CHAPTER 3

INCOME DIFFERENTIALS IN THE AGRICULTURAL COMMUNITIES IN SELANGOR

3.1   INTRODUCTION

Malaysia has made great stride in socio-economic development. The Malaysian economy has undergone significant changes. With a per capita income of US $8196, Malaysia is classified by the World Bank as a middle-income country. The successful implementation of the various programmes has brought about sharp decline in the level of poverty. Nevertheless, pronounced income differentials can still be observed across regions and the various sub-groups of the population.   In 1997, the average monthly household income of RM1669 in the rural areas throughout the country is less than half the average monthly income of RM3,406 among urban households (Government of Malaysia 1999, p.68). Generally, the income level of agricultural workers tends to be much lower than those engaged in secondary and tertiary sectors. Substantial variations in the level of income also exist within the agriculture sector. Table 3.1 shows the differentials in household income among different agricultural groups under various development schemes. Average monthly household incomes of rubber and oil palm settlers did not increase significantly between 1984 and 1990. However, the average monthly income of FELCRA paddy farmers in 1990 was more than twice as large as that of 1984.

In the 1980s decade, the western states where Selangor is located registered the most rapid growth of agricultural productivity, and this propels the region to displace the southern region with the highest agricultural income. The different rate of growth

of agricultural labour productivity across regions has widened income inequality (see Table 3.2).

Table 3.1: Mean Monthly Net Income (RM) of Selected Development Scheme Households, 1984-1990

Scheme	1984	1985	1986	1987	1988	1989	1990
FELDA							
Rubber	506	421	406	530	721	589	483
Oil palm	1225	697	376	522	871	669	439
FELCRA							
Rubber	350	284	348	501	553	318	466
Oil palm	715	395	380	402	484	269	478
Paddy	277	342	403	432	435	655	726
MUDA							
Paddy	207	237	–	–	–	267	360
RISDA							
Rubber	353	333	359	375	400	331	324

Notes: (–) Not available. The income for FELDA and FELCRA is net of the monthly deductions for the costs of house, land and/or land development.

Source: Ministry of Agriculture (1993), "The National Agricultural Policy (1992-2010)".

Table 3.2: Agricultural Productivity by Region, 1980-1990

Region	1980 (RM)	1990 (RM)	Growth (%)
Western states	5900	10614	79.9
Southern states	7042	9464	34.4
Northern states	4489	6276	39.8
Sabah and Sarawak	4757	7466	56.9

Source: Shireen (1998), Income Inequality and Poverty in Malaysia, Table 6.17, p.148.

In this chapter, income differentials of heads of households in the agricultural communities in Selangor will be examined in terms of age, gender, ethnicity, education level and occupation of the heads, as well as sub-sector, district and household size. In this survey, income of household heads includes earned income from the main job and supplementary job, as well as rental, pensions, other social security benefits, dividends and remittances. Information on income of other household members was not collected in this survey, and this precludes an analysis of household income.

3.2 INCOME LEVEL AND DISTRIBUTION IN THE STUDY AREAS

The income level in the agricultural communities in Selangor is rather low -- some 30.1 percent of the heads of households in the study areas have a mean monthly income of RM200-399, while 27 percent have a mean monthly income of RM400-599 (see Table 3.3). Moreover, the relatively large standard deviation and inter-quartile range indicate that income is not evenly distributed in the agricultural communities. On the one end, 6.5 percent of the household heads in the study areas have an average monthly income of less than RM200; on the other end, 13.8 percent earn at least RM1000 per month. Overall, the mean and median monthly income of heads of households was estimated at RM605.1 and RM499.3 respectively. The mean income of the poorest 20 percent is RM187.6 as against RM1313.2 of the richest 20 percent. This results in a rather high (7.0) income disparity ratio of richest 20 percent to the poorest 20 percent. The pattern of the income distribution in the study areas is rather typical --skewed to the right.

Table 3.3: Distribution of Monthly Income of Heads of Households

Income Group (RM)	Frequency	Percentage	Cumulative Percentage
<200	524	6.5	6.5
200-399	2422	30.1	36.6
400-599	2176	27.0	63.6
600-999	1816	22.6	86.2
≥1000	1114	13.8	100.0
Total	8052	100.0	

Mean income (RM)	605.1
Mean income of the bottom 20% income group (RM)	187.6
Mean income of the top 20% income group (RM)	1313.2
Median income[a] (RM)	499.3
Modal income (RM)	377.1
Interquartile range	400.0
Standard deviation	529.4
Top 20% / Bottom 20%	7.0
Skewness	3.3
Kurtosis	15.8

Note: [a] Calculated from the group data

In the following sections, income differentials across the various sub-groups will be examined. As most variables in this survey contain missing values, the sample size would not be constant across tables. However, the number of cases with missing values for most variables are not very large, and the exclusion of such cases would have only rather small effects on the findings in general.

3.3 INCOME DIFFERENTIALS BY GENDER OF HEADS OF HOUSEHOLDS

Some variations can be observed in the income level between the male and female heads of households (see Table 3.4). The median monthly income of about RM522 among the male heads of households is significantly higher than RM407 reported by their female counterparts. Likewise, mean income for the male heads of

households of about RM639 is also significantly higher than RM488 reported for female heads (p<0.01). Chi-square test confirms the significant relationship (p<0.01) between income and gender. Moreover, the Gini coefficient for women is slightly higher than that of men, indicating that income inequality is more pronounced among the female heads of households as compared to that of their male counterparts.

For the youngest age group (less than 30 years), the mean income of male heads of households is not significantly higher than that of their female counterparts (p=0.2545). However, mean income of male heads significantly (p<0.01) higher than that of female head for all other age groups (see Figure 3.1). The sharpest gender differential can be observed among those in the 50-59 age group.

Table 3.4: Percentage Distribution of Heads of Households by Income Category, According to Gender, With Mean Income, Median Income and Gini Coefficient for Each Gender

	Gender	
	Male	Female
Income group (RM)		
<200	4.2	14.4
200–399	28.7	34.8
400–599	28.0	23.5
600–999	23.8	18.3
≥1000	15.2	9.1
Total	100(6263)	100(1789)
Mean income (RM)	638.6	487.6
Median income* (RM)	522.1	406.8
Gini coefficient	0.3491	0.3756

Note: * Calculated from the group data

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Figure 3.1: Mean Income by Age and Gender of Heads of Households
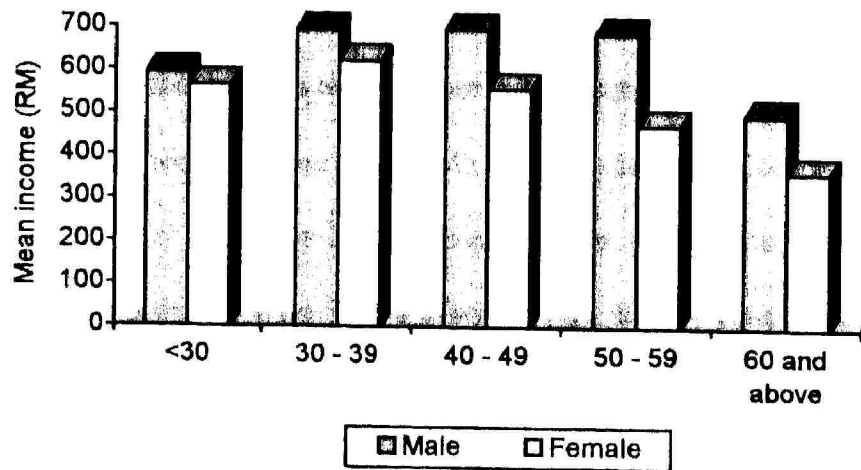

Figure 3.2 shows that the male advantage in income persists across all three main ethnic groups. However, the difference in mean income between Chinese females and Chinese males in this sample is not statistically significant $(p=0.394)$.

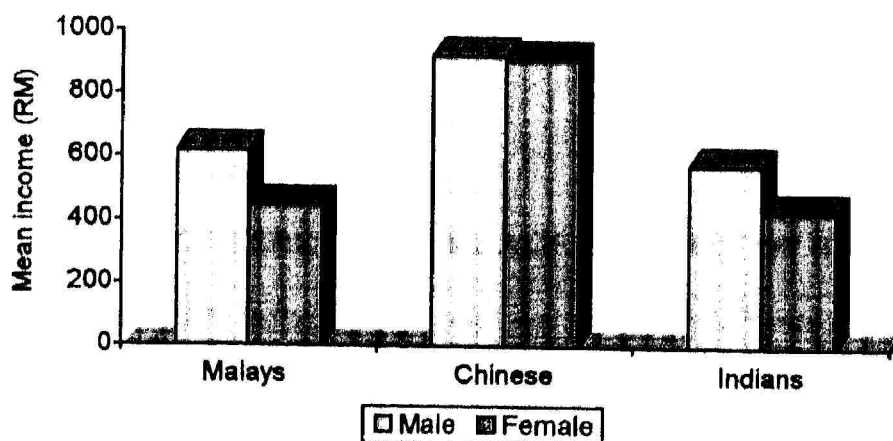Figure 3.2: Mean Income by Ethnicity and Gender of Heads of Households

Figure 3.3 presents the gender differentials in income by education level of heads of households. On the basis of t-test, the mean income for male heads of households is found to be significantly higher than that of their female counterparts (p<0.05) for all education levels except those with upper secondary education. Largest income differential occurs among those with tertiary education. However, the sample for those with tertiary education is small especially for female household heads (only 93). Income differentials between men and women are due to occupational differences, even among those with tertiary education.

Figure 3.3: Mean Income by Education Level and Gender of Heads of Households
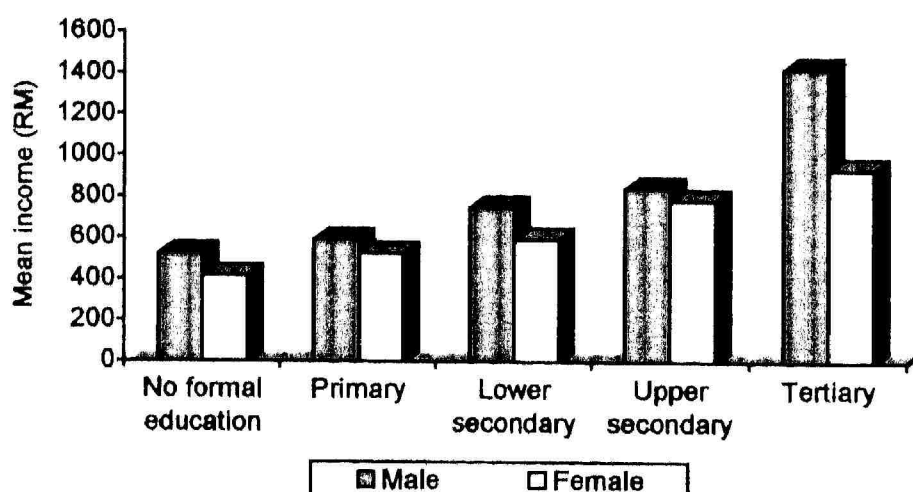
3.4 INCOME DIFFERENTIALS BY AGE OF HEADS OF HOUSEHOLDS

Data show little variation in income level of household heads across age groups, with the exception of those aged 60 years and older, whose income is generally lower than the rest (see Table 3.5). The mean income and median income is highest among the 30-39 age group and lowest among those aged 60 years and older. Chi-square test

shows a significant relationship between age of heads of households and their income

(p<0.01). The Gini coefficient increases with age, ranging from 0.3105 to 0.3867. In

other words, the degree of inequality of income distribution is lowest among household

heads that are less than 30 years of age and highest among the older persons.

Table 3.5: Percentage Distribution of Heads of Households by Income Category, According to Age Group, With Mean Income, Median Income and Gini Coefficient for Each Age Group

	Age Group				
	<30	30–39	40–49	50–59	≥60
Income group (RM)					
<200	3.2	2.3	2.9	5.7	14.3
200–399	27.5	24.0	25.4	8.1	41.2
400–599	33.4	28.8	28.3	26.6	23.4
600–999	23.7	28.0	25.7	24.6	13.4
≥1000	12.2	16.9	17.6	14.9	7.7
Total	100(524)	100(1494)	100(1876)	100(2027)	100(2100)
Mean income (RM)	588.0	682.5	668.7	638.0	466.0
Median income* (RM)	515.6	564.6	553.4	521.8	373.3
Gini coefficient	0.3105	0.3257	0.3324	0.3573	0.3867

Note: * Calculated from the group data

3.5   ETHNIC DIFFERENTIALS IN INCOME

Wide variations in the income of household heads are noted across the three

main ethnic groups (Table 3.6). While as many as 40.4 percent of Chinese heads of

households reported a monthly income of RM600 to RM999, only 21.1 percent of

Malays and 21.8 percent of Indians are in this income category. On the other hand,

32.4 percent of Malays and 26.2 percent of Indians earn between RM200 to RM399 in

contrast to 3.7 percent of Chinese. The mean income of Chinese heads of households is

significantly (p<0.01) higher than that of Malays and Indians while the mean income of

Malays and Indians are not significantly different (p = 0.297). Chi-square test shows a

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significant association between income level and ethnicity (p<0.01). Such differentials could be due to other factors such as occupation, to be investigated in the multivariate context in the following analyses. The extent of income inequality is relatively more serious among the Malays (Gini Coefficient of 0.3627). As for the Chinese, income inequality is much less serious, as indicated by the low Gini Coefficient (0.1139).
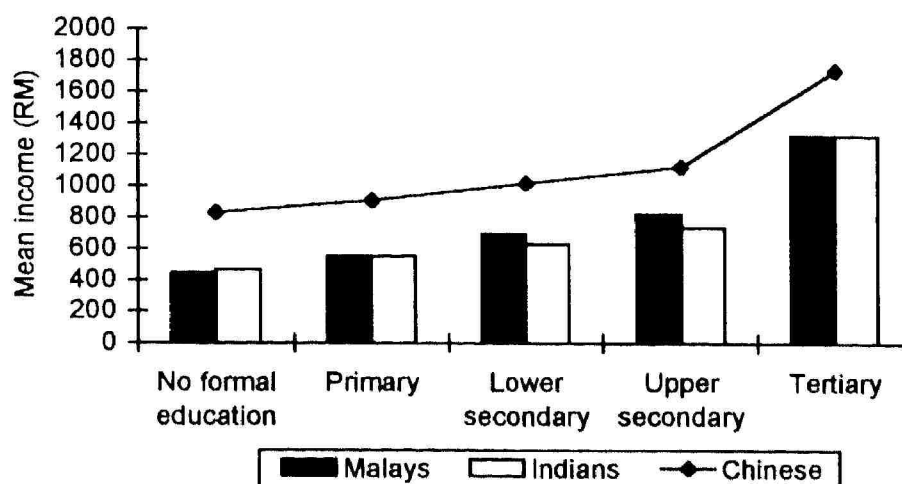
Table 3.6: Percentage Distribution of Heads of Households by Income Category, According to Ethnicity, With Mean Income, Median Income and Gini Coefficient for Each Ethnic Group

	Ethnicity		
	Malays	Chinese	Indians
Income group (RM)			
<200	7.0	0.2	6.7
200–399	32.4	3.7	26.2
400–599	27.4	17.4	37.3
600–999	21.1	40.4	21.8
≥1000	12.0	38.3	7.9
Total	100(7191)	100(592)	100(252)
Mean income (RM)	581.2	919.1	551.8
Median income[a] (RM)	477.4	884.2	491.7
Gini coefficient	0.3627	0.1139	0.3033

Note: [a] Calculated from the group data

Figure 3.4 shows that for every education level, mean income is highest among the Chinese while the mean income of the Malay heads of households is not significantly different from that of their Indian counterparts.

Figure 3.4: Mean Income by Education Level and Ethnicity
of Heads of Households

Mean income (RM)

```
2000
1800
1600
1400
1200
1000
 800
 600
 400
 200
   0
      No formal   Primary    Lower      Upper      Tertiary
      education              secondary  secondary
```

■ Malays ☐ Indians ◆ Chinese

In examining ethnic differentials in income within the agriculture and non-agriculture sector, it is found that mean income for Chinese is still highest regardless of the occupation of the heads (Figure 3.5). For the agriculture sector, the mean income for Malays (RM508.6) is slightly higher than that of the Indians (RM488.4); while the reverse is true for the non-agriculture sector (RM775.1 for the Indians against RM741.3 for the Malays). Wider ethnic differential in income, about RM441 (between the Chinese and Indians) can be observed in the agriculture sector as compared to the non-agriculture sector (RM186.0 between Chinese and Malays).

Figure 3.5: Mean Income By Occupation and Ethnicity of Heads
of Households
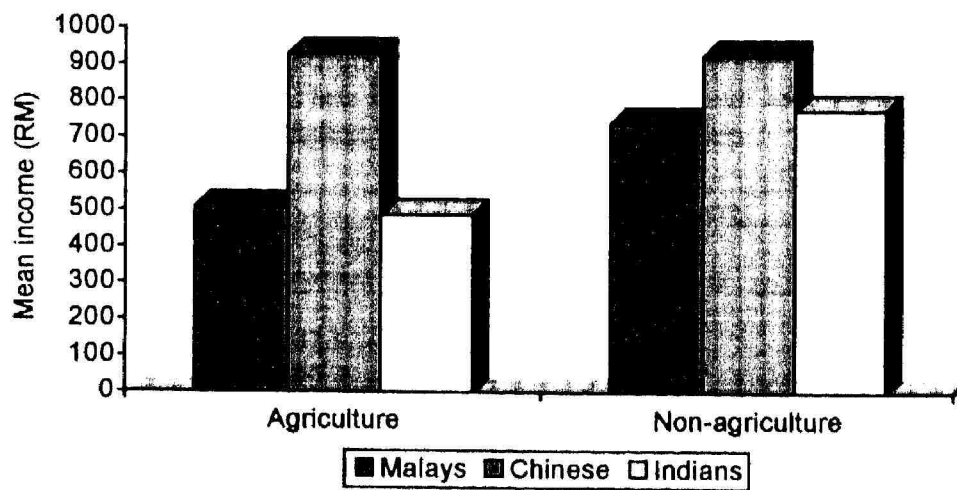
3.6 INCOME DIFFERENTIALS BY EDUCATION LEVEL OF HEADS OF HOUSEHOLDS

Next, we will look at the income patterns by education level. Monthly income level of heads of households is found to be correlated with educational level (r=0.26, p<0.01). In this sample, 40.3 percent of those who have no formal education earn between RM200 to RM399. On the other hand, 63.4 percent of heads who have tertiary education earn at least RM1000 per month (see Table 3.7). The Gini coefficient is highest (0.3782) among those who have no formal education; implying that their income inequality is more serious compared to those with higher education. Heads of households who have tertiary education have the highest income and lowest inequality of income within the group.

Figure 3.6 shows strong positive correlation between income and education at every age. Among heads of households who are between 30 and 60 years of age, the
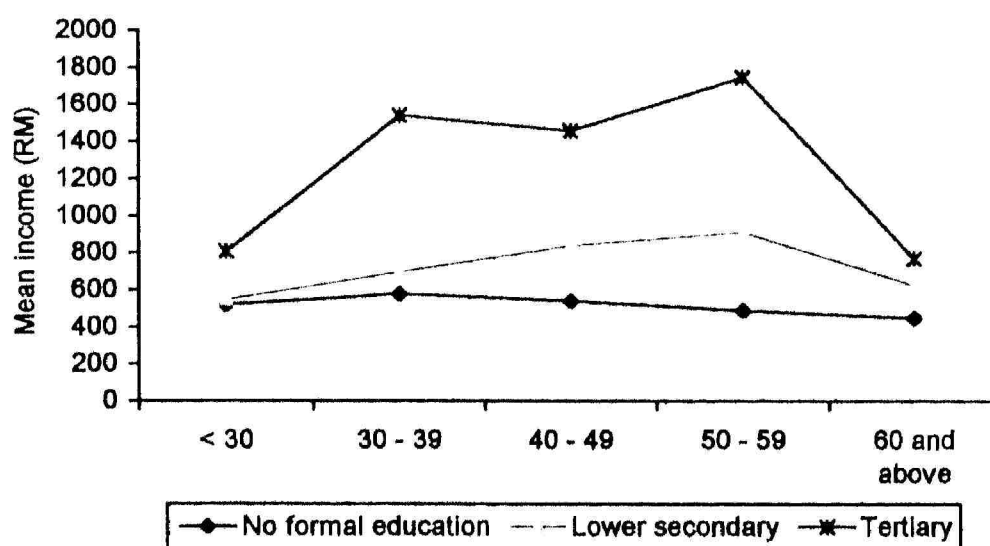
sharpest income differential is found between those with lower secondary education and those with tertiary education.

Table 3.7: Percentage Distribution of Heads of Households by Income Category, According to Their Education Level, With Mean Income, Median Income and Gini Coefficient for Each Educational Group

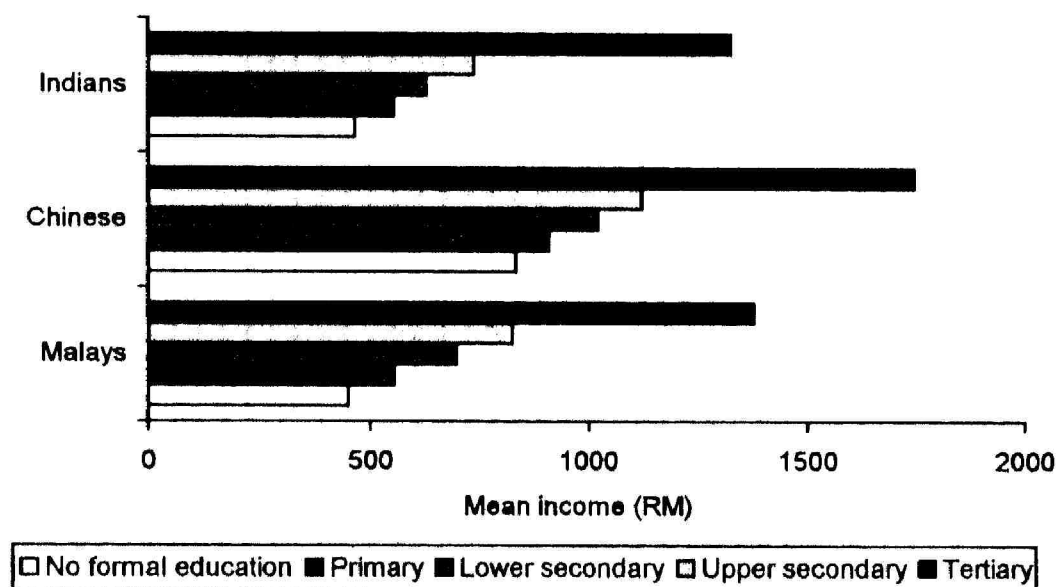|	Education Level				
	No formal education	Primary	Lower secondary	Upper secondary	Tertiary
Income group (RM)					
<200	12.5	5.2	1.8	1.3	0.0
200–399	40.3	29.9	20.4	13.9	7.7
400–599	24.7	29.5	27.8	23.4	9.2
600–999	14.8	24.0	29.4	32.3	19.7
≥1000	7.6	11.5	20.6	29.1	63.4
Total	100(2340)	100(4012)	100(814)	100(743)	100(142)
Mean income (RM)	479.9	583.0	728.5	835.6	1381.4
Median income[a] (RM)	386.1	501.0	600.0	741.2	1211.4
Gini coefficient	0.3782	0.3286	0.3184	0.2999	0.2216

Note: [a] Calculated from the group data

Figure 3.6: Mean Income by Age Group and Selected Education Levels of Heads of Households

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In examining the income differentials by ethnicity and education level, it is observed that mean income increases sharply by educational level for all ethnic groups (see Figure 3.7). The sharpest increment occurs between those in transition from upper secondary to tertiary levels. Differences in mean income between those with no formal education and tertiary education ranges from RM858.8 among the Indians to RM910 among the Chinese and RM926 among the Malays.

Figure 3.7: Mean Income by Ethnicity and Education Level of Heads of Households

Wider income differentials by education level are found among those in the non-agriculture sector as compared to the agriculture sector (Figure 3.8). For heads of households who are engaged in agricultural activities, the mean monthly income ranges from RM491.2 among those with no formal education to RM863.8 among those with tertiary education. In contrast, in the non-agriculture sector, the mean monthly income

ranges from RM521.6 among those with no formal education to RM1528.4 among those with tertiary education.

Figure 3.8: Mean Income by Occupation and Education Level of Heads of Households
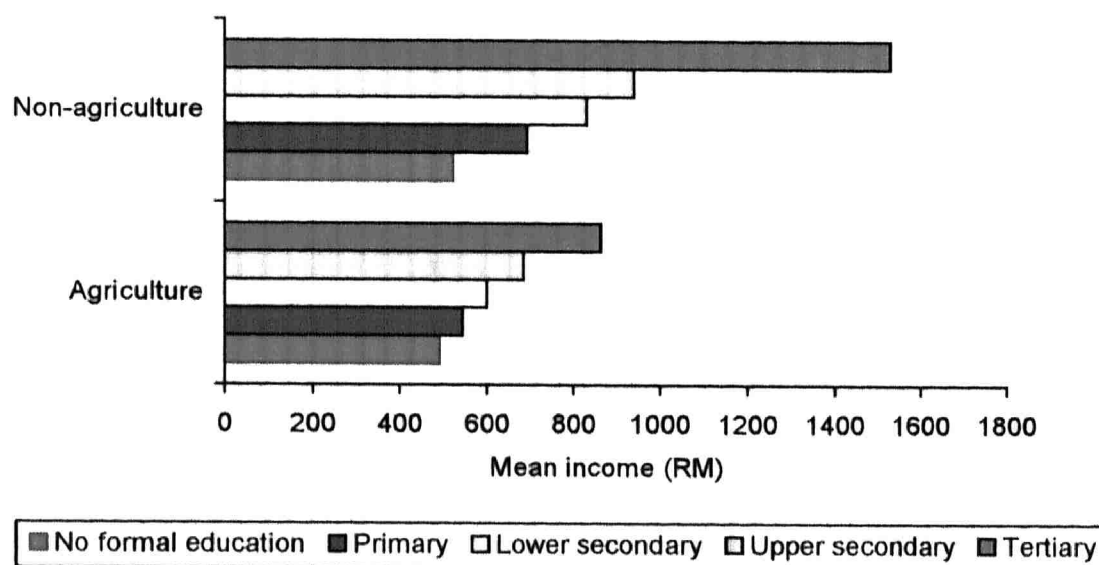
3.7 **INCOME DIFFERENTIALS BY OCCUPATION OF HEADS OF HOUSEHOLDS**

The Chi-square test shows that income level is significantly related to the type of work performed by heads of households ($p<0.01$). From Table 3.8, government servants in the study areas have the highest mean income (RM926.6), followed by the businessmen (RM854.4), while the other agricultural workers have the lowest mean income (RM383.4). More than half of the other crop growers and other agricultural workers earn less than RM400 per month. Apart from businessmen and government servants, very few household heads have a monthly income of at least RM1,000.

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Table 3.8: Percentage Distribution of Heads of Households by Income Category, According to Their Occupation, With Mean Income, Median Income and Gini Coefficient for Each Type of Occupation

	Occupation									
Income group (RM)	Paddy farmers	Rubber tappers	Oil palm growers	Other crop growers	Livestock keepers / estate workers / fishermen	Other agricultural workers	Business men	Factory workers	Government servants	Other non-agricultural workers
<200	3.2	5.2	3.4	12.7	3.8	10.0	0.8	1.0	0.6	7.8
200–399	34.9	16.1	24.6	52.0	34.4	55.9	11.4	12.6	5.5	26.1
400–599	29.0	23.2	38.4	21.1	26.8	23.1	26.9	31.4	26.7	23.8
600–999	18.8	44.5	23.4	11.7	27.1	7.7	28.5	39.5	32.1	29.5
≥1000	14.2	10.9	10.2	2.5	7.9	3.3	32.4	15.4	35.0	12.8
Total	100(1802)	100(211)	100(667)	100(750)	100(369)	100(700)	100(516)	100(382)	100(834)	100(1134)
Mean income (RM)	638.2	634.9	588.2	371.6	531.6	383.4	854.4	678.4	926.6	618.5
Median income[a] (RM)	482.1	649.4	514.6	348.6	488.1	343.1	753.0	650.6	814.3	535.3
Gini coefficient	0.3747	0.2224	0.3036	0.2748	0.2866	0.2911	0.2909	0.2320	0.2647	0.3573

Note: [a] Calculated from the group data.

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However, the rubber tappers in this sample seem to earn more than workers in oil palm plantations. This may partly due to the fact that most of them (74.5%) having supplementary job (see Chapter 2, Table 2.13). Data show that 44.5 percent of the former earn between RM600 to RM999 compared to the 23.4 percent among the latter. Income inequality is relatively more serious among paddy farmers (Gini coefficient of 0.3747). The Gini coefficients also indicate that the degree of income inequality is low among the rubber tappers and factory workers. On a broad occupational basis, wider differential is observed between the agriculture and non-agriculture income. Table 3.9 shows that for heads of households who are engaged in the agriculture activities, 20.7 percent fall in the poorest 20 percent income group and 12.8 percent in the richest 20 percent income group. In contrast, among those who are engaged in the non-agriculture activities, less than 10 percent fall in the poorest 20 percent income group while 31 percent fall in the richest 20 percent income group.

Table 3.9: Income Strata According to Broad Category of
Occupation of Heads of Households

Income Group	Occupation	
	Agriculture	Non-agriculture
Bottom 20%	20.7	9.5
Bottom 40%	44.6	19.2
Middle 40%	42.6	49.8
Top 20%	12.8	31.0

Mean income for non-agriculture sector is significantly higher ($p<0.01$) than that of agriculture sector for all age groups except the oldest age group (see Figure 3.9). In the case of the oldest age group, average income for agriculture sector

(RM487.1) is slightly higher than that of non-agriculture sector (RM469.7). However, such differential is insignificant (p=0.2655).

Figure 3.9: Mean Income by Age and Occupation of Heads of Households
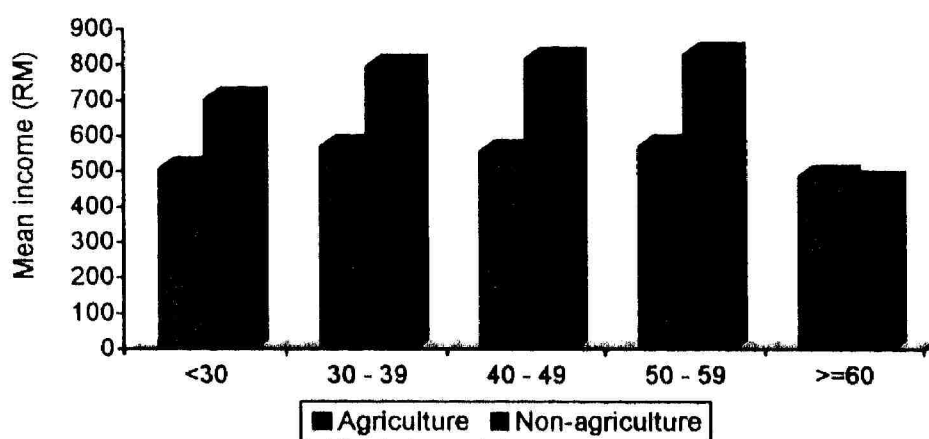
Among the Chinese heads of households, mean incomes for agriculture and non-agriculture sector are about the same (p=0.477). However, for the Indians and Malays, mean monthly income for non-agriculture sector is significantly higher (p<0.01) than that of agriculture sector (see Figure 3.10). The sharpest differential in income between the agriculture and non-agriculture can be observed among the Indians (RM286.7).

Figure 3.11 shows that among those with no schooling, the mean income of household heads in the non-agriculture sector is not significantly different from that of their counterparts in the agriculture sector (p=0.117). For non-agriculture sector, the rate of increase of mean income with respect to education level is higher as compared to that of non-agriculture sector. Thus, as the education level increases, the difference in mean income between the agriculture and non-agriculture sector would also increase.

Figure 3.10: Mean Income By Ethnicity and Occupation
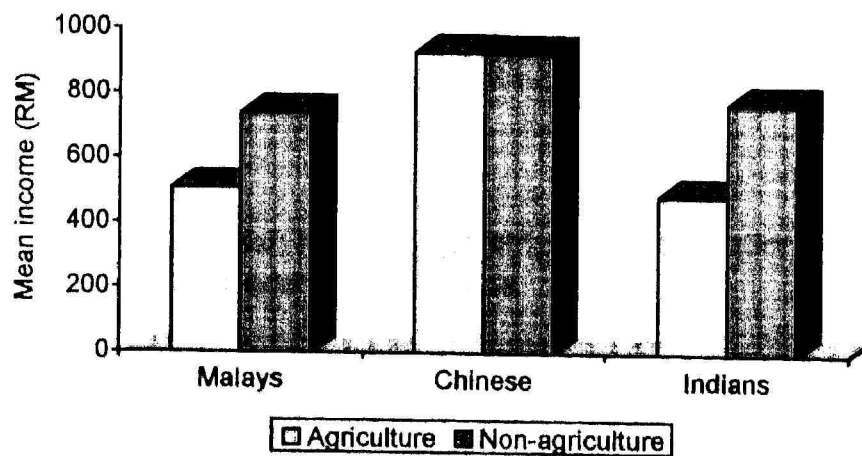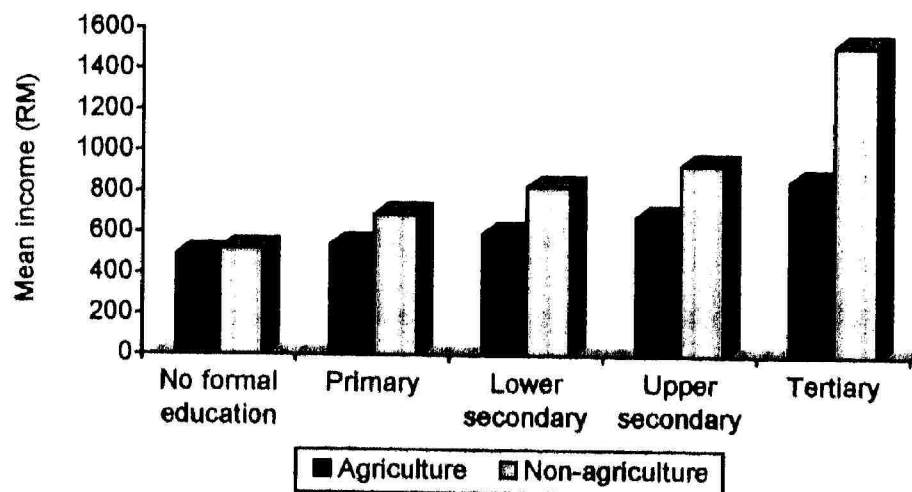of Heads of Households

Figure 3.11: Mean Income By Education Level and
Occupation of Heads of Households

In comparing the income for agriculture and non-agriculture sector by districts, Figure 3.12 shows that in Klang, the mean income for non-agriculture is almost twice as high as that of agriculture sector. Income differential between the two sectors is least pronounced in Sabak Bernam.

Figure 3.12: Mean Income By District and Occupation of Heads of Households
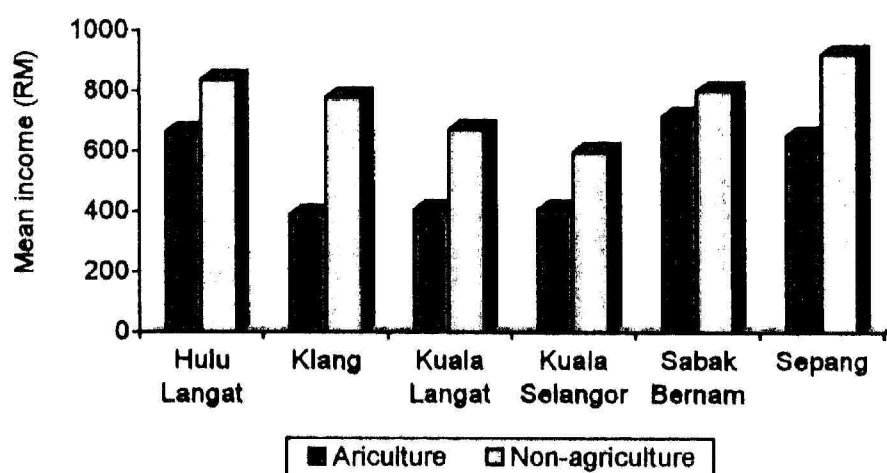
3.8 INCOME DIFFERENTIALS BY DISTRICT

The level of income is found to vary significantly across districts. Table 3.10 indicates that heads of households from Sabak Bernam and Sepang constitute 58 percent of the top 20 percent income group. As for heads of households in the bottom 20 percent income group, about 52 percent are from Kuala Selangor. The heads of households in Sepang reported the highest mean income, followed by Sabak Bernam. On the other hand, heads of households in Kuala Selangor reported the lowest income. Table 3.11 shows that 42.8 percent hold heads from Kuala Selangor earn between

RM200 to RM399, as compared to only 16.0 percent from Hulu Langat and 14.8 percent from Sepang. On the other hand, slightly more than half of the heads from Sepang and Hulu Langat earn more than RM600, but only about 20 percent from Kuala Langat and Kuala Selangor are in this income category. Based on the Gini coefficient, Kuala Langat has the lowest degree of inequality of income (Gini coefficient of 0.2865) among heads of household, while income inequality is most serious in Sabak Bernam (Gini coefficient of 0.3825).

Table 3.10: Composition of Heads of Households by District in the Bottom 20% and Top 20% Income Group

District	Income Group	
	Bottom 20%	Top 20%
Hulu Langat	6.3	12.7
Klang	11.0	9.7
Kuala Langat	4.4	2.0
Kuala Selangor	51.6	17.7
Sabak Bernam	18.9	2.3
Sepang	7.1	25.7

Table 3.11: Percentage Distribution of Heads of Households by Income Category, According to District, With Mean Income, Median Income and Gini Coefficient for Each District

	District					
	Hulu Langat	Klang	Kuala Langat	Kuala Selangor	Sabak Bernam	Sepang
Income group (RM)						
<200	3.7	10.4	6.1	8.1	5.0	2.8
200–399	16.0	23.6	34.6	42.8	26.8	14.8
400–599	24.3	27.0	39.4	28.6	22.9	26.3
600–999	36.4	25.9	13.6	14.4	22.3	35.5
≥1000	16.6	13.1	6.3	4.1	23.0	20.5
Total	100(687)	100(771)	100(814)	100(3015)	100(1802)	100(1320)
Mean income (RM)	686.8	594.0	467.7	460.7	730.4	774.0
Median income[a] (RM)	633.0	518.5	447.2	395.8	559.0	668.9
Gini coefficient	0.3087	0.3452	0.2865	0.3133	0.3825	0.3479

Note: [a] Calculated from the group data

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3.9 MULTIVARIATE ANALYSIS OF INCOME

Income differentials are a function of a multitude of factors. Multivariate analyses are performed to examine the combined effects of some of the pertinent variables, and to assess the independent effects of each of these factors. As income is measured in ratio scale, multiple classification analysis (MCA) and multiple regression are the appropriate statistical techniques. In this section, the 'Others' ethnic group is excluded from the analyses because of its small sample size.

3.9.1 Analysis of Variance (ANOVA) and Multiple Classification Analysis (MCA)

The analysis of variance decomposes the total variations of the dependent variables into 2 components-- between group differences and within group differences. The technique is used to test if the differences in group means are statistically significant or not. Table 3.12 shows that the F values are rather large ($p<0.01$). Each of the seven explanatory variables; namely age, gender, ethnicity, education level, occupation, district and household size has statistically significant effect on income. Two-way interactions are mostly insignificant and as such, MCA, which is an additive model, is an appropriate technique for analyzing the income differentials within the multivariate context.

Table 3.12: Analysis of Variance (ANOVA) on Total Monthly Income of Heads of Households by Selected Variables

Sources of Variation	Hierarchical Method			
	Sum of Squares	DF	Mean Square	F
Main effects	4.7E+08	28	1.7E+07	76.05
Age	5.1E+07	4	1.3E+07	55.77
Gender	2.0E+07	1	2.0E+07	87.64
Ethnicity	5.6E+07	2	2.8E+07	122.82
Education level	1.5E+08	4	3.6E+07	160.80
Occupation	1.1E+08	9	1.2E+07	51.75
Household size	4787055	2	2393527	10.55
District	8.3E+07	5	1.7E+07	73.42
Summary				
Explained	4.7E+08	27	1.7E+07	76.05
Residual	1.6E+09	7128	226876.0	
Total	2.1E+09	7155	291132.3	

Note: All F values are significant at less than 1 percent level

Table 3.13 presents the 'full' model of MCA. The eta values show the degree of association between mean income and the independent variables with several categories. The beta values show the relative importance of each explanatory variable net of the effects of other variables in the model. In the 'full' model, with seven independent variables, occupation stands out as the most important explanatory variable; education level, district and ethnicity are next in importance, in that order. The educational effects remain very significant even after controlling for all other variables in the model. The educational variable has the highest beta coefficient (0.228), followed closely by occupation (0.224). Age, gender, and household size are variables of less importance. Their rankings of importance, fifth, sixth and seventh are the same before and after adjusting for other factors. As a whole, the seven variables explain 22.4 percent of the variations in income.

Table 3.13: Multiple Classification Analysis (MCA) of Total Monthly Income of Heads of Households by Selected Variables

Variable	N	Unadjusted mean	Eta	Adjusted mean	Beta
Age			0.156		0.092
<30	474	613.27		501.65	
30–39	1391	697.65		607.27	
40–49	1748	674.80		653.16	
50–59	1787	652.84		676.98	
≥60	1756	478.72		577.40	
Gender			0.103		0.073
Male	5665	649.99		641.69	
Female	1491	513.54		545.09	
Ethnicity			0.169		0.163
Malays	6334	596.04		594.43	
Chinese	576	928.27		917.70	
Indians	246	560.65		626.70	
Education level			0.281		0.228
No formal education	2026	496.87		560 .99	
Primary	3556	593.93		577.24	
Lower secondary	764	734.13		692.54	
Upper secondary	677	857.88		820.56	
Tertiary	133	1410.31		1308.51	
Occupation			0.308		0.224
Paddy farmers	1751	644.42		694.59	
Rubber tappers	166	575.70		514.95	
Oil palm growers	643	585.44		528.03	
Other crops growers	745	368.59		475.11	
Livestock keepers / estate workers / fishermen	365	529.90		483.17	
Other agricultural workers	691	381.56		473.08	
Businessmen	494	851.84		783.76	
Factory workers	365	672.89		623.94	
Government servants	819	928.74		827.81	
Other non-agricultural workers	1116	616.72		587.88	
Household size			0.084		0.050
1–3	791	493.00		548.37	
4–6	2781	633.59		621.86	
>6	3584	640.60		637.48	
District			0.254		0.215
Hulu Langat	424	718.86		726.34	
Klang	679	608.87		621.48	
Kuala Langat	391	469.90		570.55	
Kuala Selangor	2720	474.79		499.18	
Sabak Bernam	1718	747.08		660.64	
Sepamg	1224	793.33		818.71	
R = 0.473	$R^2 = 0.224$				

Next, we will examine income differentials by each of the factors, unadjusted and adjusted for other variables. Table 3.14 shows that at the bivariate level, income increases with age up to the age of 39 before reversing. This pattern exists after controlling for gender, household size, ethnicity and district. Further controlling for education level in the model changes the pattern of income. Mean income for those below 30 years would be less than RM500, but it increases up to age 59 before reversing the upward trend. The reduction in income among the younger respondents with the introduction of the educational variable can be explained by the fact that they have higher education (which in itself is associated with higher income). Hence controlling the educational level would have removed their comparative advantage. With the exception of the 40-49 age group, controlling for all other variables in the model increases slightly the mean income for all age groups and reduces the differential in income.

Table 3.14: Mean Income (RM) by Age Group, Unadjusted and Adjusted by Selected Variables

Variables Controlled	Age Group					Difference
	<30	30–39	40–49	50–59	≥60	
None	588.03	682.48	668.70	637.98	465.96	216.52
Gender, household size	619.12	682.59	658.31	625.66	465.27	217.32
Plus ethnicity	610.46	677.08	654.41	625.84	475.26	201.82
Plus district	623.58	688.78	658.00	615.70	473.45	215.33
Plus education level	467.61	605.93	655.54	654.74	537.11	187.97
Plus occupation	501.65	607.27	653.16	676.98	577.40	175.33

As for the effects of gender on income (Table 3.15), the unadjusted mean for male heads of households is RM638.62 compared to RM487.58 for female heads of households. The gender difference in mean income drops from RM151.04 to RM96.61

after adjusting for all other variables in the model. A large part of the differentials in income by gender can be explained by education level and type of occupation. In this study, the income for female heads may be under-reported due to the use of a rather narrow income measure. Previous studies show that the imputed value of housework and value of cooking and childcare have been found to add RM3164 to the average annual household's income of Malaysians (Kusnic, Da Vanzo, 1980, pp.3-9).

Table 3.15: Mean Income (RM) by Gender, Unadjusted and Adjusted by Selected Variables

Variables Controlled	Gender		Difference
	Male	Female	
None	638.62	487.58	151.04
Age, household size	630.25	501.19	129.06
Plus ethnicity	632.45	493.97	138.48
Plus district	634.69	490.80	143.89
Plus education level	626.32	520.04	106.28
Plus occupation	641.69	545.09	96.61

Turning now to look at the household size differentials in income, the mean income increases from RM457.89 for households with 1-3 members to RM625.23 for households with more than 6 members (Table 3.16). Adjusting for other variables in the model reduces the differentials in income by household size, but mean income is still positively related to household size.

Table 3.16: Mean Income (RM) by Household Size, Unadjusted and Adjusted by Selected Variables

Variables Controlled	Household Size			Difference
	1-3	4-6	>6	
None	457.89	615.31	625.23	167.34
Age, gender	490.59	596.28	632.52	141.93
Plus ethnicity	502.18	596.80	629.48	127.30
Plus district	519.70	599.36	624.92	105.22
Plus education level	512.02	597.48	628.00	115.98
Plus occupation	548.37	621.86	637.48	89.11

In terms of ethnicity, Table 3.17 shows that the Chinese have the highest income (RM919.06), followed by the Malays (RM581.18) and the Indians (RM551.75). Income differentials by ethnic group remain practically unchanged after controlling for other variables. It is found that there is only a slight drop in mean income for the Chinese and a marginal increase in mean income for the Malays after taking into account their compositional differences in other variables. Among the Indians, the increase in means is relatively greater compared to the Malays. In other words, net of the effects of other variables, the income level is lowest among the Malay heads of households (RM59743) and highest for the Chinese (RM917.70). Part of the ethnic differentials in income may be attributed by differences in the type of occupation.

Table 3.17: Mean Income (RM) by Ethnicity, Unadjusted and Adjusted by Selected Variables

Variables Controlled	Ethnicity			Difference
	Malays	Chinese	Indians	
None	581.18	919.06	551.75	367.31
Age, gender, household size	579.01	900.39	535.80	364.59
Plus district	583.78	865.78	506.19	359.59
Plus education level	580.62	887.42	542.60	344.82
Plus occupation	594.43	917.70	626.70	323.27

Table 3.18 presents income differentials by district. The sharpest income differential is observed between Kuala Selangor and Sepang. In this sample, household heads in the farming communities in Kuala Selangor have the lowest mean income (RM463.03), while those in Sepang have the highest mean income of RM770.74. Adjusting for other variables in the model consecutively would have resulted in increase in the mean income for these two districts. A rather different pattern is noted for Sabak Bernam where mean income declines from RM730.42 to RM660.64 after controlling for the effects of other variables in the model.

Table 3.18: Mean Income (RM) by District, Unadjusted and Adjusted by Selected Variables

Variables Controlled	District						Difference
	Hulu Langat	Klang	Kuala Langat	Kuala Selangor	Sabak Bernam	Sepang	
None	686.84	593.95	467.68	460.70	730.42	773.97	313.27
Age, gender, household size	684.97	581.28	448.90	463.03	732.60	770.74	321.84
Plus ethnicity	703.50	598.92	466.99	473.35	679.90	796.93	329.94
Plus education level	668.29	573.27	493.33	486.14	684.34	783.23	297.09
Plus occupation	726.34	621.48	570.55	499.18	660.64	818.71	319.53

Educational attainment produces sharp differentials in income (see Table 3.19). Among those with tertiary education, mean income is RM1381.42 and at the other extreme, mean income is only RM479.86 among those with no formal education. Adjusting for all other variables in the model reduces the difference in mean income from RM901.14 to RM747.52, reflecting the effects of other variables. Mean income increases according to education level, even after adjusting for the variations in other

variables. The type of occupation explains part of the differentials in income by education level.

Table 3.19: Mean Income (RM) by Education Level, Unadjusted and Adjusted by Selected Variables

Variables Controlled	Education Level					Difference
	No formal education	Primary	Lower secondary	Upper secondary	Tertiary	
None	479.86	582.95	728.49	835.60	1381.42	901.14
Age, gender, household size	505.03	552.88	737.93	864.25	1389.78	884.75
Plus ethnicity	499.58	552.20	735.40	883.90	1417.35	917.77
Plus district	523.49	549.74	711.50	862.19	1383.53	860.04
Plus occupation	560.99	577.25	692.54	820.56	1308.51	747.52

Next, we will assess the effect of occupation in income (see Table 3.20). Before adjustment, there is a large differential (RM554.92) in mean income ranging from RM371.64 for other crops growers to RM926.56 for the government servants. Controlling for age, gender and household size reduces the differentials slightly. Further controlling for ethnicity, district and education level reduces the occupation differentials to only RM354.73. A large part of the effect of occupation in income is attributed to differences in educational level of the household heads. Government servants maintain their income premium over other occupational groups even after controlling for all other variables in the model.

Table 3.20: Mean Income (RM) by Occupation, Unadjusted and Adjusted by Selected Variables

Variables Controlled	Occupation										Difference
	Paddy farmers	Rubber tappers	Oil palm growers	Other crop growers	Livestock keepers / estate workers / fishermen	Other agricultural workers	Business men	Factory workers	Government servants	Other non-agricultural workers	
None	638.22	634.87	588.19	371.64	531.58	383.40	854.44	678.41	926.56	618.48	554.92
Age, gender, household size	650.01	601.86	583.86	394.70	510.40	380.15	838.32	660.23	889.74	620.94	509.59
Plus ethnicity	643.20	622.08	586.10	407.28	482.47	397.5	806.01	677.92	912.68	610.69	511.13
Plus district	681.61	491.71	513.87	460.56	452.46	460.08	759.67	628.62	911.39	582.22	458.93
Plus education level	694.59	514.95	528.03	475.11	483.17	473.08	783.76	623.94	827.81	587.88	354.73

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3.9.1 Regression Analysis

In regression analysis, the dependent variable is the natural logarithm of income. Data transformation is carried out in view of the fact that income is not normally distributed (see Figure A.1 in Appendix II), to satisfy the normality assumptions. It is a common assumption in the literature that income is log-normally-distributed (Kusnic, DaVanzo, 1980, p.77). The explanatory variables are age, age-squared, gender, ethnicity, education level, occupation, district and household size. There is a non-linear relationship between age and income (see Figure A.2 in Appendix III) and therefore age quadratic is included in the income regression. Four variables that are not measured in interval scale are recoded into dummy variables for inclusion in the regression equation. The dummy variables and their respective reference categories are shown in Table 3.21.

Table 3.21: Dummy Variables and the Corresponding
Reference Categories

Dummy variable	Reference category
Gender	Female
Ethnicity	Indians
Education level	Tertiary
Occupation	Other non-agricultural workers
District	Sepang

The result of regression analysis is presented in Table 3.22. The value of R^2 shows that all the explanatory variables entered in the model explain 33.7 percent of the variation in the logarithm of income. All the coefficients are significant except for livestock keepers/estate workers/fishermen and Klang. F-statistic is large (173.6) with

small p-value (p<0.001), indicating the overall significance of the estimated regression. The estimated equation obtained is :

ln(income) = 6.026 + 0.028(age) − 0.0003(age^2) + 0.214(male) − 0.072(Malay) +

0.672(Chinese) − 0.534(no formal education) − 0.498(primary) −

0.414(lower secondary) − 0.325(upper secondary) + 0.297(paddy

farmers) + 0.155(rubber tappers) + 0.161(oil palm growers) −

0.101(other crop growers) − 0.015(livestock keepers) − 0.11(other

agricultural workers) + 0.507(businessmen) + 0.296(factory workers) +

0.639(government servants) − 0.018(Klang) − 0.245(Kuala Langat) −

0.287(Kuala Selangor) − 0.155(Sabak Bernam) + 0.026(household size)

Histogram and P-P plot of regression standardized residual (see Figure A.3 and A.4 in Appendix IV) show that the error (disturbance) term is approximately normally distributed. Heteroscedasticity does not seem to pose serious problem in violating the assumptions for regression analysis, since the graph of residual squared versus the predicted value does not show a systematic pattern[1] (see Figure A.5 in Appendix V).

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[1] Detection of heteroscedasticity by graphical method, see Damodar N. Gujarati (1995), *Basic Econometrics*, 3rd ed, McGraw-Hill, Inc., New York, pp.367-369.

Table 3.22: Regression Analysis

Dependent variable	:	ln(income)
R	:	0.581
R^2	:	0.337
Adjusted R^2	:	0.335
Standard Error of the Estimate	:	0.5694

ANOVA

	Sum of squares	DF	Mean square	F	Sig.
Regression	1294.9	23	56.301	173.6	0.000
Residual	2542.9	7843	0.324		
Total	3837.8	7866			

Coefficients

Variables	B	Std. error	t	Sig.
(Constant)	6.026	0.096	62.59	0.000
Age	2.802E–02	0.003	9.118	0.000
Agesqu	–3.29E–04	0.000	–11.405	0.000
Male	0.194 (0.214)	0.016	11.475	0.000
Malays	–7.46E–02 (–0.072)	0.039	–1.921	0.055
Chinese	0.514 (0.672)	0.046	11.203	0.000
No formal education	–0.764 (–0.534)	0.053	–14.526	0.000
Primary	–0.689 (–0.498)	0.051	–13.620	0.000
Lower secondary	–0.534 (–0.414)	0.053	–10.144	0.000
Upper secondary	–0.39 (–0.325)	0.053	–7.456	0.000
Rice farmers	0.260 (0.297)	0.021	12.568	0.000
Rubber tappers	0.144 (0.155)	0.048	3.035	0.002
Oil palm growers	0.149 (0.161)	0.028	5.306	0.000
Other crops growers	–0.107 (–0.101)	0.026	–4.182	0.000
Livestock keepers / estate workers / fishermen	1.477E–02 (0.015)	0.035	0.416	0.677
Other agricultural worker	–0.117 (–0.11)	0.026	–4.450	0.000
Businessmen	0.410 (0.507)	0.029	14.093	0.000
Factory workers	0.259 (0.296)	0.034	7.698	0.000
Government servants	0.494 (0.639)	0.025	19.499	0.000
Klang	–1.84E–02 (–0.018)	0.028	–0.651	0.515
Kuala Langat	–0.281 (–0.245)	0.032	–8.711	0.000
Kuala Selangor	–0.338 (–0.287)	0.018	–19.076	0.000
Sabak Bernam	–0.168 (–0.155)	0.023	–7.465	0.000
Household size	2.623E–02	0.002	11.122	0.000

Notes: 1. Excluded variable: Hulu langat. 2. Numbers in parentheses are the percentages in the dependent variable associated with the presence of the characteristic measured by the dummy variables. 3. The relative change in mean income for the dummy variable is obtained by taking the antilog (to base e) of the estimated dummy coefficient and subtract 1 from it (Halvorsen and Palmquist 1980, pp.474-475).

The regression model shows that the estimated impact on predicted income of a one-unit change in age is 0.028 − 0.0007(age). Mean income of male is higher than female by 19.4 percent. Compared to the mean income of Indians, mean income of Malays is 7.46 percent lower and for Chinese, 67.2 percent higher. Mean income is highest among heads of households with tertiary education, where the percentage point difference between them and their counterparts with lower educational attainment ranges from 32.5 to 53.4. In terms of occupation, government servants have the highest income, followed by businessmen. Mean income for government servants is 63.9 percent higher than other non-agricultural workers. The coefficients of Klang, Kuala Langat, Kuala Selangor and Sabak Bernam are negative. In other words the mean income from these districts are lower than that of Sepang.

3.10 SUMMARY

The findings and analyses in this chapter show that the income level is rather low for most households in the farming communities in Selangor. As in the case of other parts of the country, income inequality also exists in the sample population. Income of household heads is relatively higher for the male heads of households as compared to their female counterparts, the Chinese as compared to Malays and Indians, those with tertiary education as compared to those with lower educational level, those working in the non-agriculture sector especially the government servants and those from the district of Sepang. Pronounced income differential can be observed across ethnic groups, education level and occupation. Education level of head of household is found to be the most important variable in explaining the variations in income.