Nutritional Assessment of Pre-School Children in Rural Villages of the Family Dynamics, Lifestyles and Nutrition Study (1997-2001)

I. Socio-Economic Status of Households

Chee Heng Leng[1], Khor Geok Lin[2], Fatimah Arshad[3] and Wan Abdul Manan Wan Muda[4], Ahmad Affendi Shabdin[5], Asnarulkhadi Abu Samah[6], Rohani Abdullah[7], Siti Jamilah Bidin[5], Zahid Emby[6] & Zamaliah Mohd Marjan[2]

[1]   *Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor*
[2]   *Department of Nutrition and Health Sciences, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor*
[3]   *Department of Nutrition and Dietetics, Faculty of Allied Health Sciences, Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, 50300 Kuala Lumpur*
[4]   *School of Health Sciences, Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan*
[5]   *School of Languages and Scientific Thinking, Universiti Utara Malaysia, 06010 Sintok, Kedah*
[6]   *Department of Social Science and Development, Faculty of Human Ecology, Universiti Putra Malaysia, 43400 UPM Serdang Selangor*
[7]   *Department of Family Development Studies, Faculty of Human Ecology, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor*

ABSTRACT

This paper presents the socio-economic profile of households in the Family Dynamics Study (FDS) (1997-2001) and makes comparisons with the earlier Functional Groups Study (FGS) (1992-1996). For the current study, FGS villages with a high prevalence of child malnutrition were purposively selected. In each village selected, all households were included, and interviews with a structured questionnaire were conducted in April-May 1998. Incomes were generally low and incidence of poverty was high; 49.6% of the households were under the poverty line income, of which 37.2% were poor and 12.4% were hard core poor. Overall, only 23.2% of heads of households were in agricultural occupations, others being primarily waged workers and petty traders. Livestock rearing was widespread (57.8%), and most households (90.4%) owned at least one motorised vehicle, the most common being the motorcycle. The majority of households had refrigerators (73.6%), washing machines (58.8%), and televisions (91.1%); but telephones (42.2%), mobile phones (6.1%) and computers (2.3%) were less common. Although 99.7% of households had electricity supply and 95.1% had either a flush or pour flush latrine, only 57.4% had piped water supply. In comparison to the FGS, poverty in the current study is lower (49.6% of FDS households are poor compared to 55.2% of FGS households), the proportion of household heads in agricultural occupations is also lower (26.9% compared to 55.3%), while all other socioeconomic indicators were better, except for piped water supply, which remains inadequate for households in the current study.

INTRODUCTION

The relationship between socio-economic status and nutritional status is well established. It is often shown, for example, that households characterized as having a low socio-economic status or as being below the poverty line generally have higher proportions of undernourished children. In these households, various conditions prevail that contribute to undernutrition in children. Factors that have been identified include inadequate complementary food, poor child feeding practices and intra-household food distribution. Others are inadequate access to health care, lack of safe water and sanitation, as well as high infection levels. (Zamaliah *et al.,* 1998; Wei Luo *et al.,* 2001; Zalilah *et al.,* 2000; Norhayati *et al.,* 1997.)

A recently completed study seeking to explore the reasons for child undernutrition among rural households in Peninsular Malaysia is *The Study on Relationships Between Family Dynamics, Lifestyles and Nutritional Status of Children* (Family Dynamics Study, 1997-2001). Designed as a follow-up to the *Study of Nutritional Status Among Five Major Functional Groups* (Functional Groups Study, 1992-1996) (IMR, UPM & MOH, 1993), the Family Dynamics Study aims to identify the social and behavioral factors that are associated with undernutrition among children in low income rural households, focussing on factors related to intra-family dynamics in child rearing and child feeding practices.

In this paper, the socio-economic data from the Family Dynamics Study is presented. The objective is to provide a descriptive analysis of the socio-economic status of rural households in villages that have been selected for having a high prevalence of child undernutrition. The intention is to provide a context for the understanding of child undernutrition in these households, and the factors that contribute to the high prevalence of undernutrition in these villages. A comparison to the earlier Functional Groups Study is made. Although the lists of villages in the two studies are not exactly the same, nevertheless such a comparison gives a crude indication of changes that have occurred over the last five years in rural villages of the four districts studied.

MATERIALS AND METHODS

The selection of villages for the present study was based on the districts that were covered in the earlier Functional Groups Study (1992-1996) (Chee *et al*., 1997). The Functional Groups Study had targetted five major functional groups with reported high prevalence of poor households, that is, the padi planters, fishermen, rubber and coconut smallholders, and estate workers.

As a follow up study, the Family Dynamics Study purposively selected districts (two for padi, one each for rubber and fishing) that had shown the highest prevalence of child malnutrition in the Functional Groups Study. As far as possible, the same villages that had been covered by the earlier study were included. Nevertheless, in the Kelantan and Terengganu districts, preliminary surveys identified different study villages, giving priority to villages with a high prevalence of malnutrition among preschool children (Wan Abdul Manan, 1998). As such, the final lists of villages in the two studies are not identical.

The first round of data collection was April-May 1998, during which time the socio-economic data presented in this paper was collected. In every village that was selected, all households with at least one child between 12 and 72 months were included in the study. Interviews were conducted by trained research assistants using a structured questionnaire. Whenever possible, the mother of the child or children, who was usually the spouse if not the head of household herself, was sought for interviewing. Data was collected on income, household size, occupation, material possessions, and household amenities.

The Functional Groups Study had selected five districts for padi growing, four for rubber, and four for fishing, but only data from the districts that were selected for the present study was extracted and merged in order to make comparisons. Analysis was carried out by the SPSS Version 10.0. Differences in household size and income between the present and previous studies were tested for significance with the t-test. The chi-square test was used to test the two studies for association with variables of material possession and household amenities.

RESULTS

Location

Table 1 shows the list of villages covered in the Family Dynamics Study, as well as the villages in the corresponding districts of the earlier Functional Groups Study for which data was extracted and used for comparisons in this paper. Two districts were selected as padi areas, and for one of these, Baling, there is considerable overlap of villages between the two studies, while for the other district, Machang, the villages are different. There is also extensive overlapping of the rubber villages in the district of Kuala Kangsar, but the fishing villages are different for the two studies even though they are located in the same district of Kuala Terengganu.[1]

Household size and income

The median household size was constant at 6.0 in all three types of areas although the mean household size varied from 6.1 in fishing villages to 6.5 in padi villages, with an overall mean of 6.4 members (Table 2). Mean monthly household income in padi (RM748) and fishing villages (RM775) did not differ widely, but was considerably higher in rubber villages (RM1211). Even holding household size constant by computing monthly household income on a per capita basis, the mean (RM198) and median (RM163) for rubber villages were higher than either padi or fishing villages: Padi villages had the lowest mean (RM122) and median per capita household income (RM92). The spreads in the income distributions are wide as indicated by the large standard deviations (±RM653 for all groups).

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[1] For convenience, villages in the districts that have been selected as padi areas are referred to as padi villages. Likewise, rubber and fishing villages refer to villages in districts that have been selected as rubber and fishing areas. In each village, there is usually a mix of economic activity, and not all households would be involved in the economic activity for which the village was selected. Nevertheless, all households in padi villages are referred as padi households, whether or not they are involved in padi planting, and likewise households in rubber and fishing villages.

The percentage distribution of monthly household income is presented in Table 3. Overall, nearly three quarters (74.1%) of the households had monthly incomes of RM1000 and below. Padi and fishing villages had considerably higher proportions of households in this category (79.0% each) than rubber villages (55.8%). One-quarter of the rubber households earn more than RM1500 per month.

Table 1. Location of the study villages

State	District	Mukim	Villages
Family dynamics study (1997)			
			Padi
Kedah	Baling	Tawar	Kg. Tawar, Kg. Padang Stol, Kg. Belakang JKR, Kg. Quarters JKR, Kg. Masjid Tawar
		Kupang	Kg. Padang Cina, Kg. Landak Paya, Kg. Hangus
Kelantan	Machang	Pek	Kg. Pangkal Mempelam, Kg. Berangan Mek Nab, Kg. Banggol Kulim, Kg. Tualang Kelikir
			Rubber
Perak	Kuala Kangsar	Sayong	Kg. Rambal Tujuh, Kg. Kerlebor, Kg. Tanah Lapan, Kg. Senawan, Kg. Padang Changkat, Kg. Sg. Siput
			Fishing
Terengganu	Kuala Terengganu	Batu Rakit	Kg. Gong Datok, Kg. Pak Tuyu, Kg. Tanjung Gelam, Kg. Gong Pak Jin, Kg. Padang Nenas
Functional groups study (1992)			
			Padi
Kedah	Baling	Tawar	Kg. Tawar, Kg. Padang Stol, Kg. Charok Purun, Kg. Charok Akar, Kg. Bukit
		Kupang	Kg. Padang Cina, Kg. Landak Jaya, Kg. Hangus, Kg.Tok Soba, Kg. Bukit Hijau
Kelantan	Machang	Pangkal Meleret	Kg. Mengketil, Kg. Peltah, Kg. Tandak, Kg. Chano, Kg. Mata Air, Kg. Limau Hantu, Kg. Gaung, Kg. Jeram
		Hulu Sat	Kg. Kemuning, Kg. Penakah
			Rubber
Perak	Kuala Kangsar	Sayong	Kg. Rambal Tujuh, Kg. Kerlebor, Kg. Tanah Lapan, Kg. Senawan, Kg. Sendayang
			Fishing
Terengganu	Kuala Terengganu	Cabang Tiga Pulau	Kg. Duyung Besar, Kg. Duyung Kecil, Kg. Kelak Aya, Kg. Pulau Ketam

Note: Villages common to both studies are in italics.

Table 2. Mean and median household size and income

	n	Mean household size (±SD)	Median household size	Mean monthly household income (RM) (±SD)	Median monthly household income (RM)	Mean monthly per capita household income (RM) (±SD)	Median monthly per capita household income (RM)
Padi	249	6.5±2.2	6.0	748±577	550	122±93	92
Rubber	120	6.4±2.1	6.0	1211±902	995	198±139	163
Fishing	204	6.1±1.9	6.0	775±469	650	137±85	112
All groups	573	6.4±2.1	6.0	854±653	650	143±105	108

Table 3. Percentage distribution of households according to income

		Monthly household income (RM)				
	n	1-250	>250-500	>500-1000	>1000-1500	>1500
Padi	249	6.4	36.5	36.1	12.0	8.8
Rubber	120	1.7	18.3	35.8	19.2	25.0
Fishing	204	2.5	36.8	39.7	13.2	7.8
All groups	573	4.0	32.8	37.3	14.0	11.9

Per capita household income is shown in Table 4 and Figure 1. It can be seen that the majority of padi households (42.2% and 18.1%) had monthly incomes that were RM107 per capita or less, while the fishing households had a better spread with larger proportions in the >RM107 - RM150 (20.1%) and the >RM150 - RM250 categories (21.6%), even though the majority (38.7%) were in the >RM54 - RM107 category. The income distribution of rubber households tended toward a higher range, with higher proportions in the >RM150 - RM250 (28.3%) and >RM250 categories (24.2%) compared to the >RM54 - RM107 (24.2%) and >RM107 - RM150 categories (18.3%).

Poverty households

The Eighth Malaysia Plan (Malaysia, 2001) has set the 1998 poverty line income in Peninsular Malaysia to be RM493 per month for a household of 4.6, which works out to be RM107 per capita. The hard core poverty line was set at half of this, that is, RM54 per capita monthly household income. On this basis, 49.6% of the households in this study may be considered to be under the poverty line, with 37.2% poor and 12.4% hard core poor households.

The households in the padi villages were the worst off with 42.2% poor and 18.1% hard core poor, followed by those in the fishing villages, which had 38.7% poor and 9.8% hard core poor (Table 4). Rubber villages had the lowest proportions of poor (24.2%) and hard core poor (5.0%).

Occupation of heads of households

Although these villages were originally selected on the basis of having a particular dominant agricultural activity, nevertheless not all households were involved in the agricultural activity for which the village was selected. Table 5 shows the distribution of occupations among the heads of household. Overall, only 23.2% were involved in agriculture (8.9% as own account worker, 14.3% as waged labor). Although other household members might still be involved in agricultural activity, nevertheless, it was noted through observation and informal interviews during fieldwork that the majority were no longer doing agricultural work.

Table 4. Percentage distribution of households according to per capita income

	n	Monthly per capita household income (RM)				
		>0-54	>54-107	>107-150	>150-250	>250
Padi	249	18.1	42.2	16.1	13.6	10.0
Rubber	120	5.0	24.2	18.3	28.3	24.2
Fishing	204	9.8	38.7	20.1	21.6	9.8
All groups	573	12.4	37.2	18.0	19.5	12.9

Note: Poor households are defined as those with a monthly per capita household income of >RM54-107 while hard-core poor households as those with a monthly per capita household income of >RM 0-54.

Table 5. Occupations of heads of households

	Padi (n=243)		Rubber (n=119)		Fishing (n=203)		All groups (n=565)	
	No.	%	No.	%	No.	%	No.	%
Agricultural (own account worker):	26	10.7	14	11.8	10	4.9	50	8.9
Fisherman	0	0.0	0	0.0	9	4.4	9	1.6
Padi planters	6	2.5	0	0.0	0	0.0	6	1.1
Rubber smallholders	12	4.9	8	6.7	0	0.0	20	3.5
Others or unspecified[1]	8	3.3	6	5.1	1	0.5	15	2.7
Agricultural (waged worker):	46	18.9	5	4.2	30	14.8	81	14.3
Fishing	0	0.0	0	0.0	30	14.8	30	5.3
Rubber	36	14.8	4	3.4	0	0.0	40	7.1
Other[2]	10	4.1	1	0.8	0	0.0	11	1.9
Non-agricultural own account worker[3]	35	14.4	27	22.7	33	16.3	95	16.8
Non-agricultural manual workers	115	47.4	53	44.6	109	53.7	277	49.0
General or unspecified[4]	23	9.5	6	5.1	44	21.7	73	12.9
Factory workers	28	11.5	5	4.2	12	5.9	45	8.0
Service sectors	64	26.4	42	35.3	53	26.1	159	28.1
Non-manual workers[6]	10	4.1	12	10.0	14	6.9	36	6.4
Others[7]	11	4.5	8	6.7	7	3.4	26	4.6

[1] *Kerja kampung*, or 'village work'
[2] Other than fishing and rubber, such as oil palm, maize, etc. Only one was in the padi planting sector.
[3] Own business, contractors, hawkers, petty traders
[4] Includes general workers, informal labor, contract and construction laborers
[5] Drivers, guards, soldiers, firemen, policemen, postmen, wardens, helpers
[6] Clerks, technicians, supervisors, teachers
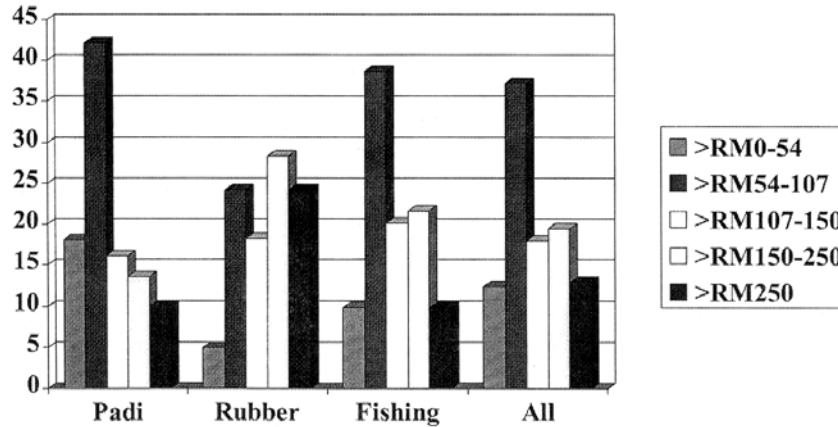[7] Pensioners, housewives, unemployed

Figure 1. Percentage distribution of households according to per capita monthly household income

Furthermore, an even lower percentage was involved in the agricultural activity for which the villages were selected in the first place. In rubber villages, for example, only 10.1% of heads of households (6.7% as smallholders, 3.4% as waged labour) were in the rubber sector, giving rise to an anomaly where more rubber smallholders and waged tappers were found in the padi villages (4.9% smallholders, 14.8% waged tappers) than in the rubber villages. In fishing villages, 19.2% were in fishing (4.4% as own account workers, 14.8% as waged workers), while in padi villages, only 2.5% of heads of households were padi planters.

Overall, in the fishing sector, there were more waged laborers (5.3%) than own account workers (1.6%), and likewise in the rubber sector, waged labourers made up 7.1%, and own account workers only 3.5%. There were very few household heads who were padi planters (1.1%). Among those who identified themselves as agricultural waged laborers in sectors other than rubber or fishing (1.9%), only one was in the padi planting sector.

In all three types of villages, the most dominant type of occupation was non-agricultural manual work (47.4% in padi villages, 44.6% in rubber villages, 53.7% in fishing villages). Among these, the highest proportions were in the service sector, as drivers, guards, wardens, general helpers, and uniformed personnel such as postmen and policemen (26.4% in padi villages, 35.3% in rubber villages, 26.1% in fishing villages). Non-agricultural own account workers, ranging from petty traders to small business persons, accounted for a significant proportion (14.4% in padi villages, 22.7% in rubber villages, 16.3% in fishing villages), while only a small proportion were non manual service workers such as clerks, technicians, teachers and supervisors (6.4% overall).

In rubber villages, where incomes were generally higher than padi villages, it may be observed that there were higher proportions of household heads who were non-agricultural own account workers (22.7% compared to 14.4% in padi villages) and non-manual service workers (10.0% compared to 4.1% in padi villages), and lower proportions of agricultural laborers (4.2% compared to 18.9% in padi villages).

Livestock rearing

Livestock rearing was fairly widespread as 57.8% of all households reared either one form of livestock or another (Table 6). A higher proportion of households in rubber villages (65.8%) were involved with livestock rearing compared to padi (57.0%) and fishing villages (53.9%). Chickens and ducks were the type of livestock most widely reared, particularly in rubber areas (61.7%). Cows and buffaloes were most widely reared in padi villages (15.3%) compared to the other areas. This is to be expected as the buffalo is traditionally used to plough padi fields, although this practice has largely given way to ploughing by motorised tractors. Goats were also relatively more abundant in padi villages (10.0%) compared to rubber (1.7%) or fishing villages (3.4%).

Vehicle ownership

Most households (88.4% in padi villages, 94.2% in rubber villages, and 90.7% in fishing villages) owned at least one motorised vehicle (Table 7). The predominant vehicle owned was the motorcycle. This could be seen from the high proportion owning either a car, van or motorcycle (89.9%) compared to the low proportions owning either a car or a van (24.8%), a lorry or tractor (1.9%), or a motorboat (1.2%). Nevertheless, there were still households (3.1%) that did not have access to motorised transport, and depended on bicycles and public transport.

Household items

Data on household items were also used as an indicator of socio-economic status (Table 8). The majority of households (73.6%) owned a refrigerator, and a considerable proportion owned a washing machine (58.8%), or even both a refrigerator and a washing machine (52.7%). Only 20.2% did not own at least one of these two items. Ownership of these two household items were high in the rubber and the fishing villages, and was the lowest in the padi villages; but even so, in padi villages, 65.5% had a refrigerator, 46.6% had a washing machine, and only 30.9% had neither item.

Table 6. Percentage of households which rear livestock

	n	Households rearing livestock[1]	Type of livestock reared				
			Cow / buffalo	Goat	Chicken / duck	Others[2]	Fish
Padi	249	57.0	15.3	10.0	45.4	2.0	0.0
Rubber	120	65.8	3.3	1.7	61.7	1.7	0.8
Fishing	204	53.9	5.9	3.4	52.5	1.5	0.0
All groups	573	57.8	9.4	5.9	51.3	1.7	0.2

[1] Households which rear any livestock at all
[2] Primarily rabbit

Table 7. Ownership of vehicles

	n	Percentage of households which own						
		Car/van	Car/ van/ motorcycle	Car/ van/ motorcycle/ bicycle	Lorry/ tractor	Motorboat	Any motorised vehicle[1]	None[2]
Padi	249	21.7	88.4	95.6	1.2	0.0	88.4	4.4
Rubber	120	33.3	94.2	100.0	0.8	0.0	94.2	0.0
Fishing	204	23.5	89.2	96.1	3.4	3.4	90.7	3.4
All groups	573	24.8	89.9	96.7	1.9	1.2	90.4	3.1

[1] Households which own at least one motorised vehicle
[2] Households which do not own any vehicle, not even a bicycle

Table 8. Ownership of household amenities

	Percentage of households			
	Padi (n=249)	Rubber (n=120)	Fishing (n=204)	All groups (n=573)
Household appliances:				
Refrigerator	65.5	86.7	76.0	73.6
Washing machine	46.6	61.7	72.1	58.8
Both[1]	43.0	58.3	61.3	52.7
Neither[2]	30.9	10.0	13.2	20.2
Entertainment:				
TV or radio	97.2	98.3	97.5	97.6
TV	88.0	94.2	93.1	91.1
Video recorder	21.7	34.2	17.6	22.9
Communications:				
Telephone	19.3	68.3	54.9	42.2
Mobile phone	2.4	10.8	7.8	6.1
At least one[3]	20.9	69.2	55.4	43.3
Computer	0.8	5.8	2.0	2.3

[1] Households which own both a refrigerator and a washing machine
[2] Households which own neither a refrigerator nor a washing machine
[3] Households which own at least a telephone or a mobile phone

Table 9. Water supply

	Percentage distribution of households			
	Padi (n=249)	Rubber (n=120)	Fishing (n=204)	All groups (n=5 73)
Piped water in the house	43.4	70.0	59.3	54.6
Public standpipe	5.6	0.8	0.5	2.8
Well water	28.9	2.5	38.7	26.9
River/ canal/ pond	0.0	2.5	0.0	0.5
Others	22.1	24.2	1.5	15.2

Most of the households (97.6%) had either a television or a radio, and in fact most households had televisions (91.1%), although the video recorder was less widely owned (22.9%). The

telephone seems to be a more sensitive indicator of socio-economic status, being much more widespread in the richer rubber areas (68.3%) and much less so in the poorer padi areas (19.3%).

The mobile phone is less widely owned (10.8% in rubber villages, 2.4% in padi villages), and the computer has even less of a presence in these rural households, with 2.3% overall owning one.

Public amenities

On the whole, more than half (57.4%) the households had access to piped me supplied by the public authorities. Most of these (54.6%) had the water piped into their houses, while only a small proportion (2.8%) had to access water from public standpipes. Nevertheless, a Loge proportion depended on well water (26.9%), primarily in the fishing (38.7%) and padi villages (28.9%). Furthermore, 15.2% listing 'other' as water source (24.2% in the rubber areas and 22.1% in the padi areas), depended on water piped from the hills.

Electricity was available in almost all households in the survey (99.7%) (Table 10). Electricity and gas were the primary fuels used for cooking with very few households, notably in the padi areas, using wood and kerosene. The majority of households had pour-flush toilets (86.4%), whereby the sewage was usually flushed into open drains, canals, or rivers. Only a small proportion (8.7%) of households had flush toilets that were connected to sewage tanks. The predominant method for rubbish disposal was by burning (79.2%), with a small proportion of households (14.5%), primarily in the fishing (27.9%) and the rubber villages (10.9%) that were sufficiently close to urban centers, having access to rubbish collection services.

Table 10. Electricity, fuel, toilet and rubbish disposal

	Percentage of households			
	Padi (n=249)	Rubber (n=120)	Fishing (n=204)	All groups (n=573)
With electricity supply	99.6	100.0	99.5	99.7
Fuel for cooking:				
Electricity/ Gas	94.0	96.7	99.5	96.5
Wood	4.4	1.7	0.0	2.3
Kerosene	1.6	0.8	0.5	1.0
Other types	0.0	0.8	0.0	0.2
Type of toilet:				
Flush	6.0	11.7	10.3	8.7
Pour-flush	90.0	80.8	85.3	86.4
River	0.8	7.5	0.0	1.9
Other	3.2	0.0	4.4	3.0
Rubbish disposal:				
Collected	5.2	10.9	27.9	14.5
Burn	92.4	68.9	69.1	79.2
Bury	1.2	10.9	2.5	3.7
Throw (river)	0.4	7.6	0.0	1.7
Throw (anywhere)	0.8	1.7	0.5	0.9

DISCUSSION

The data presented in this paper was collected in April-May 1998. The Asian financial crisis had affected the country toward the later part of 1997. In 1998, the country as a whole was facing negative income growth. The incidence of poverty among Malaysian citizens increased from 6.1% in 1997 to 8.5% in 1998 (Malaysia, 2001). Although the urban centers were the first to be affected, the rural areas would also have felt the effects by early 1998.

Generally, incomes are lower and poverty more prevalent in rural areas compared to urban areas. The incidence of rural poverty among Malaysians was 10.9% in 1997 and 12.4% in 1999 (Malaysia, 2001), when it was the highest among the agriculture workers at 16.4%. The levels of poverty in the villages of the current study are much higher (ranging from 20.9% in rubber villages to 60.3% in padi villages) compared to the national figures.

The median monthly household income in this study (RM650), however, is almost the same as the mean monthly gross household income of the bottom 40% of all rural households (RM670) (Malaysia, 2001), indicating that more than half of the households in the Family Dynamics Study may be considered to be from this category. The households in the padi villages have a mean household income (RM748) that is higher than this bottom 40% average (RM670), but their median household income (RM550) is much lower.

Household incomes were substantially higher in rubber areas, as reflected by a higher mean (RM1211) and median (RM995) than the national average for the bottom 40% rural households (RM670). Higher proportions of the heads of households in rubber areas were also not involved in agricultural occupations. This is confirmed by observations made during fieldwork, that is, many households have moved out of agriculture, particularly in the rubber areas. There is wide income disparity, as indicated by the wide spreads in incomes within each area but particularly in the rubber areas.

Comparing the Family Dynamics Study (FDS) with the Functional Groups Study (FGS) (Table 11), mean monthly household income in the rubber and padi villages was significantly higher in the Family Dynamics Study than in the Functional Groups Study (padi, t = 5.4, p < 0.001; rubber, t = 9.8, p < 0.001). Although per capita household incomes were also generally higher in the later Family Dynamics Study, these differences, however, were significant for the rubber villages only (t = 7.6, p < 0.001).

Table 12 and Figure 2 compare poverty levels between the 1997 Family Dynamics Study and the 1992 Functional Groups Study. (Refer to Chee *et al.* (1997) for calculation of poverty incidence in the FGS.) Overall, the proportion of poverty households was lower in the 1997 study (49.6%) compared to the 1992 study (55.2%). However, this was due mainly to the rubber villages, where poverty levels was very much lower in the more recent study (29.2% compared to 54.5%). In the padi and fishing villages, the pattern was reversed as poverty levels were slightly higher in the 1997 study (60.3% compared to 58.8% for padi; 48.5% compared to 47.7% for fishing).

Table 11. Comparison of means for household size and income between the Family Dynamics Study (FDS) and the Functional Groups Study (FGS)

	Study	n	Means (±SD)	t	P
Padi villages					
No. of household members	FGS	681	5.3±2.6	7.6	0.000***
	FDS	249	6.5±2.2		
Household income (RM) (per month)	FGS	678	520±560	5.4	0.000***
	FDS	249	748±577		
Household income per capita (RM)	FGS	678	109±118	1.5	0.123
	FDS	249	122±93		
Rubber villages					
No. of household members	FGS	156	4.5±2.7	6.6	0.000***
	FDS	120	6.4±2.1		
Household income (RM) (per month)	FGS	154	377±272	9.8	0.000***
	FDS	120	1211±902		
Household income per capita (RM)	FGS	154	95±64	7.6	0.000***
	FDS	120	198±139		
Fishing villages					
No. of household members	FGS	322	6.7±3.1	2.5	0.014*
	FDS	204	6.1±1.9		
Household income (RM) (per month)	FGS	321	750±778	0.5	0.644
	FDS	204	775±469		
Household income per capita (RM)	FGS	321	128±151	0.7	0.474
	FDS	204	137±85		
All villages	FGS	1159	5.6±2.8	6.7	0.000***
No. of household members	FDS	573	6.4±2.1		
	FGS	1153	565±615	8.9	0.000***
Household income (RM) (per month)	FDS	573	854±652		
	FGS	1153	113±123	5.1	0.000***
Household income per capita (RM)	FDS	573	143±106		

*   p<0.05
***   p<0.001

In padi and fishing areas, although incomes in the 1997 study were higher than the 1992 study, the incidence of poverty was also higher. This reflects a wider income disparity in 1997; although there might have been households with increased incomes, more households were also poorer. In the rubber villages, income and poverty levels showed a dramatic improvement in the 1997 study compared to the 1992 study. Considering that four out of six rubber villages are similar for both these studies (Table 1), it would be reasonable to conclude that the economic status of rubber households has generally improved. The fishing and padi villages, on the other hand, are not so directly comparable, as only five out of twelve padi villages are the same for both studies, while none of the fishing villages are similar. Even so, if we assume that these villages do reflect the general pattern in the districts, it would appear that the padi and fishing villages have on the whole remained poor.

Table 12. Percentage distribution of hard-core poor, poor and non-poor households in the Functional Groups Study (1992-1996) and the Family Dynamics Study (1997-2001).

	% distribution of households	
	FGS (1992-1996)	FDS (1997-2001)
Padi		
Hard-core poor	23.3	18.1
Poor	35.5	42.2
Non-poor	41.2	39.7
Rubber		
Hard-core poor	19.5	5.0
Poor	35.0	24.2
Non-poor	45.5	70.8
Fishing villages		
Hard-core poor	12.2	9.8
Poor	35.5	38.7
Non-poor	52.3	51.5
All villages		
Hard-core poor	19.7	12.4
Poor	35.5	37.2
Non-poor	44.8	50.4

Note: In the FDS (1997-2001), poor households were defined as households with per capita monthly incomes equal or less than RM107, and hard-core poor households were households with per capita monthly incomes equal or less than RM54. In the FGS (1992-1996), poor households were defined as households with per capita monthly incomes equal or less than RM84, and hard-core poor households were households with per capita monthly incomes equal or less than RM42.
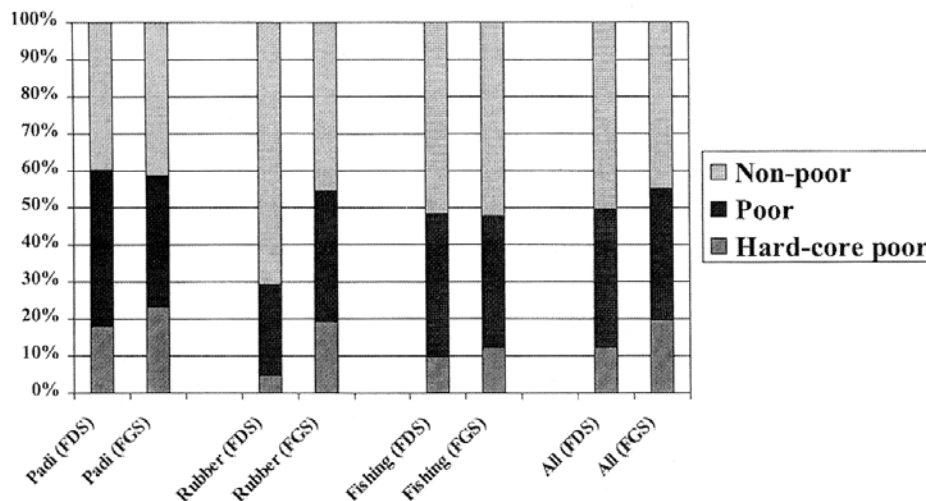

Figure 2. Distribution of hard-core poor, poor and non-poor households, FDS (1997-2001) & FGS (1992-1996)

Nevertheless, it should be noted that the economic situation of the villages cannot be directly linked to their being involved in the agricultural crop for which they were selected. This is because there has been a general shift in occupations out of the agricultural sector. Indeed, the most striking finding to emerge from the Family Dynamics Study is the low proportion of heads

of households who were involved in agricultural activities, whether as own account workers, or as waged labourers. Padi planting as a whole has all but disappeared from these villages.[2] In general, the feedback obtained from informal interviews with villagers and local government officials indicates that this is due to 'the land drying up', 'inadequate supply of irrigation water', and simply that padi planting is no longer a profitable venture. With the price of rice subsidised by the government, the villagers may not even find it worthwhile to grow padi for their own consumption.

In all the villages studied, waged labour was the predominant occupational status of heads of households, and the majority were non-agricultural manual labour inclusive of service workers, factory workers, and general workers. The predominance of waged labourers over own account workers, particularly in the rubber and fishing areas, reflects a changing employment structure within the agricultural sector as well as the increasing availability of industrial and other non-agricultural jobs in the rural areas, and the diminishing importance of the agricultural sector in this country.

This can be seen by comparing the present study to the 1992 Functional Groups Study (Table 13). Overall, more than half of the households studied in 1992 had work related to agriculture (55.3%), but this proportion was reduced by more than half (24.3%) in the 1997 study. More heads of households were agricultural own account workers in the 1992 study (34.1%) than in the 1997 study (9.3%), and likewise agricultural waged workers (21.2% in the 1992 study, 17.6% in the 1997 study). On the other hand, non-agricultural manual workers constituted only 23.3% in the earlier study, but were 51.4% in the later study.

Table 13. Occupational distribution of heads of household in the Family Dynamics Study (1997-2001) and Functional Groups Study (1992-1996)

	FGS (1992-1996)		FDS (1997-2001)	
	No.	%	No.	%
Agricultural own account worker	313	34.1	50	9.3
Agricultural waged worker	195	21.3	81	15.0
Agricultural (total)	**508**	**55.4**	**31**	**24.3**
Non-agricultural own account worker	137	14.9	95	17.6
Non-agricultural manual worker	214	23.3	277	51.4
Non-manual workers	59	6.4	36	6.7
Non-agricultural (total)	**410**	**44.6**	**408**	**75.7**
Total (Agricultural & Non-agricultural)	918	100.0	539	100.0

$x^2 = 171.9$, df=4, p=0.000

Compared to the rubber villages, padi and fishing villages have more agricultural waged labour and less own account workers; while outside the agricultural sector, these villages also have higher proportions of manual waged labour (in the general and factory sectors, though not in services) and lower proportions of own account workers. There are also higher proportions of

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[2] None of these villages are in the double cropping belts that are served by the large irrigation schemes of Muda or Kemubu

non-manual workers in the rubber villages. The better economic situation of the rubber villages therefore appears to be linked to these differences in occupational profiles. Nevertheless, there is also a locational difference, as the rubber villages are located in the economically better off west coast of Peninsular Malaysia, while the padi and fishing villages are in the economically poorer east coast and the north.

Overall, there were significant differences in the other socio-economic indicators between the 1992 and 1997 studies that were concomitant with the differences in income and occupations (Table 14). Livestock rearing was not markedly different for the two studies, except in rubber villages where it was significantly less widespread in the Family Dynamics Study compared to the earlier study ($x^2 = 7.9$, p<0.01). It would appear that as incomes increase, the need to rear livestock decreases.

The motorcycle was still the most dominant mode of transport, being much more affordable than cars or vans. Both vehicle ownership and motorised vehicle ownership were significantly higher in the more recent Family Dynamics Study in all the villages (Table 14). The same pattern is observed for refrigerator and washing machine ownership, which was consistently and significantly higher in the more recent, compared to the earlier study. The higher proportions of households having these household items in the 1997 study reflect the generally higher incomes of households in this study. It also reflects the rising affluence of Malaysian rural society where refrigerators, washing machines, motorised vehicles and televisions are increasingly considered as household necessities. The telephone and the personal computer, on the other hand, were not as widely owned, and this may indicate their relative lack of priority in a rural Malaysian household.

Although electricity is universally available, access to safe water supply and proper sewerage is less satisfactory. In the Family Dynamics Study, a large proportion of households still depended on unsafe and unreliable sources of water, although in the rubber villages, piped water supply and flush toilet facilities were significantly more widespread in the more recent than the earlier study (Table 14). In the fishing villages, on the other hand, there were significantly lower proportions of households with piped water supply in the more recent study.

Unlike household items and vehicles, water supply and sewerage are more dependent upon investment by the state. Although increased household incomes could be used to purchase household items, the personal choices for water supply and sewerage are limited by environment and infrastructure. The unsatisfactory sewerage and rubbish disposal systems are therefore cause for concern as these should be the first priority in any governmental development plan.

Table 14. Comparison of percentage distribution of households with selected variables between the Family Dynamics Study (FDS) and the Functional Groups Study (FGS)

	% distribution of households		X²	p
	FGS (1992-1996)	FDS (1997-2001)		
Padi villages				
Total no. of households (n)	681	249	-	-
Livestock	530	57.0	1.0	0.310
Vehicles	78.3	95.6	1.0	0.000***
Motorised vehicles	57.1	88.4	77.3	0.000***
Washing machine and / or refrigerator	39.9	69.1	60.9	0.000***
Piped water supply	50.5	43.4	3.4	0.064
Flush toilet facility	92.5	96.0	3.0	0.081
Rubber villages				
Total no. of households (n)	156	120	-	-
Livestock	81.4	65.8	7.9	0.005**
Vehicles	87.2	100.0	14.7	0.000***
Motorised vehicles	78.2	94.2	12.4	0.000***
Washing machine and / or refrigerator	43.6	90.0	61.2	0.000***
Piped water supply	39.1	70.0	24.7	0.000***
Flush toilet facility	79.5	92.5	8.1	0.004**
Fishing villages				
Total no. of households (n)	322	20.4	-	-
Livestock	52.5	53.9	0.1	0.816
Vehicles	79.5	96.6	29.0	0.000***
Motorised vehicles	62.4	90.7	49.6	0.000***
Washing machine and /or refrigerator	67.7	86.8	23.3	0.000***
Piped water supply	98.4	59.3	134.5	0.000***
Flush toilet facility	89.4	95.6	5.5	0.019*
All villages				
Total no. of households (n)	1159	573	-	-
Livestock	56.7	57.8	0.1	0.707
Vehicles	79.8	96.9	88.3	0.000***
Motorised vehicles	61.4	90.4	154.9	0.000***
Washing machine and / or refrigerator	48.1	79.8	156.6	0.000***
Piped water supply	62.3	54.6	9.1	0.003**
Flush toilet facility	89.9	95.1	12.9	0.000***

* $P<0.05$
** $P<0.01$
*** $P<0.001$

CONCLUSION

The socio-economic profile of the rural villages in the Family Dynamic Study presented a general picture of persistent poverty and low incomes. The villages selected to represent padi cultivation areas had the most depressed indicators, while those selected to represent rubber cultivation areas had relatively better indicators. Although incomes were generally higher when

compared to the earlier Functional Groups Study (1992), poverty levels were also slightly higher in padi and fishing villages; only the rubber villages showed marked improvement in both income and poverty levels.

Nevertheless, it should be noted that agricultural activity for which the villages were selected to represent was in many cases no longer the dominant activity. Occupations of heads of households were predominantly non-agricultural, and there were more waged workers than own account workers. A comparison between the 1992 and 1997 studies showed a marked decrease in agricultural occupations, primarily of agricultural own account workers, and a concomitant increase in non-agricultural occupations, particularly waged workers.

Generally, access to household items vehicles, and livestock was widespread, and better in the 1997 study compared to the 1992 study. Nevertheless, piped water supply was inadequate, and in the padi and fishing areas, the households in the 1997 study were worse off than those the 1992 study. Considering the importance of a safe water supply for the general well-being of a population, and particularly for the health and nutrition of children, this situation is in need of urgent attention.

ACKNOWLEDGEMENTS

REFERENCES

Chee HL, Khor GL and Tee ES (1997). Nutritional assessment of rural villages and estates in Peninsular Malaysia: I Socio-economic profile of households. *Malaysian J of Nutr* 3(1) : 1-19.

Institute for Medical Research (IMR), Universiti Putra Malaysia (UPM) and Ministry of Health (MOH) (1993). A study of the nutritional status of the major functional groups in Malaysia. *Proc Nutr Soc Mal* 8 : 108-111

Malaysia (2001). Eighth Malaysia Plan 2001-2005. Kuala Lumpur: Government Printers.

Norhayati M, Noorhayati MI, Mohammod CG *et al.* (1997). Malnutrition and its risk factors among children 1-7 years old in rural Malaysian communities. *Asia Pacific J Clin Nutr* 6(4): 260-264.

Wan Abdul Manan Wan Muda (1998). Personal communication.

Wei Luo, Zhai FY, Jin SG & Ge KY (2001). Intrahousehold food distribution: A case study of eight provinces in China. *Asia Pacific J Clin Nutr* 10 (Suppl): S19-S28.

Zalilah Mohd Shariff, Bond JT & Johnson NE (2000). Nutrition and educational achievement of urban primary schoolchildren in Malaysia. *Asia Pacific J Clin Nutr* 9(4): 264-273.

Zamaliah Mohd Marjan, Mohd Nasir MT, Khor GL & Tee ES (1998). Socio-economic determinants of nutritional status of children in rural Peninsular Malaysia. *Asia Pacific J Clin Nutr* 7(3/4) 307-310.