used in the study include household income, which consisted of wage income of household head, from other household members, part time job, income in kind and remittances. It was found that income from household heads was the main source of income as well as the main determinant of the level of household income. Low-income level was mainly due to low level of education and lack of skill. Consumption of basic needs did not increase proportionately with the increase of household income; but that of durable goods and luxurious goods increase with the increment in household income. Household size and age structure were found to be important determinant in food expenditure. Demand for luxury items was much more elastic as compared to the household necessity.

A recent study on income inequality and poverty in Malaysia was carried out by Shireen (1998), using data from the Household Income Survey of years 1980, 1984, 1987 and 1989. She found that income inequality in Selangor was the

third highest in Malaysia in 1987 and rose to second highest in 1989. Poverty was predominantly a rural and agricultural problem, but it is decreasing with improvement in education.

The 1993/94 nationwide Household Expenditure Survey conducted by the Department of Statistics, Malaysia (1995b, pp.13-17), estimated the living expenses of households headed by employees and the self-employed/employers in the agriculture sector at RM803.78 and RM780.82 respectively. Expenditure on food accounted for over 30 percent of the household budget in the agriculture sector, while expenditure on transport and communication was the second major expenditure category, followed by expenditure on rent, food and power. In Peninsular Malaysia, the proportion of household expenditure on food has an inverse relationship with the level of expenditure and income. The survey also found that the average household expenditure increases from RM610.67 for one-person households to RM1,294.94 for five-person households and RM1,600.01 for ten-person households.

1.7 METHODOLOGY

1.7.1 Definition

Household is defined as a person or a group of persons, related or not to one another, who occupy the same dwelling unit and live there together. In all the surveys conducted by the Department of Statistics, household is defined as a group of people who share a common residence, eat from the same cooking pot and participate in income pooling and decision-making.

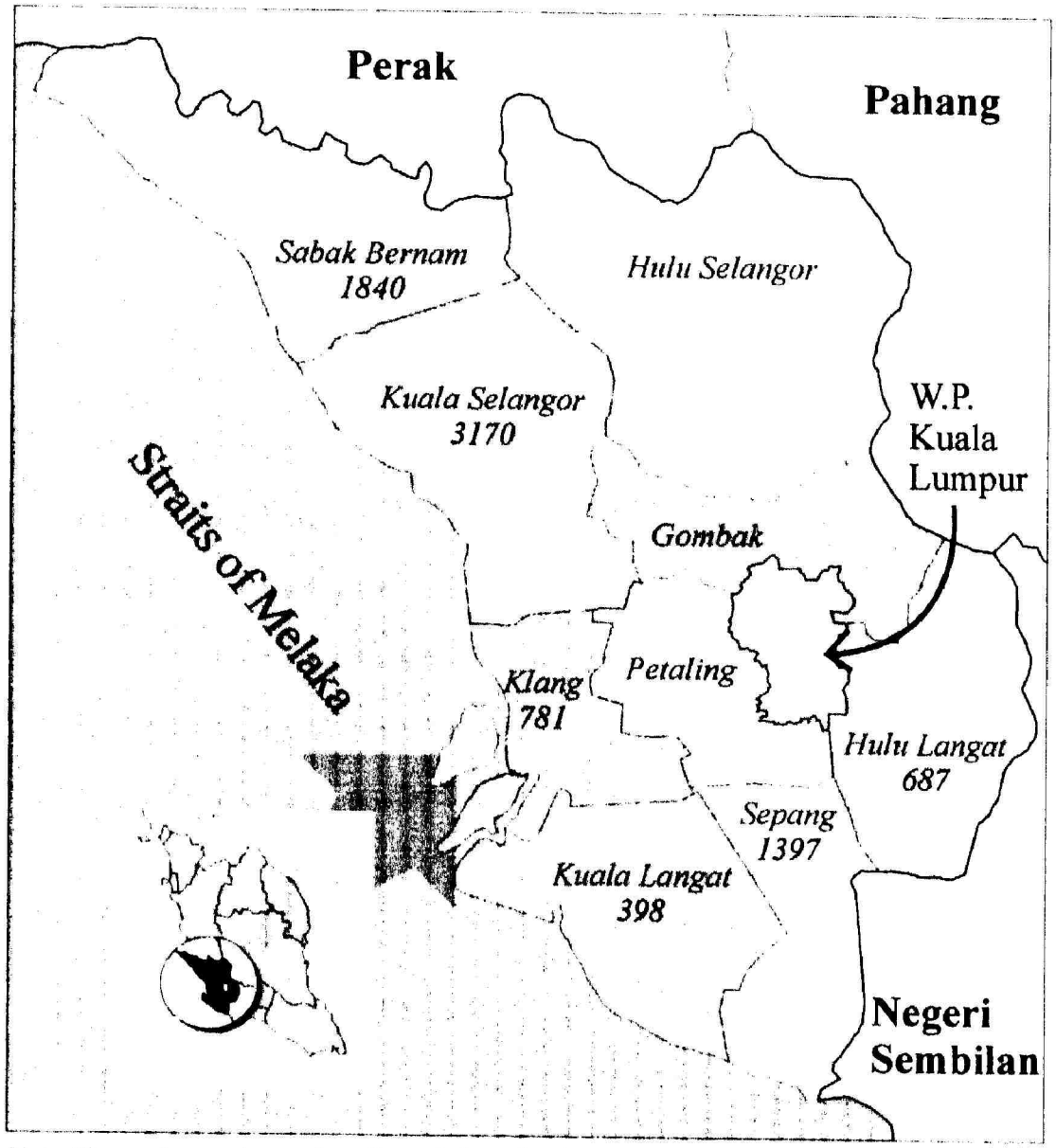
Income is conventionally regarded as a flow of returns from human and non-human assets alike (Bronfenbrenner 1971, p.25). In the national accounting

sense, income is divided into cash income and income in kind. Definition of income is confined to cash income only in the Socio-Economic Sample Survey of Households 1967-1968, while in the Post Enumeration Survey of 1970 census, income is defined to include both income in cash and kind. In the case when only cash income is used, Lim (1974) observed that income from the agriculture would have been underestimated level as part of the income is in non-cash term.

1.7.2 The Data

This study is based on data from the Socio-Economic Survey of Farm Households under Area Farmers' Organization (AFO) in Peninsular Malaysia, conducted by the Farmers' Organization Authority (FOA) in 1993. The dwelling units in the agricultural communities comprise the main sampling units and the household heads were the main respondents to the survey. The survey covered all the states in the Peninsular Malaysia but owing to the time constraints required in data cleaning, this study focuses only on the state of Selangor. There are altogether 14 AFOs in Selangor and 12 were covered by the survey, with a total of 14,056 farm households. After going through the process of data screening and consistency checks, information from 8335 sample households in six districts of Selangor, namely Hulu Langat, Klang, Kuala Langat, Kuala Selangor, Sabak Bernam and Sepang are used for analysis in this study. The geographical location of Selangor and household sample size by district are shown in the map in Figure 1.3.

Figure 1.3 The Map of Selangor



Note: Figures denote the number of sample households and there are 62 missing values.

The data on income include only sources of income of the heads of households. In this study, income is measured in terms of cash income, as information about non-monetary income or income in kind is not reported. The data on household expenditure provide information concerning amount spent on each category such as food, clothing, education and others. In this survey, the reference period for income and expenditure is the one-month prior to the survey.

1.7.3 Framework of Analysis

The variables in this study are divided into dependent and independent (or explanatory) variables.

The dependent variables are:

(1) Total income of heads of households

(2) Total household expenditure

(3) Expenditure by category

The independent variables are:

(1) Age of head of household

(2) Gender of head of household

(3) Ethnicity

(4) Household size

(5) District

(6) Education level of head of household

(7) Main occupation of head of household

Gender, ethnicity, occupation of head of household and district are measured in nominal scale. Income, expenditure, age of head of household and

household size are measured in ratio scale. The data on education only show the level of schooling and not the years of schooling of those who went to school, and hence it is measured in ordinal scale. Due to small sample size, the category of adult education is grouped under no formal schooling; vocational education is grouped under upper secondary level while tertiary level includes college and university education. For the data on occupation, categories with small sample size are also being combined. Livestock keepers include aqua culturists while other crop growers include vegetable, coconut, coffee and tobacco growers. Though missing values are found in most of the variables, the problem is not serious as the proportions involve are significantly small. The exclusion of cases with missing values explains the different sample size across tables shown in the following chapters. Table 1.8 shows the frequencies and percentages of missing values according to selected variables.

Table 1.8: Frequency and Percentage of Missing Values by Selected Variables

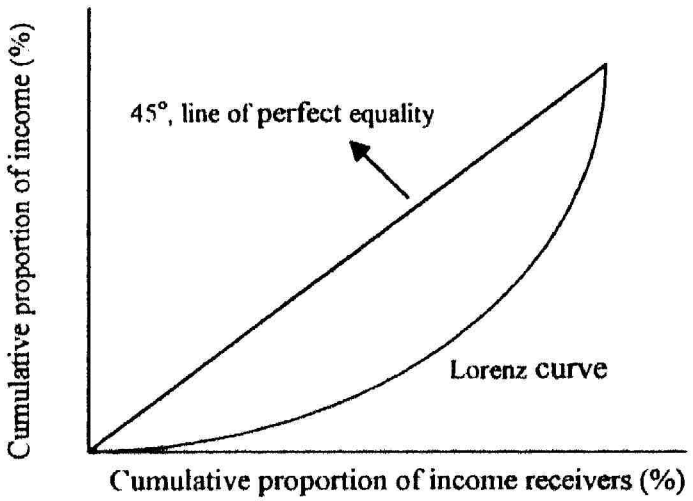
	Frequency	Percent
Age	32	0.38
Education level	1	0.01
District	62	0.74
Main occupation	823	9.90
Household size	173	2.10
House ownership	138	1.70
Type of house	141	1.70
Total income	283	3.40
Total household expenditure	243	2.90

The computer package SPSS (Statistical Package for the Social Sciences) will be used in analyzing the data. Univariate and bivariate analyses as well as multivariate analyses will be carried out. Univariate and bivariate analyses include

frequency distributions, descriptive statistics, comparing group means, cross-tabulations, chi-square test, one-way analysis of variance and F-test. Multivariate analyses will include analysis of variance (ANOVA), multiple classification analysis (MCA) and multiple regression.

Gini coefficient will be used to measure income inequality. The Lorenz curve and Gini coefficient are the most widely used tools in measuring income differentials or inequality. Some other measures include the coefficient of variation, relative mean deviation, variance of the logs of income, Kuznets index, Theil index and etc. The Gini coefficient is relatively sensitive to inequality occurring in the middle of the income distribution (Champernowne 1974, pp.787-816). It is related to the Lorenz curve (Figure 1.4), which shows the degree of inequality graphically by plotting the cumulative proportion of income against that of income receivers.

Figure 1.4: Lorenz Curve



If the income were equally distributed among all receivers, the curve would natch the 45° line perfectly. Otherwise, the curve lies below the diagonal line. The loser the curve to the diagonal implies a lower level of inequality. Gini coefficient s the ratio of the area between the Lorenz curve and diagonal to the total area nder the diagonal. It varies between zero (perfect equality) and one (perfect nequality). The higher the Gini, the more unequal the distribution of income. The ormula for computing the Gini is

$$G = \sum_{i=1}^{n-1} a_i b_{i+1} - \sum_{i=1}^{n-1} b_i a_{i+1}$$

where

a_i = Cumulative proportion of income receivers in the i^{th} group

b_i = Cumulative proportion of income of the i^{th} group

(i = 1, 2, ...n-1)