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Expenditure Analysis of the Farm Household Economy in Malay Paddy Growing Villages

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Abstract: Malaysia has experienced tremendous economic transformation from agriculture based to a manufacturing based. Such development has spillover effect on the livelihood of rural household by engaging in the off-farm income activities. However, there have been income inequalities between both Coasts because most of the industrial parks are located in the West Coast. This study aims to examine patterns and determinants of household expenditure in four paddy farming areas. The results indicate that on average the household expenditure in east coast is lower compare to the West Coast. The expenditure function indicates that off-farm income and number of family members are the major determinants.

Key words: farm household, expenditure-pattern, off-farm income, Engle's coefficient, paddy area, expenditure function

INTRODUCTION

Malaysia has achieved the most dramatic economic growth since the late1980s. This is largely due to the investments by foreign multi-national companies in the manufacturing sector. However the role and contribution of agriculture to the Gross Domestic Product (GDP) has over past 2 decade has declined significantly. The share of the manufacturing sector to the GDP changed from 12.2% in 1970 to 26.1% in 2010 while the share of the agricultural sector declined from 32.1% to 7.2% respectively

Economic development has usually diversified livelihood with respect to income sources and occupation in a country (Frank 2000). In the case of Malaysia, industrialization through the manufacturing sector brought job opportunities in industrial zones and cash earnings as a salary which meant many Malaysians' livelihoods became rapidly diversified. Main income opportunities have shifted from the on-farm sector to the off-farm sector among farmers especially in areas where industrial zones has been established and gazette. Off-farm income has become important as alternative income instead of on-farm income (Ooi 2004).

The manufacturing sector has created income earning opportunities for Malaysian people, and income level among households has improved. Overall Malaysian, household income has improved e.g. in the bottom 40% of household income group from RM377 in 1980 to RM1,222 in 2008, in the middle of 40% of household income group from RM1,016 to RM2,957, and in the top of 20% from RM3,354 to RM8,157 (NEAC 2009). Normally along with the income growth the living standard has also been improved in the areas of working life, transport and communication, health, education, housing, family life, social participation and culture and leisure (Malaysian Quality of Life 2004). Transformation in the Malaysian economy has occurred changes on the overall level of household income, and consequently it improved living standard and well-being. It has changed people's life-style in Malaysia.

However, geographical advantage for industrialization and convenient infrastructure concentrated on the West Coast of the Peninsula Malaysia therefore has separated the both costal sides into more developed in the West and less developed areas in the East Coast areas. Since the East coast areas have been left behind from the industrial development, seeking jobs in off-farm sector is not readily available on the East Coast. Even though it is said that income level and living standard in Malaysia have improved drastically over three decades, there are economic gaps among farms households based on the regional disparities between the both coastal areas. Household income surveys suggested that income growth has been strong only for the top 20% of Malaysian income earners. The bottom 40% of households have experienced the slowest growth of average income, earning less than RM1,500 per month in 2008 (NEAC 2009).

About14.5% of the total number of labour force in Malaysia is in agricultural sector (Agriculture Statistical Handbook 2008). The majority of the Malaysian farmers are smallholders who work on small uneconomic plots (Acharya 2002), and smallholders are mostly Malays. Especially on the East Coast, paddy peasants always have struggled and dealt with livelihood hardships. In developing economies, non-farm income is very important to food security and risk management in rural sector. The emergence of manufacturing sector in the rural area and

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the opportunity to earn off-farm income has been the saviors of lower household income group among paddy farmers. However, the farmer's residential areas whether living in commuting distance from industrial parks or not have mattered to farmer's job opportunities and income levels between the East and West Coast in this has caused income inequalities among farmers.

In order to bridge the regional economic inequalities in Malaysia, it is important to clarify the actual situation of people's livelihood. For comprehending how the development of Malaysian economy has differently influenced on people's life, this study compares peasant livelihood among rice granaries locating between more and less industrialized areas. This study focuses on paddy farmers holding a small scale of land between urban and rural side of rice granaries. Focusing especially on their household expenditure in the livelihood would lead revealing peasant farmer's living standard which can be directly reflected by household expenditure. A survey was conducted in the four areas from late 2010 to middle 2011 using a structured questionnaire. The specific objectives of this paper are as follows: (1) to determine the pattern of household expenditure in main paddy granaries, (2) to estimate the Engel's Coefficient for farm household expenditure, and (3) to examine the determinant factors influencing Engel's Coefficient in household expenditure among the main granaries located in both East and West coastal areas of Peninsular Malaysia.

The following methods were used in this study. First, monthly average expenditure by items at household level were shown in each four areas and costal sides. Second, we focused on food expenditure by computing Engel's Coefficient among farm households. Thirdly, we determine the influential factors on Engel's Coefficient. This enabled the researcher to understand the reality of the farm household expenditure and of the specific factors which brought differences in household expenditure by using linear regression analysis.

Household Condumption Expenditure: Engel's Law:

The household economy is one of the most important perspectives which directly draw the condition of peoples' lives. Especially household expenditure is an important approach to illustrate living standard based on people's consumption pattern. There are numerous studies in the field of household expenditure studies for capturing people's life style in their dietary life, healthcare, clothing, food, housing and others (Arief 1980, Hazell 1983, Lee 2006 and Lim et.al. 2010).

Baudet and Meulen (1982) traced changes in the Japanese lifestyle influenced by household expenditure, especially in relation to food consumption. They pointed out two factors which have led to changes in Japanese food consumption habits: the introduction of western food culture where there is more meat consumption in the Japanese diet and the outcome of economic development through industrialization. Perali (2003) indicated that the percentage of food expenses as an indicator of economic well-being is based on Engel's observation of the living standards of a household. This varies with family size and is negatively related to the share of food expenses in the household budget. Kirkpatrick (1971), who reviewed Engel's law of consumption, explains how the standard of living, consumption and living conditions are strongly related.

In Malaysia, there has been a significant change of people's dietary life with an increased in per person consumption of wheat, from 33 kg in 1990 to 58 kg in 2005. In contrast, rice consumption per person declined by around 15 per cent over the same period. Despite this development, rice remains the major staple and provides close to one-third of daily calorie intake on average (Warr et al. 2008). The Malaysian Household Expenditure Survey (1998/99) to examine expenditure patterns at household level on food-away-from-home (FAFH) (Heng 2007) and found that the Chinese population, the urban residents, or those with higher monthly household income have significantly higher FAFH expenditures than their non-Chinese, rural, or lower household income cohorts, ceteris paribus.

In addition to the change of people's eating habit in urban areas the household size, races, age of household head, income, and gender are the main variables related to household food expenditure pattern. The share of food expenditure will increase with an increase in income among the Malaysian population. The estimated results are clearly a reflection of "Engel's law", resulting in bigger expenditure elasticity for lower income groups than higher income groups. Lower income households in Malaysia tend to spend bigger portion amount of their incremental income on foods (Yeong-Sheng, 2008).

Table 1 shows average monthly expenditure per household in Malaysia from 1993 to 2010 based on twelve items of expenses. In actual count, overall monthly expenses per household have gradually increased from RM1,161 in 1993/94 to RM2,190 in 2009/10. There were increasing tendencies during almost two decades especially in food and non-alcoholic beverages, housing, water, electricity, gas and other fuels, transportation, communication and so on.

Table 1: Average monthly expenditure per household, Malaysia, 1993/94–2009/10.

Expenditure group	1993/94	1998/99	2004/2005	2009/2010
Food and non-alcoholic beverages	276	368	393	444
Alcoholic beverages and tobacco	26	30	35	48
Clothing and footwear	41	56	59	75
Housing, water, electricity, gas and other fuels	245	363	430	495
Furnishings, household equipment and routine household maintenance	65	84	83	89
Health	21	29	27	29
Transport	168	227	314	327
Communication	24	59	103	124
Recreation services and culture	53	70	92	101
Education	17	31	38	31
Restaurants and hotels	145	209	213	239
Miscellaneous goods and services	78	105	167	190
Overall expense	1,161	1,631	1,953	2,190

Source: Department of Statistics, 2011.

As shown in Table 2, there was changing patterns of consumption expenditure based on the data of household consumption during the period of 2000-2009. Expenditure on food and non-alcoholic beverages constituted of the largest component, accounting for about 23% of total household expenditure. This was followed by expenditures on housing and utilities, transport, restaurants and hotels, and miscellaneous goods and services. These five largest components of consumption expenditure accounted for 75.6% of total household spending. (Economic Development 2010).

Table 2: Household Consumption by Purpose from 2000-2009.

	2000	2009	2000-2009
	% of total household consumption		
Food and non-alcoholic beverages	24.1	21.8	23.0
Alcoholic, beverages and tobacco	2.2	2.3	2.1
Clothing and footwear	3.5	2.4	2.7
Housing, water, electricity, gas and fuels	21.7	16.7	18.9
Furnishings, household equipment and maintenance	5.9	5.2	5.4
Health	2.1	2.1	2.0
Transport	12.6	13.1	13.4
Communication	4.9	7.4	6.3
Recreation and culture	4.3	4.9	4.5
Education	1.5	1.6	1.5
Restaurants and hotels	5.8	9.7	7.5
Miscellaneous goods and services	11.6	12.7	12.8

Source: Department of Statistics Malaysia 2010

Methodology:

The survey was conducted in late 2010 in paddy granaries in Peninsular Malaysia. As shown in Figure 1, these areas are: 1) the Muda Agricultural Development Authority (MADA); 2) Penang Integrated Agriculture Development Area (IADA Penang); 3) Kemubu Agricultural Development Authority (KADA): and 4) North Terengganu Integrated Agriculture Development (KETARA). Random sampling was used to select paddy farming household heads under the same farming and irrigation systems. In total, 161 farmers were selected as respondents to answer the questionnaire.

The surveys were conducted in Kota Sarang Semut, Simpang Empat, Yan for 40 farmers in MADA area, and Kg. Permatang Tinggi Bakar Bata for 42 farmers in IADA Pulau Pinang Sebrang Prai. Thirty eight (38) respondents were interviewed in Kg. Hutan Chengal in KADA, and 41 paddy farmers in IADA, Ketara. Based on the context of industrialization in Malaysia, the former two areas on the West coast are located in commuting distance from industrial zones. The latter two areas on the East Coast are located in distanced from the center of cities in rural area on the East Coast.

Fig. 1: Location of study areas in the peninsula.

Table 3 shows the characteristics of paddy farmers and households. Though farm size in IADA Pinang was smaller than other areas, the number of owner farmers was more than other areas. More than half number of household heads has secondary job together with rice faming activities. Additionally, the main pattern of tenant status in KADA was landlord which covered by Ladang Merdeka Manan. This is why only three household heads belonged to full-time farming activities and the rest of household heads did not belong either full-time and part time farmers. The rest of households, 34 of household heads, were landlords who rented out their land to Ladang Merdeka Manan project by KADA. Average on-farm and off-farm incomes were also shown in Table 3. In four areas, off-farm income largely contributed total household income. Except the income situation in MADA, off-farm income in three of areas was main income sources which contributed more than half amount in total household income.

Table 3: Demographic of four areas studied.

Items	MADA	IADA Pulau Pinang	KADA	IADA KETARA
Number of households studied	40	42	38	41
Average family size (persons)	4.8	5.6	5.0	5.5
Job of head of household				
Full-time (paddy only)	13	17	3	12
Part-time	27	25	0	29
Characteristics of household				
Full-time farm household	10	3	-	5
Part-time farm household	30	39	3	36
No.of farmers by tenurial status				
Landlord	0	0	33	0
Landlord-owner farmer	0	0	1	0
Owner farmers	4	21	0	9
Owner-tenant farmers	17	16	1	13
Tenant farmers	19	5	3	19
Average farm size (acre)	8.15	3.00	0.83	6.89
Average on-farm income (RM/month)	1,745	965	116	1,019
Average off-farm income (RM/month)	1,203	3,827	1,852	1,951
Average household income (RM/month)	2,948	4,792	1,968	2,970

Source: Own survey 2010 and 2011

Note: farm land size does not include the land of landlord in Penang state.

:In KADA, most of household heads were only landlord except three farmers, because KADA rent their land for the Ladang Merdeka Project.

RESULTS AND DISCUSSION

Household Expenditure:

Table 4 shows average household expenditure by items between the both coastal areas. Total average expenditures were RM1,248.1 in Kelantan, RM1,854.4 in Terengganu, RM1,988.9 in Kedah and RM1,306.8 in Penang. Among four areas, item of food had large occupancy in monthly household expenditure followed by education, bill payment, fuel, loan and so on.

Table 5 shows statistical test of differences of average expense in each item between West and East Coast area. It is clear that food expense, medical care, and bill payment including electricity and water had significant difference between two areas. Especially, food expense had the largest difference at 1% significant level such as RM522.0 in the East Coast areas and RM705.1 in the West Coast areas on the average, constituted 33.6% and 43.3% of household expenditures in each area.

Table 4: Average household expenditure by items among four areas.

	East coast				West coast			
	Kelantan		Terengganu		Kedah		Penang	
	Average	%	Average	%	Average	%	Average	%
Food	456.7	36.6	582.4	31.7	813.8	41.2	601.6	46.2
Cloth	53.6	4.3	90.2	4.9	87.8	4.5	64.1	4.9
Hospital	23.6	1.9	15.5	0.8	22.1	1.1	41.3	3.2
Education	116.0	9.3	301.4	16.4	185.3	9.4	145.7	11.2
Bill payment*	188.6	15.1	336.9	18.3	153.2	7.8	115.8	8.9
Recreation	74.7	6.0	53.0	2.9	81.2	4.1	48.4	3.7
Loan	171.1	13.7	187.2	10.2	331.6	16.8	99.5	7.6
Fuel*	163.9	13.1	269.6	14.7	298.3	15.1	185.2	14.2
Total	1,248.1	100.0	1,836.4	100.0	1,973.2	100.0	1,301.7	100.0

Source: Field Survey 2010 and 2011

Note: Bill payment included water and electricity.

One of the most important empirical regularities in consumption economics is the Engel's law (Selvanathan 2003 and Syrovatka 2003). As income increases, households' demand for goods, including food, increases (Cirera and Masset 2010). Engel's law generalizes Engellian relationship between income and the percentage allocated to food, stating that the higher the income, the lower the proportion of income allocated to food (Edirisinghe 1987). It means that the poor allocate a high proportion of their total spendable resources to foods and that as these resources increase, the proportion allocated to food decreases, and larger proportions are allocated to non-food goods.

Based on the four of study areas, Table 6 shows monthly food expenditure, whole average household expenditure and Engel's law coefficients. In the East Coast side, Engel's coefficients were 33.6% and 36.6% in Kelantan and 31.4% in Terengganu. In the West Coast it was 43.3% on average and 40.9% in Kedah and 46.3% in Penang. In comparison with the difference between both coastal areas, Engel's coefficient in the West Coast was comparatively higher than the East Coast of areas. Hypothetically, Engel's laws in the West coast areas could have been lower than the East Coast areas because income levels in the West Coast were higher than the East Coast areas. However, there occurred inverse phenomena in the Engel's laws between two coastal areas, assumedly because of the difference due to the situation of rural economy in Malaysia. Since there has been urbanization and industrialization in the West Coast areas, money economy accelerated people to do groceries shopping especially for food, while the East Coast areas where subsistence economy Still persist and majority of farm household have kept kitchen garden and small farm for sustaining a part of their self-consumption.

Table 5: Comparison of household expenditure by item between the coastal areas.

	East coast (N=79)		West coast (N=82)		T-value	
	Average	SD	Average	SD		
Food	522.0	312.9	705.1	324.1	-3.65	***
Cloth	72.6	95.1	75.7	57.9	-0.25	
Hospital	19.4	34.6	32.0	58.9	-1.66	
Education	212.2	165.0	165.0	179.0	0.84	
Bill payment	265.6	134.0	134.0	79.9	2.13	**
Recreation	63.5	117.8	64.4	194.9	-0.04	
Loan	179.5	819.1	212.8	342.3	-0.34	
Fuel	218.8	171.3	240.4	213.0	-0.71	
Total	1,553.4	1,258.1	1,629.2	821.4	-0.45	

Source: Field Survey 2010 and 2011

Table 6: Engel's coefficient among four areas in both coastal area.

	Monthly average food expenditure (RM)	Monthly average expenditure in total (RM)	Engel coefficient (%)
East coast	522.0	1,553.4	33.6
Kelantan	456.7	1,248.1	36.6
Terengganu	582.4	1,854.4	31.4
West coast	705.1	1,629.2	43.3
Kedah	813.8	1,988.9	40.9
Penang	601.6	1,306.8	46.3

Source: Field Survey 2010 and 2011

3.2 Engel Function:

In order to reveal influential determinants Engel's coefficient and food expenditure, we applied three estimation techniques. In order to find out the mechanism between Engel's coefficient and characteristics of demography, we used Working-Lase model. Original form of the estimated model of Working-Laser model was discussed by Working (1943) and Leser (1963). For clarifying the mechanism between percentage of food consumption and characteristics of demography, we used Semi-Logarithmic model and Double-Logarithmic model (Tey 2009 and Chern 2003).

Working-Laser model;
$S_h=a_1+a_2\log(Y_h)+a_3\text{loh}(\text{hhsize}_h)+a_4\log(\text{age}_h)+a_5\text{location}$

Semi-Logarothmic model;
$EXP_h= b_1+b_2\log(Y_h)+b_3\text{loh}(\text{hhsize}_h)+b_4\log(\text{age}_h)+b_5\text{location}$

Double-Logarithmic model;
$\log EXP_h= b_1+b_2\log(Y_h)+b_3\text{loh}(\text{hhsize}_h)+b_4\log(\text{age}_h)+b_5\text{location}$

Where,
$S_h$is food expenditure share for the h^{th} household,
EXP_h is expenditure in Malaysia ringgit for food expenditure by the h^{th} household,
$\text{Log}(EXP_h)$ is logarithm of expenditure for food expenditure by the h^{th} household,
Y_h is logarithm of monthly income of household h,
$\text{loh}(\text{hhsize}_h)$ is logarithm of household size of household h,
$\log(\text{age}_h)$ is logarithm of household head of household h, and
location is dummy variable; West coast=1, East coast=0.

Table 7 showed the estimates of expenditure and Engel's coefficient in farm household between the both East and West Coast of the Peninsula Malaysia. Among three models, location was the common factor at 1% level that household in the West coast area had higher Engel's coefficient and food expenditure. In the Semi-Logarithmic and Double-Logarithmic models, number of family member were statistically significant with positive signs at 1% level. Larger families spend more on food than smaller families on monetary basis. Between the Working-Laser model and Double-Logarithmic model, age of household head was common determinants with opposite signs. In the Working-Laser model, age of household head had a positive impact, whereas it had a negative one in the Double-Logarithmic model. When age of household head were younger, food expenses were higher in the households. However, in terms of Engel's coefficient in the Working-Laser model, the households had higher percentage of food expense in total household expenditure when household heads were elder. And also household income had a negative impact Engel's coefficient statistically at 10% level. It implied to suggest that households with younger household heads spend more food expense and elder spend less, however, Engel's coefficient was high among the elder household heads because household incomes with elder household heads were limited to total household expenditure.

Table 7: Estimates of expenditure determinants in farm household between the both costal areas.

	Working-Laser			Semi-Logarithmic			Double-Logarithmic		
Variables	Regression coefficient		T-values	Regression coefficient		T-values	Regression coefficient		T-values
Constant	-30.752		-1.244	638.736		1.308	7.369	***	8.921
Household income	-2.056	*	-1.788	-0.259		-0.011	0.003		0.066
Number of family member	-0.514		-0.185	184.463	***	3.358	0.338	***	3.638
Age of housheold head	22.068	***	3.968	-100.543		-0.915	-0.459	**	-2.472
Location (West coast=1, East coast=0)	6.596	***	0.262	176.775	***	3.553	0.360	***	4.278
R	0.376			0.390			0.470		
F-value	6.402			6.987			11.062		
N	160			160			160		

Source: Field Survey 2010 and 2011

Note: *** denotes significant at the 1% probability level.

** denotes significant at the 5% probability level.

* denotes significant at the 10% probability level.

Summary and Conclusion:

Total average expenditures were RM1,248.1 in Kelantan, RM1,854.4 in Terengganu, RM1,988.9 in Kedah and RM1,306.8 in Penang. Among four areas, item of food had large occupancy in monthly household expenditure followed by education, bill payment and fuel and loan. It is clear that food expense, medical care, and bill payment including electricity and water had significant difference between the East and West Coast areas. Especially, food expense had the largest difference between both coastal areas.

The theory of Engel's law stated that household with higher income supposed to have lower percentage of food consumption in household expenditure. In the case of both coastal areas, household income level in the West Coast was higher than East Coast areas. Hypothetically, households in the West Coast should have lower percentage of food expenditure. However, in the reality, the share of food expenditure was higher in the West Coast at 43.3% than the East Coast areas at 33.6% as shown in Engel's coefficient. The tendency of Engel's coefficient seemed irrelevant implying opposite trend from the theory. In terms of Engel's coefficient in each area, the trends of income level and the percentage of food expenditure in household came out opposite of the theory between the both coastal areas. This is due to the subsistence activities in the East Coast areas such as subsistence oriented economy except rice. In the contrary situation, food consumption was strongly influenced by money economy in the West Coast areas.

We found the main determinants of Engel's coefficient and food expenditure to be the location, age of household head, number of family member, and household income. The result indicates that when age of household head was younger, food expenses were higher in the households. However, in terms of Engel's coefficient in the Working-Laser model, elder household heads had higher Engel's coefficient, percentage of food expense in total household expenditure, when household heads were elder with lower income. It implied that households with younger household heads spend more on food expense than the elder house head which spend less. Nevertheless, Engel's coefficient was high among the elder household heads because household incomes were limited to total household expenditure. It is important to consider people's living standard in terms of household expenditure among Malay rice farming villages for rural development through their characteristics of food expenses. This study could reveal that age of household, family size, income and location characterized rural economy concerning expenditure at household level. Similarly because living cost in the West coast area has been higher than the East coast area, it was assumable that they needed to struggle for sustaining their live.

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