

Nonfarm Income and Income Inequality in Rural Kedah

Siti Hadijah Che Mat*, Ahmad Zafarullah Abdul Jalil**
and Mukaramah Harun***

This article used decomposition of Gini coefficient to examine the impact of different sources of income - farm income, nonfarm income and non employment income on income inequality. This study used primary data, collected among agricultural households in Kedah Darul Aman. About 384 respondents are chosen based on two stage stratified random sampling and quota. The findings of this study show that nonfarm income sources contributed about one-third of the total agricultural household income. Furthermore, decomposition of the Gini coefficient uncovers that nonfarm income sources is an income dis-equalising factor or has a positive impact on income inequality. In this study, a one percent marginal increase in nonfarm income will cause the Gini coefficient of overall income to increase by 3.85 percent. The reason for this difference has to do with land, which is distributed very unevenly. The policy implication of this study is, nonfarm income activities should be encouraged among agricultural households as this would raise their income and hence, reduce poverty among them. However, it should be focused on value-added activities, especially on the lower income group to improve the income inequality.

JEL Codes: I 32, Q 12 and R 12

1. Introduction

In the past many researchers have viewed the rural economy of developing countries as being synonymous with agriculture. But in more recent year, this view has begun to change. With the rapid growth and the structural changes experienced by the Malaysian economy during these last few decades, has shifted the Malaysian economy in terms of output and employment from agriculture to industrial and services sectors. Consequently, the rural economy changes too.

Rural industrialization programmes, improvement in rural infrastructure and transportation, as well as other rural development programmes undertaken by the government to develop the rural areas may have directly or indirectly open up the opportunities for nonfarm employment. Thus, nonfarm employment perhaps provides an important source of employment diversification for rural households.

*Dr. Siti Hadijah Che Mat, Senior Lecturer, Department of Economic and Agribusiness, College of Business, Universiti Utara Malaysia, Malaysia. Corresponding Email: hadijah@uum.edu.my

**Dr. Ahmad Zafarullah Abdul Jalil, Senior Lecturer, Islamic Business School, College of Business, Universiti Utara Malaysia, Malaysia.

***Dr. Mukaramah Harun, Senior Lecturer, Department of Economic and Agribusiness, College of Business, Universiti Utara Malaysia, Malaysia.

As a consequent, the arising of opportunities for diversification of income sources of rural households might have also changed the structure of rural household income and might have significant consequences on poverty and income inequality. Normally, when farmer do an extra work (nonfarm activities), they will get more income and consequently reduce poverty. But will this extra work (nonfarm activities) will also reduce the income inequality or increase the income inequality? There are reasons to believe that promoting the nonfarm activities, and encouraging farmers to participate in nonfarm employment, might not necessarily reduce income inequality. This would be the case if those who secure the nonfarm jobs are mostly the non-poor farmers. The accessibility of the poor farmers to nonfarm employment might be limited, for instance, due to their lower level of education. Thus the rich farmer become richer and the poor farmer become poorest. Another question arise in this article is non-farm income increase the income inequality among the farmer, what cause it? In this paper, the impact of non-farm income on the income inequality is investigated. The empirical evidence on this question is provided by using a decomposition of Gini coefficient using primary data gathered from agricultural household in Kedah, Malaysia.

2. Literature Review

In the past, to address the problem of rural poverty and inequality, the focus of the government is usually on the growth and development of the agricultural sector. For instance, various efforts have been done to increase the efficiency and productivity of the farmers and the agricultural sector such as through improvement in irrigation, introduction of new varieties, and adoption of better agricultural management and practices. Higher efficiency and productivity is expected to result in improve income and standard of living of the agricultural household. However, the potential of the non-farm sector to play an important role in addressing rural poverty become a consideration since studies have found that non-farm income become an increasing share in agricultural household income (FAO 1998; Arif, Nazli and Haq 2000; Lanjouw and Murgai, 2008; Foster and Rosenzweig, 2004). Indeed, Ranjan (2006) has pointed out several grounds on the desirability of developing the nonfarm 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 participate more intensely in nonfarm activities; and (viii) encourage the participation of women in the non-farm sectors and hence empowering them. The potentials of nonfarm sector to play an important role in addressing rural poverty have incited many studies, particularly in the developing countries, to investigate factors that influence of farmer's participation in nonfarm employment.

In Malaysia, this issue has been investigated for instance by Corner (1981), Shand and Chew (1983), Shand (1986), and Norsida and Sadiya (2009). Corner (1981)

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investigates paddy farmers in the Muda Agricultural Development Authority (MADA) area. He argued that, to address the problem of poverty in the MADA area, the expansion of nonfarm employment is essential since it is nearly impossible to increase farm income of the majority of small paddy farmers above the poverty level without huge government subsidies. He argued further that the income gap between the small and large farms is unlikely to be reduced simply through agricultural strategy. On the other hand, Shand and Chew (1983) examine farmers in Kemubu area. They found that majority of farm households in Kemubu area participated in off-farm employment. Indeed, they also found that most of the farm households in the Kemubu area depend on off-farm employment to complement their farm income. Another study in the Kemubu area was done by Shand (1986). He examines factors that determine farm and off-farm allocation of labour. His findings show that the high level of mechanization in the Kemubu area has resulted in underutilisation of farm labour. He argued that creating more non-farm employment opportunities in the area could exploit this surplus of farm labour and hence, could increase their income and standard of living.

Adams (2001) on his study at Egypt and Jordan, find that nonfarm income has a greater impact on poverty and inequality. The poor receive almost 60 percent of their income from nonfarm sources in rural Egypt, while in rural Jordan they receive less than 20 percent. Many study shows that nonfarm income will increase farmers income and reduce the number of poor people. Our study beforeⁱ also found that nonfarm income is one of the significant factor that determine why poor agricultural household keep on going poor. Our study on time exit povertyⁱⁱ also found that farmers that participate in nonfarm activities, has a clearly shorter average time to exit from poverty than those who did not participate in nonfarm activities. In this study we go a step further by investigating to the income inequality. Specifically we try to investigate whether the nonfarm activities will give a positive impact or negative impact on income inequality among agricultural household.

3. Data and Methodology

Data

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 was carried out with 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)

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) C1 means the farmer in this area have an advantage of high intensity of agricultural and industrial activities; (ii) C2 means the farmer in this area have an advantage on agricultural activities but has no or minimal industrial activities; (iii) C3, is the area which has minimal agricultural activities but also has no or minimal industrial activities; and (iv) C4, refer to the area which has minimal agricultural activities, but high intensity in industrial activities.

Sources of Income

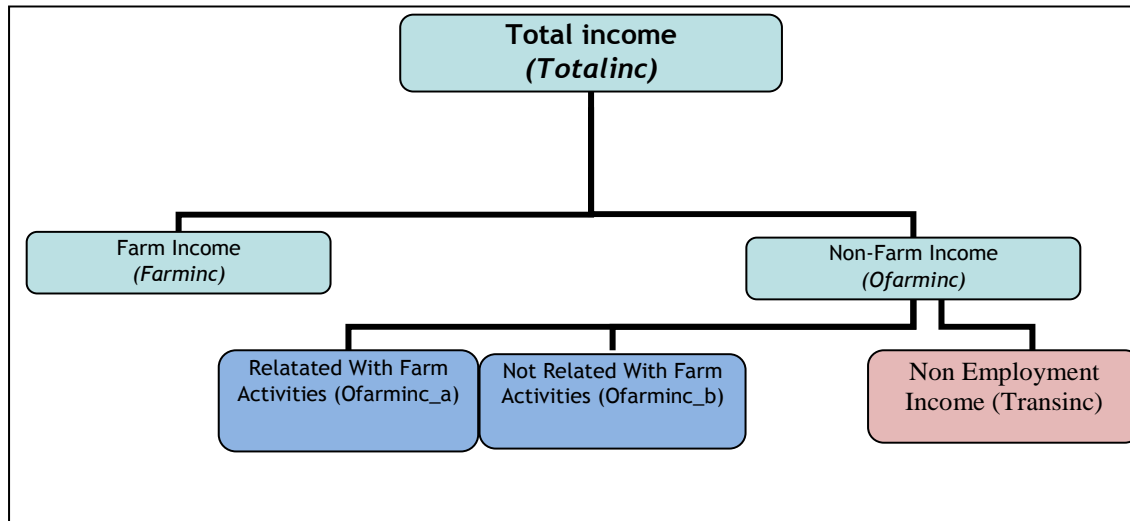
The survey was comprehensive, collecting detail information on a wide range of topics, including income from agricultural activities, income from other economic activities, unearned income, education, expenditure and time their spent on agricultural activities as well as on nonfarm activities. But in this paper, we just used the information on income receive by the agricultural household. In this paper we also divide the total income receive by the household in to three separate item, one is for agricultural income, second is income from nonfarm activities and the third one is unearned income (transfer payment) or we call it as non-employment work. In this paper we refer nonfarm income as income received by agricultural household in remunerative work away from their plot of agricultural land (FAO, 1998). The nonfarm job undertaken by the farmer could be permanent or casual in nature, covering both the secondary and tertiary sector of employment (Salter, 1991).

Generally the farmers' total income (Totalinc) comes from sources of agricultural income (Farminc) and nonfarm income (Ofarminc). Agricultural income (Farminc) in this study refers to any income from agricultural activities (agricultural output of crude product), including self-employment in agriculture, sales, wages received from working on agricultural activities in the farm level. Apart from agricultural income sources (Farminc), households may have earned income from nonfarm activities (Ofarminc). Nonfarm income (Ofarminc) may come from three sources, namely: i) Income received from activities related to agricultural (Ofarminc_a) ii) Income received from activities not related to agricultural activities (Ofarminc_b) iii) Income from non employment

(Transinc). This includes the acceptance of charity, pension, income received from children and others.

For this study, non-agricultural income (Ofarminc_a and Ofarminc_b) are merged with the name of nonfarm income (Ofarminc) while non-employment income (Transinc) is another category. Figure 1, illustrates the household income categories, as mentioned earlier.

Figure 1: Sources of Income



Methodology

According to Foster (1985), any decomposable inequality measure should have five basic properties. They are: (1) Pigou-Dalton transfer sensitivity, (2) symmetry, (3) mean independence (4) population homogeneity, and (5) decomposability. There are many measurement methods to measure inequality that meet the five characteristics as mentioned before. Among them is Theil's entropy index T, Theil's second measure L, the coefficient of variation and Gini coefficient. However, the two Theil measures cannot separate the income when income is overlap. Since the households in this study are mostly received income from several different sources, then the Theil unsuitable. One of the measures of inequality which meets the five preceding properties is the Gini coefficient.

The Decomposition of Gini Coefficient

To measure the contribution or the impact of non-farm income to the income inequality, we used the decomposition of Gini coefficient. By using this techniques we can see which income i.e farm income, non-farm income or non employment income (transfer payments) contributed significantly to the incomes inequality.

As mention earlier the decomposition of Gini coefficient is able to give an answer about which one source of income that contributes to income inequality. Assuming y_1, y_2, \dots, y_k , refers to the K components of income household and y_0 refers to total income of household , then y_0 is

$$y_o = \sum_{k=1}^K y_k \quad (1)$$

This study uses approach introduced by Lerman and Yitzhaki (1985) to explain which sources contribute more to inequality income. According to Lerman and Yitzhaki (1985), the Gini coefficient for total income inequality, G are as follows:

$$G = \sum_{k=1}^K R_k G_k S_k \quad (2)$$

Where S_k is the share of income component k in total income G_k is the Gini coefficient measuring the inequality within the sample of income from source k , and R_k is the Gini correlation between source k income and total income.

Then Stark, Taylor and Yitzhaki (1986), shows by using the Gini decomposition, we can estimate the effect of small changes in a particular source of income on inequality (marginal effects), assuming the income from other sources of income is constant. The percentage change in income (π) on the total inequality, shown as follows:

$$\frac{\partial G}{\partial \pi} = S_k (G_k R_k - G) \quad (3)$$

4. Finding

From 384 questionnaire only 381 are used. From 381 respondents interviewed, only 122 households (32 percent) have nonfarm income. Table 2, summarizes the sources of income held by households. It shows clearly that the importance of nonfarm income other than agricultural income. Agricultural income shows the most important source of income with a total of 62.21 per cent to total income. Nonfarm income and non-employment income contributed about 35.35 per cent and 5.44 per cent to total household income respectively.

Average income received by households regardless of non-farm income and non-employment income is RM1, 310.29. However, after taking into account the income derived from non-farm sources of income, the average income increase of RM681.34 to become an average income of RM1, 991.63. This means that nonfarm income could make the average income of farmers increased.

Table 2: Summary three source of farmer income

Source of income	Average income per month (RM)	% source of income
Farm Income (<i>Farminc</i>)	1,310.29	62.21
Non-farm income (<i>Ofarminc</i>)	681.34	32.35
Non-employment income (<i>Transinc</i>)	114.66	5.44
Total Income (<i>Totalinc</i>)	2,106.29	100.00

Number of responden = 381

Income Inequality in Rural Kedah

Decomposing the Gini coefficient provides two ways of measuring the contribution of any income source to overall income inequality. First, it is possible to identify how much of overall income inequality is due to any particular source of income. Second, it can be asked whether inequality in an income source serve to increase or decrease overall income inequality.

This study uses the instructions in the program *stata-descogini*, written by Lopez-Feldman (2006). Under this method, how large the contribution of a particular source of income to total income inequality can be known. We also can find out whether inequality in income cause increases or decrease in overall income inequality.

Table 3, shows the results of decomposition Gini analysis for the entire household. The first column (1) of (*Sk*) shows the contribution of particular income sources to overall income. As expected farm income is the main source of income for rural household in the study area. Farm income contributes more than 60 percent of the total income of all households compared to nonfarm income contribution about 32 percent.

The second column (2) is Gini coefficients (*Gk*), which showed equity in income distribution or inequality for each source of income. The first line of farm income (*Farminc*), shows the distribution of income from agricultural sources received by households without the presence of nonfarm income (*Ofarminc*) and non-employment income (*Transinc*). By comparing the figures (*Gk*) for each source to the total number of *Gk*, we get the effect that resources either increase / decrease to the total income inequality. In this study, the overall income inequality dropped when the nonfarm income and non employment income is taken into consideration along with farm income. For farm income, the Gini coefficient dropped by 6:35 per cent, that is from 0.4804 to 0.4169.

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Table 3: Decomposition of Non-farm Income Inequality in Rural Kedah

Income Source	Share in non-farm income (S_k)	Gini coefficient for income source (G_k)	Gini Correlation with total income (R_k)	Relative contribution ($S_k \cdot R_k \cdot G_k / G$) @syer	Relative marginal effect @ %change
	(1)	(2)	(3)	(4)	(5)
<i>Farminc</i>	0.6221	0.4804	0.8633	0.6188(61.88)	-0.0033
<i>Ofarminc</i>	0.3235	0.6475	0.7203	0.3619 (36.19)	0.0385
<i>Transinc</i>	0.0544	0.7765	0.1897	0.0192 (1.92)	-0.0352
<i>Tot.Income</i>	1.000	0.4169	-	1.000 (100.00)	-

Source: Decomposition analysis on 381 agricultural household.

Distribution of income (G_k) in nonfarm sources of income (*Ofarminc*) is (0.6475) and non employment income (*Transinc*) is (0.7765) was found more skewed than income distribution in the farm income sources (*Farminc*) which is (0.4804). The results show, the nonfarm income (*Ofarminc*) is the second largest contribution ($S_k= 32.35\%$) to total income of all households, but what is worrying is, this source of income is not distributed equally as shown by the value of G_k (0.6475) is much more higher than the value of G_k (0.4804) in farm income. Although the distribution of income by nonfarm income shows a high inequality, but relatively nonfarm income is only accounted for (36.19 per cent) to overall income inequality compared to the percentage contribution of farm income is much larger (61.88 percent) to the whole inequality.

Farm income has a highest value of Gini correlation (R_k) 0.8633, this means that farm income is appealing to many farmers than other income. So it is true indeed a farm income is synonym with farmer in rural areas.

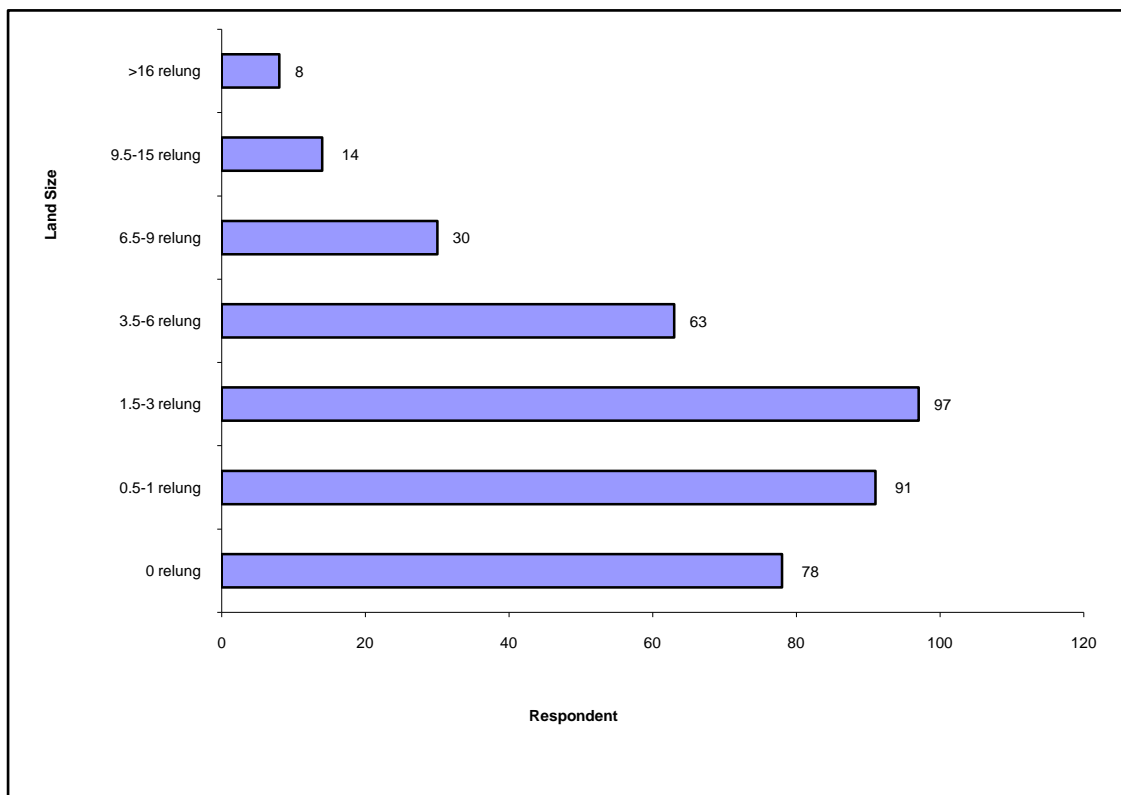
In column (5) we can see the effect of a small change in a source of income on income inequality. The study showed that a 1 percent increase in farm income (*farminc*), assuming other sources of income constant, it will reduce the overall income inequality by 0.3 percent. Similarly, to the non-employment income (*Transinc*), which a 1 percent increase in non-employment sources of income will be reduced overall income inequality by 3.5 percent. In contrast to nonfarm income (*Ofarminc*) 1% increase in nonfarm income, assuming other source of income unchanged, it will result an increase of 3.9 percent of overall income inequality. This result is consistent with findings by Adams (2001) who found that nonfarm income increases the inequality income in Jordan.

One reason to explain why nonfarm income (*Ofarminc*), causing income inequality among farmers, is may because of the factors involvement of farmers in nonfarm activities. It is expected that the size of land is most relevant to explain the uneven distribution of this income.

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The discrepancies in the size of land owned by farmers may be the cause of inequality in nonfarm income and may lead to the total overall income inequality. Some of those farmers who work only on the agricultural land area of 0.5 relung/recesses, and some have up to 40 relung/recesses. Approximately 22% (77) of respondents who owned the land only 0.5 recesses. In contrast, approximately 31% (106) has more than 3.5 relung and above. A total of 73 respondents (21%) have no land at all. They certainly do not have land for farming and agricultural work in the home or their work as a fishermen. This situation is shown in Figure 2. Those who have a large land (over 3.5 recesses), which is 31 per cent, may be able to create non-farm income is higher than those who have small land (less than 3.5 recesses; 69 percent). Adams (2001) found that in Egypt, the factor 'land', which is distributed unevenly is significant in determining the non-farm income and the relationship is negative.

Figure 2: Land Size holding by farmer



Note: 1 eccers = 1.5 relung

5. Conclusions

Reduce the income inequality has been one of the main agenda of development in most developing countries. The observed increase in the share of nonfarm income in total agricultural household income as found in most studies has led to the argument that the nonfarm sector could play an important role in reducing income inequality. This argument need for examination on the impact of the nonfarm income on income

inequality. Here, we provide the evidence from a case study among agricultural households in Kedah, Malaysia. Our study has used decomposition of Gini coefficient analysis on agricultural household data from Kedah to examine the impact of different sources of income- including nonfarm income on rural income inequality. This study shows that nonfarm income has a positive impact on income inequality (inequality-increasing source of income), means a 1 percent marginal increase in nonfarm income will cause the Gini coefficient of overall income to increase by 3.85 percent. The reason for this difference has to do with land, which is distributed very unevenly in this study.

Endnotes

ⁱ Does farmer's diversification into non-farm employment reduce their likelihood of poverty? Evidence from Malaysia by Siti Hadijah CHE MAT and Roslan Abdul-hakim

ⁱⁱ Non-Farm Activities and Time to Exit Poverty: A Case Study in Kedah, Malaysia by Roslan ABDUL-HAKIM and Siti Hadijah CHE-MAT

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