

Non-Farm Activities and Time to Exit Poverty: A Case Study in Kedah, Malaysia

Roslan Abdul-Hakim* and Siti Hadijah Che-Mat**

Poverty incidence in Malaysia has declined considerably from 52.4% in 1970 to 3.8% in 2009. In the 10th Malaysia Plan (2010-2015), it is targeted that poverty incidence will be reduced further to 2.0%. However, poverty in the rural areas is relatively higher than in the urban areas. In 2007, poverty incidence in the rural areas is 7.1%, while it is only 2.0% in the urban areas. This implies that to reduce poverty further and achieve the specified target in the 10th Malaysia plan, the bulk of the poverty reduction should come from the rural areas. This raises the question on income growth and the duration of the rural poor to exit from poverty since estimation on the duration of the rural poor to exit poverty is helpful to map the progress towards meeting the target. This paper attempts to shed some lights on this issue by estimating the average time to exit poverty using the Watts poverty index. Our particular interest is on the effect of farmer's participation in non-farm activities on the time to exit poverty. Furthermore, we also investigate whether the location where the farmers reside makes a difference on the duration to exit poverty. Towards this end, we carry out analysis based on primary data collected from farm households in the state of Kedah, Malaysia. The results of our analysis suggest that, with income growing at 6.5%, the rural poor will take an average about seven years to exit poverty. Besides, we also discover those farmers who participate in non-farm activities have shorter duration to exit poverty compared to those who did not participate. Thus, one of the options available to ensure the 10th Malaysia plan target is met is by inducing the farmers to participate in non-farm activities.

JEL Codes: I 32, Q 12 and R 12

1. Introduction

Poverty incidence in Malaysia has declined considerably from 52.4% in 1970 to 3.8% in 2009. In the 10th Malaysia Plan (2010-2015), it is targeted that by the year 2015 the mean income of the bottom 40% of households to be increased from RM1440 in 2009 to RM2300, and that poverty incidence will be reduced further to 2.0%. Notwithstanding the significant decline in aggregate poverty, it is worth mentioning that poverty in the rural areas is relatively higher than in the urban areas. In 2007, poverty incidence in the rural areas is 7.1%, while it is only 2.0% in the urban areas. Thus poverty in Malaysia remains as a rural phenomenon. This implies that to reduce poverty further and achieve

* Assoc. Prof. Dr. Roslan Abdul-Hakim, Department of Economics, College of Arts and Sciences, Universiti Utara Malaysia, 06010 UUM Sintok, Kedah Darul Aman, MALAYSIA. Email: ahroslan@uum.edu.my.

** Dr. Siti Hadijah Che-Mat, Department of Economics, College of Arts and Sciences, Universiti Utara Malaysia, 06010 UUM Sintok, Kedah Darul Aman, MALAYSIA. Corresponding Email: hadijah@uum.edu.my

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the specified target in the 10th Malaysia plan, the bulk of the reduction should come from the reduction of poverty among the rural households. This raises the question on income growth and the duration of the rural poor to exit from poverty. This question is imperative since estimation on the duration of the rural poor to exit poverty is helpful to map the progress towards meeting the target. Since it appears that there is little empirical knowledge available on the duration of the poor in Malaysia to exit poverty, assessment on the duration of the poor, particularly among the rural households, would be useful.

This paper is an attempt to shed some lights on this issue by estimating the Watts poverty index. The advantage of calculating the Watts poverty index is that it will enable analysis to be carried out to examine the impact of different income growth scenarios on the time taken to escape from poverty. Our particular interest is on the impact of farmer's participation in non-farm activities on the time to exit poverty among farmers. Furthermore, we also investigate whether the location where the farmers reside makes a difference on the duration to exit poverty. Towards this end, we carry out analysis based on primary data collected from farm households in the state of Kedah, Malaysia, which has relatively high poverty incidence. The results of our analysis suggest that, with income growing at 5%, the poor among our respondents will take an average about ten years to exit poverty. This finding implies that there is much to be done if the specified target is to be achieved. Besides, we also discover that farmers that participate in non-farm activities have shorter duration to exit poverty compared to those who did not participate. Thus, one of the options available is to induce the farmers to participate in non-farm activities.

2. Literature Review

The rural economy of developing countries has long been regarded as synonymous with agriculture. But in recent years this view has begun to change. Such diverse activities as government, commerce, and services are now seen as providing most income in rural households. Studies have shown that non-farm income increasingly plays an important role and exhibits an increasing share in agricultural household income (De Janvry et.al, 2005; FAO, 1988). Thus, the non-farm (or off-farm) employment has been generally recognised to have the potential in raising agricultural household income, and therefore reducing rural poverty (FAO, 1998; Arif, Nazli and Haq, 2000; Lanjouw and Murgai, 2008; Foster and Rosenzweig, 2004). Non-farm income gradually became an importance source of income for rural households, and served as an engine of growth for rural areas In fact, Ranjan (2006) has pointed out several grounds on the desirability of developing the non-farm sector as a vehicle to reduce rural poverty. Among them are: (i) the growing rural communities cannot be sustained by the agricultural sector alone; (ii) rural economies are not purely agricultural and most of the rural communities derive their incomes from various sources rather than from agriculture per se; (iii) avoid rural-urban migration; (iv) reduce the rural-urban economic disparities; (v) reduce rural unemployment since rural industries are usually labour-intensive and hence, expected to absorb more labour; (vi) intensifies linkages between industry and agriculture, and thus support agricultural growth; (vii) reduce income inequality in the rural areas since the lower income group is expected to

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participate more intensely in non-farm activities; and (viii) encourage the participation of women in the non-farm sectors and hence empowering them. Adams (2001) in his study in Egypt and Jordan, find that the rural poor receive almost 60 and 20 percent of their income, respectively, from nonfarm sources. Besides, he also found that non farm income has a greater impact on poverty and inequality.

Thus, there are evidences that non farm income increase farmer's income and reduce the number of poor people. However, while the effect of non-farm income on poverty has been extensively investigated, the effect of non farm income on the time taken to exit poverty appears to be lacking, at least as far as Malaysia is concern. Does income from non-farm sources shorten the duration of the poor to exit poverty? This question has been investigated by Gibson and Olivia (2002) in their study on poverty in Papua New Guinea. Their study shows that, under historical growth rates of Papua New Guinea, it would take an average of 20 years for the poor in Papua New Guinea to escape from poverty. Here, we extent Gibson and Olivia (2002) analysis by examining the effect of the diversification into non-farm activities on the duration taken to exit poverty. Basically, this paper asked this question: does farmer's diversification into non-farm activities shorten their time to exit poverty? We provide empirical evidence on this question by using the average exit time measure of poverty developed by Morduch (1998), using primary data gathered among agricultural household in Kedah, Malaysia.

3. Data and Method

The Data and Sample

The data used in this study is primary data which is gathered through a survey carried out on 384 agricultural households in the state of Kedah, Malaysia. The survey is conducted between the month of April and December 2008. A face to face interview were carried out with the the respondents, where they were chosen through a stratified random sampling. Six of the eleven districts in Kedah were chosen in this study. These are Kubang Pasu, Sik, Kota Star, Baling, Kulim and Pulau Langkawi. Table 1 shows the number of respondents by district.

Table 1: Respondents by district

District	Estimated agricultural households	Number of respondents
Kubang pasu	8,736	71
Kota Star	16,541	135
Baling	5,913	48
Kulim	9,455	77
Pulau Langkawi	3,541	29
Sik	2880	23
Total	47,067	384

Source: Population and Family Development Board (2004)

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For each district, the respondent is divided further according to the local economic characteristics (economic structure of the local economy), to investigate its effect on the probability of poverty. In this study, we divide the local economic characteristics into four, which is based on the intensity of agricultural and industrial activities in the area. These are as follows: (i) AREA1 - area which has significant agricultural and industrial activities; (ii) AREA2 - area which has significant agricultural activities but has no or minimal industrial activities; (iii) AREA3 - area which has minimal agricultural activities but also has no or minimal industrial activities; and (iv) AREA4 - area which has minimal agricultural activities, but is a major industrial area.

With regards to the non-farm activity, in this paper we refer non-farm activity as the participation of a farmer (or agricultural household) in remunerative work away from their plot of agricultural land (FAO, 1988). The non-farm job undertaken by the farmer could be permanent or casual in nature, covering both the secondary and tertiary sector of employment (Salter, 1991). Besides, to disaggregate the poor from the non-poor, poverty line income is used. The official gross poverty line income for the state of Kedah in 2009 is RM700¹. Thus, in this study, a farmer with a household income that is equal or more than RM700 is considered non-poor, while a farmer with household income that is less than RM700 is considered as poor.

The Watts Poverty Index and the Duration of Poverty Exit

In this study, we employ Watts poverty index to measure poverty as well as to estimate the average time to exit poverty (Watts, 1968). If and there are i individuals in the population, indexed from 1 to n in ascending order of income and m is the number of people with income y below the poverty line z , then the Watts poverty index, W , can be written as follows:

$$W = \frac{1}{n} \sum_i^m [\ln z - \ln y_i] \quad (1)$$

where,

z = poverty line income

y_i = income of individual i to m

n = total sample

Despite the Watts poverty index has been proposed in the literature quite a long time ago, the index however has never been widely used since this index cannot be cardinally interpreted. Morduch (1998), transforms Watts poverty index to make it more useful and could be applied widely in poverty studies. Specifically, Morduch (1998) divides the Watts poverty index with γ , which is the growth rate of income. The outcome then could be interpreted as the average time needed by the poor to exit poverty, given that the growth rate of income is γ . Thus, following Morduch (1998), for a given income growth rate of γ , the average time for an individual i to exit poverty (i.e. for income of individual i to reach the poverty line income, z) could be written as follows:

¹ e-SINAR.Kedah.gov.my

$$t_j \gamma = \frac{\ln z - \ln y_i}{\gamma} \quad (2)$$

What is more interesting is that, Morduch's transformation of Watts poverty index has enable us not only to estimate the average time to exit poverty for individual i , but we also could estimate the average time to exit poverty for the total individual, N (including those who are not poor; i.e. those $t_j \gamma = 0$). The Morduch's (1998), transformed Watts poverty index, the average time of poverty exit, $t \gamma$, could be written as follows:

$$t \gamma = \frac{1}{n} \sum_{i=1}^n t_j \gamma = \frac{1}{n} \sum_{i=1}^m \frac{\ln z - \ln y_i}{\gamma} = \frac{W}{\gamma} \quad (3)$$

Once the average time to exit poverty for overall sample is obtained, the average time to exit poverty among the poor, $t^p \gamma$, could be obtained by dividing $t \gamma$ with the poverty headcount ratio, P_0 , as follows:

$$t^p \gamma = \frac{t \gamma}{P_0} \quad (4)$$

The head-count ratio, P_0 , is one of the simplest and the most widely used measures of poverty. The head-count ratio is basically the proportion of total population whose income falls below the specified poverty line. Thus, suppose there are n households, whose income is y_1, y_2, \dots, y_n . Let z be the income poverty line, and there are m households with income y_1, y_2, \dots, y_m , that are less than (or equal to) z , then the head count ratio (P_0) is simply the ratio of m to n , i.e. $P_0(y,z) = m/n$.

4. The Findings

The Incidence of Poverty

Table 2 shows the calculated Watts poverty index as well as the headcount ratio index by the location characteristics of the study area. The Watts poverty index appears to be the highest in AREA3 (0.6650), followed by AREA2 (0.0872), AREA1 (0.0386) and AREA4 (0.0145). Interestingly, it appears that the pattern of poverty as indicated by the Watts poverty index is consistent with the headcount ratio index. The head-count ratio shows that the overall poverty incidence among our respondents is 18.11%. Besides, as with the Watts poverty index, the headcount ratio index also shows that poverty is the highest in AREA3, while it is the lowest in AREA4. Thus, the economic characteristics of the local economy seem to have an important bearing on the magnitude of poverty. Our results show that area with extensive industrial activities (AREA4) recorded the lowest poverty incidence, perhaps due to higher employment opportunities, as well as higher wages in the area. Thus, farmers in AREA4 could get additional income by participating

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in non-farm activities. On the other hand, AREA 3 which is characterized by a stagnant local economy, i.e. minimal agricultural and industrial activities, has the highest poverty incidence. Perhaps, in a stagnant local economy (AREA3), farmers did not have the opportunities to diversify their income sources as farmers in AREA4.

Table 2: Index of poverty by location

LOCATION	Watts index	Headcount ratio index
AREA 1	0.0386	12.64%
AREA 2	0.0872	16.54%
AREA 3	0.6650	41.77%
AREA 4	0.0145	4.88%
TOTAL	0.0995	18.11%

Note: Poverty line income, z , is RM700.00; AREA1 - area which has significant agricultural and industrial activities; (ii) AREA2 - area which has significant agricultural activities but has no or minimal industrial activities; (iii) AREA3 - area which has minimal agricultural activities but also has no or minimal industrial activities; and (iv) AREA4 - area which has minimal agricultural activities, but is a major industrial area.

Time of Poverty Exit

Table 3 shows the average time of poverty exit for the poor using hypothetical income growth of 3%, 5%, 6.5%, 8% and 10%. It should be worth mentioning here that the hypothetical income growth rate of 6.5% is actually the expected economic growth rate in the 10th Malaysia Plan. The average time of poverty exit is calculated for two groups of farmers – those farmers that derived their household income from farm sources only and also for farmers that participate in non-farm employment, and hence derived household income from both farm and non-farm sources. The results shown in Table 3 clearly indicate that as the hypothetical income growth is raised gradually from 3% to 10%, the average time for poverty exit for both groups gradually shorten.

Table 3: Average time of poverty exit (for poor)

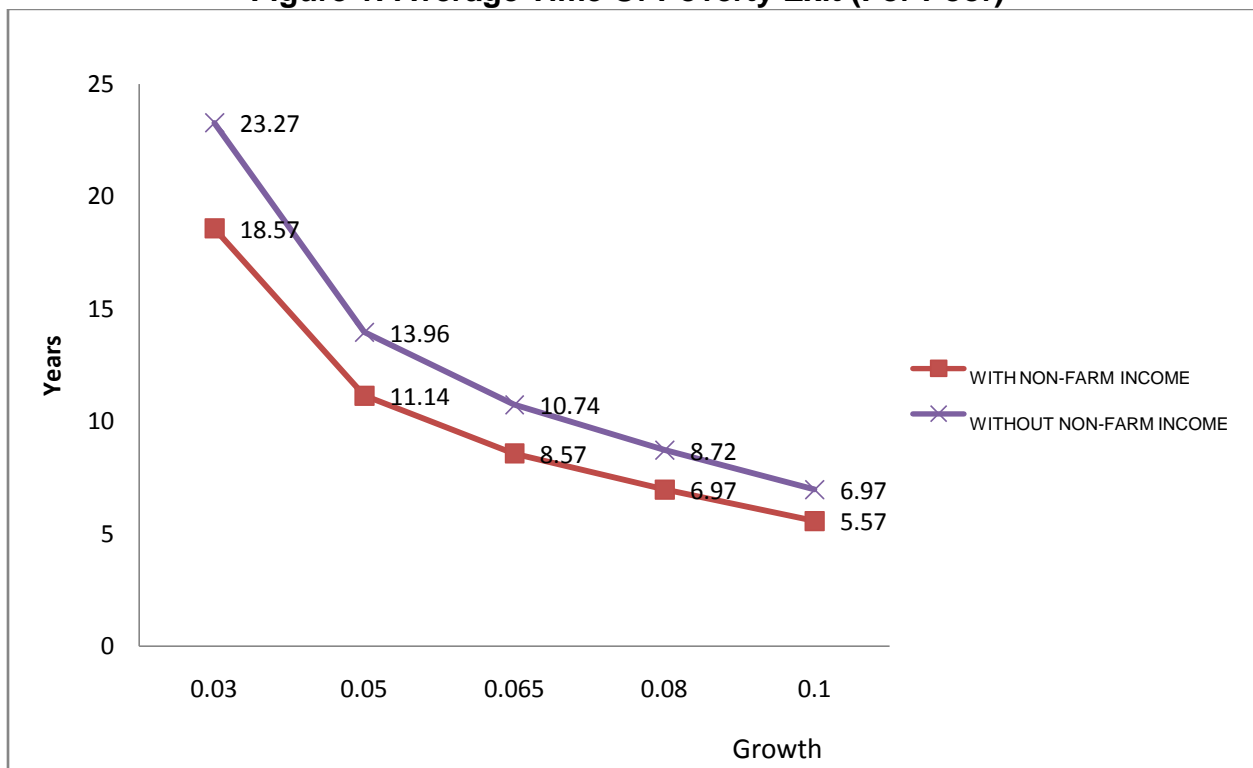
Hypothetical growth rate of income (γ)	Farm income Only $m=156, P_o=40.94\%$		Total Income (Farm + Non-Farm Income) $m=90, P_o= 24.00\%$	
	Average time of poverty exit for all respondents, i.e. t^γ	Average time of poverty exit for all the poor, i.e. $t^p \gamma$	Average time of poverty exit for all respondents, i.e. t^γ	Average time of poverty exit for all the poor, i.e. $t^p \gamma$
0.03	9.53	23.27	4.46	18.57
0.05	5.72	13.96	2.67	11.14
0.065 (Projected growth rate in the 10 th Malaysia Plan)	4.40	10.74	2.06	8.57
0.08	3.58	8.72	1.67	6.97
0.10	2.86	6.97	1.34	5.57

Note: Poverty line income, z , = RM700

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What is more interesting is that there is clear differences in the average time of poverty exit for farmers that derive income from farm activities only and those farmers that derives their household income not only from farm, but also non-farm sources. The results show that farmers that participate in non-farm activities, i.e. derives income from non-farm sources, the average time of poverty exit shorter than those who did not participate in non-farm activities. For instance, if household income of the farmers is growing at 6.5%, as expected in the 10th Malaysia Plan, the average time for the poor to exit poverty is 10.74 years for those poor farmers who derives income from farm sources only, while it is 8.57 years for those poor farmers who also derives income from non-farm sources. With income growing at 6.5%, those farmers that participates in non-farm activities is expected to shorten their average time of poverty exit of about 2 years than those who did not participate (Figure 1).

Figure 1: Average Time Of Poverty Exit (For Poor)



We also calculate the average time of poverty exit for the extreme poor (Table 4). The results appear similar to the earlier results in Table 3. Among the extreme poor, the average time to exit poverty is shorter for those farmers that participate in non-farm activities compared to those who do not (See also Figure 2).

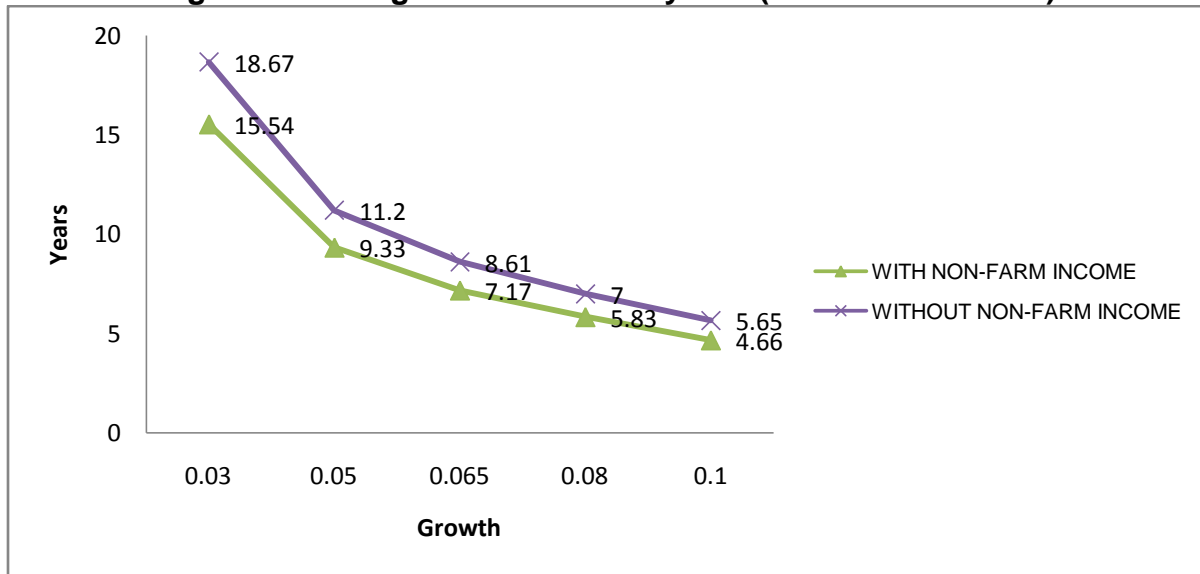
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Table 4: Average time of poverty exit (for extreme poor)

Hypothetical growth rate of income (γ)	Farm income Only <i>m=89, P₀=23.00%</i>		Total Income (Farm + Non-Farm Income) <i>m=43, P₀=0.11</i>	
	Average time of poverty exit for all respondents, i.e. t^γ	Average time of poverty exit for all the poor, i.e. $t^P \gamma$	Average time of poverty exit for all respondents, i.e. t^γ	Average time of poverty exit for all the poor, i.e. $t^P \gamma$
0.03	4.36	18.67	1.75	15.54
0.05	2.62	11.20	1.05	9.33
0.065 (<i>Projected growth rate in the 10th Malaysia Plan</i>)	2.01	8.61	0.81	7.17
0.08	1.64	7.00	0.66	5.83
0.10	1.31	5.65	0.53	4.66

Note: Poverty line income, z , = RM430

Figure 2: Average Time Of Poverty Exit (For Extreme Poor)



Since the opportunity to diversify into non-farm activities might be related to the local economic characteristics, here we also investigate whether the local economic characteristics where the farmers reside have an impact on the average time of poverty exit. As being mentioned in the earlier section, we divide the local economic characteristics into four, which is based on the intensity of agricultural and industrial activities in the area. Table 5 shows the average time of poverty exit by location (local economic characteristics).

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Table 5: Average time of poverty exit (for poor) by location

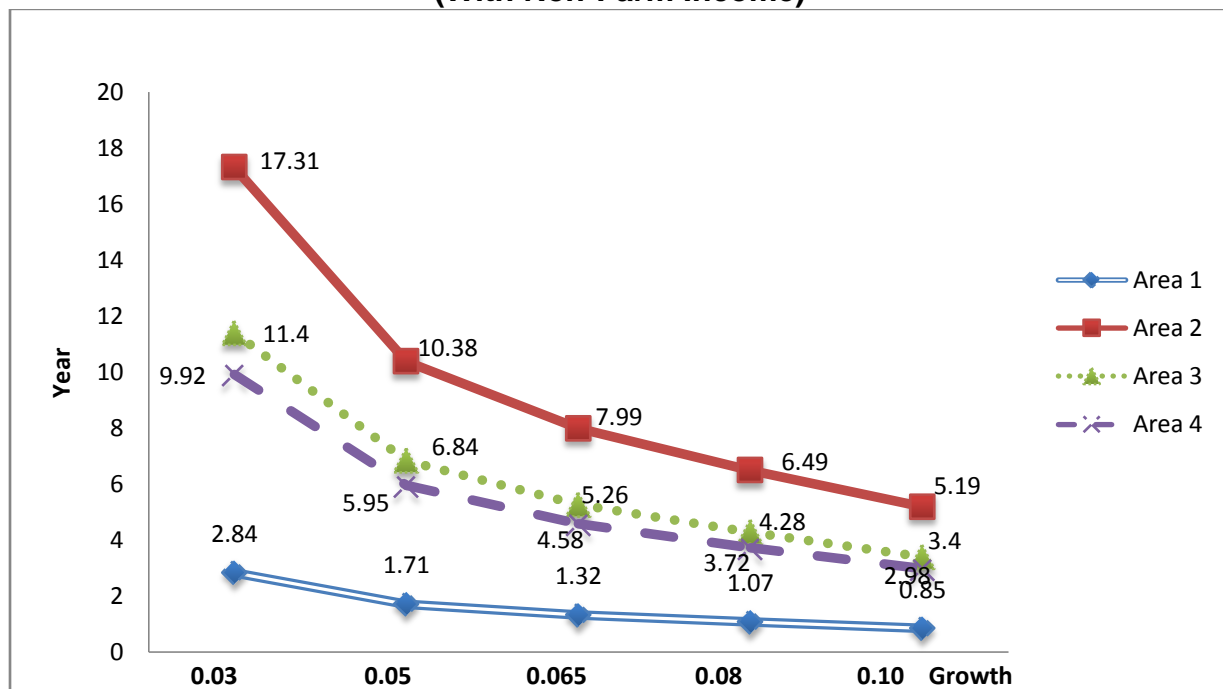
Hypothetical growth rate of income (γ)	Farm income Only		Total Income (Farm + Non-Farm Income)	
	Average time of poverty exit for all respondents, i.e. t^γ	Average time of poverty exit for all the poor, i.e. $t^P \gamma$	Average time of poverty exit for all respondents, i.e. t^γ	Average time of poverty exit for all the poor, i.e. $t^P \gamma$
AREA1				
0.03	3.41	11.41	0.29	2.84
0.05	2.05	6.85	0.17	1.71
0.065 (Projected growth rate in the 10 th Malaysia Plan)	1.57	5.26	0.14	1.32
0.08	1.28	4.28	0.11	1.07
0.10	1.02	3.42	0.09	0.85
AREA2				
0.03	13.39	27.39	2.88	17.31
0.05	8.03	16.46	1.73	10.38
0.065 (Projected growth rate in the 10 th Malaysia Plan)	6.18	12.64	1.33	7.99
0.08	5.02	10.27	1.08	6.49
0.10	4.01	8.22	0.87	5.19
AREA3				
0.03	4.33	15.55	2.17	11.40
0.05	2.59	9.28	1.30	6.84
0.065 (Projected growth rate in the 10 th Malaysia Plan)	1.99	7.14	1.00	5.26
0.08	1.62	5.80	0.81	4.28
0.10	1.29	4.64	0.65	3.40
AREA4				
0.03	4.77	16.45	0.48	9.92
0.05	2.86	9.87	0.29	5.95
0.065 (Projected growth rate in the 10 th Malaysia Plan)	2.20	7.59	0.22	4.58
0.08	1.79	6.17	0.18	3.72
0.10	1.43	4.94	0.15	2.98

Note: Poverty line income, z , = RM700. AREA1 - area which has significant agricultural and industrial activities; (ii) AREA2 - area which has significant agricultural activities but has no or minimal industrial activities; (iii) AREA3 - area which has minimal agricultural activities but also has no or minimal industrial activities; and (iv) AREA4 - area which has minimal agricultural activities, but is a major industrial area.

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Our findings show that farmers that reside in an area where the local economy is characterised by extensive agricultural and industrial activities (AREA1), their average time of poverty exit is the shortest (Figure 3). In contrast, the average time of poverty exit for farmers that reside in an area where the local economy is characterised by extensive agricultural activities but lacking of industrial activities (AREA2) is significantly longer. For instance, if household income of the farmers is growing at 6.5%, as expected in the 10th Malaysia Plan, the poor farmers that reside in AREA1 will take only 1.32 years to exit poverty, while it takes 5.26 years for the poor farmers in AREA2. Our results appear to lend support to our preconceived view that farmer who lives in areas where industrial activities is high will have higher probability to diversify into non-farm activities. Consequently, this will help increase their income and hence, push them out of poverty. In areas where the main economic activities are agriculture and there are little industrial activities, there is lower probability for the farmer to diversify into non-farm activities. As a result, farmer in this area derives their income mainly from agricultural activities. As there are no additional income sources, this will require them longer period to exit from poverty.

Figure 3: Average Time Of Poverty Exit (For Poor) By Location (With Non-Farm Income)



Note: AREA1 - area which has significant agricultural and industrial activities; (ii) AREA2 - area which has significant agricultural activities but has no or minimal industrial activities; (iii) AREA3 - area which has minimal agricultural activities but also has no or minimal industrial activities; and (iv) AREA4 - area which has minimal agricultural activities, but is a major industrial area.

5. Conclusion

Raising income of the poor farmers appears to be crucial in poverty eradication as well for them to escape from poverty. There are various ways to accomplish this objective. First, raising income of the farmers could be attained by agricultural diversification and/or intensification. Second, the farmer could also increase their income by participating in non-farm activities. The question then, which strategy is better for the farmers to exit poverty? Our study reveals that while agricultural intensification and diversification may increase income of the farmers, it did not seem however be a good strategy for escaping poverty. We discover that farmers that participate in non-farm activities, i.e. those derives income from both farm and non-farm sources, has a clearly shorter average time to exit from poverty than those who did not participate in non-farm activities. Furthermore, we also find that the average time taken to exit poverty is also influence by the structure of the local economy where the farmers reside. Farmer that resides in an area where there is high intensity of agricultural and industrial activities has shorter time to exit poverty. Our findings imply that, the average time to exit from poverty could be shortened by inducing the poor farmers to participate in non-farm employment.

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