Mobility of Workforce From Agricultural To Non-Agricultural Sectors

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Abstract : *This study aimed to find out the mobility of the agricultural workforces to the non-agricultural sector. This research was conducted in Wonosari Village, T. Morawa Sub-district, Deli Serdang Regency. The research location was determined purposively. Sampling was carried out by "Stratified Random Sampling." From 62 farmer populations in the research area, sampling obtained 62 respondents with 38 farm labourers' and 24 farmers. Data analysis used an average difference test (t-test). The results showed that men who worked as agricultural labourers did working mobility from agriculture were 24.18%, while female respondents were 16.13%. The male respondents working as farmers did working from agriculture to non-agriculture, were 11.29% of women who remained to be farm labourers and farmers. The total of farm labourers who did the working mobility was 40.32% compared to the agricultural sector, which was 12.90%. The income level of workforces that performed working migration (non-farm) was higher than those in the agricultural sector. The average income from the non-agricultural sector was Rp. 1.856.363,64, while from agriculture, was only Rp. 15.200.000,00. There was a difference in income between labour in agricultural and non-agricultural sectors, where the income in the non-agricultural sector was higher than in agriculture. There was no difference in men's and women's employment opportunities in agricultural and non-agricultural sectors in the research areas.*

Keywords: *labour mobility, farm labourers and farmers*

I. INTRODUCTION

People are interested in jobs in the non-agricultural sector to obtain what is available every day. In addition to earning a living from the agricultural sector, according to Notopuro (2002), people supplement their income by their earning in the non-agricultural sector, for example by making small-scale handicraft or trade items. In addition, people are also active in economic activities in the markets and factories as untrained labourers. Furthermore, the emergence of various industrial sectors near the villagers greatly influences the shift of the workforces towards the industry. Today, there are no striking differences between men and women to attain opportunities in the non-agricultural sector, both in terms of education and skills in trade, industry, and others. The inclusion of women in development is not something new, although in general, they are still supporting household income, which is the responsibility of the household head. Based on gender, in general, the number of men working in the agricultural sector in migrants is more significant than that of women. Soentoro (2000) described that in some villages in Sumatra, male labourers ranged from 13-14%, while female workers ranged from 0-46%. A man who is responsible for the livelihood of his family also tends to be more active than women. Research is not always the same, although exploration is a similar problem. This case is due to different environmental factors. The shifting from the agricultural to the non-agricultural sectors can be carried out by commuting (circulation). The examples are the farmers' areas close to the industry and home areas. The shifting should be undertaken by regular transportation, which is relatively low-cost and easy for workers. This activity is commonly called commutation migration (commute) on a working day without staying overnight.

II. RESEARCH METHOD

A. Population Determination

This research was conducted in Wonosari Village, T. Morawa Sub-district, Deli Serdang Regency. This research area was determined intentionally (purposively) based on The average land tenure that is relatively narrow at around 0.25 hectares, in supporting household income—the vast population as farm labourers., The research area that is open for population migration.

B. Sampling

Sampling was carried out directly to the village administrator, where the number of overall migrant populations could be determined. This problem needs to be understood that the populations are those whose heads of households are engaged in agriculture or whose main occupation is in the agricultural sector. They are classified into two groups.

a. The first group consists of those who do not manage a farming business; they are only farm labourers.
b. The second group consists of those who manage a farming business in the form of their own business or rent to others.

The samples were taken (respondents) by using the following formulation:

$$n = \frac{N}{1 + (N\,(Moe)^2)}$$ (Sekaran, 2006)

where :

Moe *Margin of Error Maximum* (a toleratable mistake, 10%)

Sampling was conducted by stratified random sampling. Determining each group sample was executed by using the following formulation:

$$n = \frac{N_1 n}{N}$$ (Supranto, 2003)

where :

n_1: the number of samples in the first group

N_1: the number of populations in the first group

n: the number of all samples of I group

N: the number of populations of all I group

The number of populations and samples who migrated in Wonosari Village can be seen in Table 3.1.

Table 3.1.
Distribution of Populations and Samples who Migrated in Wonosari Village, Tanjung Morawa Sub-District in 2017

Group	Population	Sample
I	97	18
II	65	24
Total	**162**	**62**

Source: Wonosari Village Head's Office, 2017

The work of farm labours is classified into agricultural and non-agricultural sectors. The agricultural sector includes the fields of nursery work, land management, care or maintenance, planting, and harvesting. The workforces in this agricultural sector have reduced because many are moving. Meanwhile, the non-agricultural sector includes the employment of industrial workers, construction workers, and trading.

Data Analysis Method

To identify the result of the proposed hypothesis, the obtained data were analyzed as follow:

1. To test the first hypothesis where the income of farm laborers from the non-agricultural sector was higher than that from the agricultural sector, then the data were tested using a different t-test, where the formulation, according to Amudi Pasaribu (2001), is:

$$t = \frac{\bar{x}_2 - \bar{x}_1}{\sqrt{(n_1 \quad n_2)\, s^2 \,(n \quad n_2)} \quad \frac{1}{n} + \frac{1}{n}}$$

$(n_1 - n_2) -$

where :

$\bar{x}_1$ = average income due to mobility/average working hours of farm labourers in the agricultural sector.

$\bar{x}_2$ = average income due to mobility of average working hours of farm labourers in the non-agricultural sector.

n_1 = the number of samples in group 1

n_2 = the number of samples in group 2

s_1 = variance of agricultural sector

$$s_2^1 \quad \frac{\sum(x_1 - \bar{x}}{n_1 -}$$

s_2 = variantce of non-agricultural sector

$$s_1^2 \quad \sum(x_2 - \bar{x}$$

The form of testing :

H_0: $\mu_1 \geq \mu_2$, means the average income/average working hours of farm labourers in the agricultural sector is higher than that from the non-agricultural sector

H_0: $\mu_1 \leq \mu_2$, means the average income/average working hours of farm labourers in the agricultural sector is lower than that from the non-agricultural sector

The Principles of Testing:

- $T_{count} \leq (n\text{-}1, \alpha/2)$: H_0 is accepted, and H_1 is rejected, which means $\mu\ 1 \geq \mu\ 2$ count
- $T_{count} > t\ (n\text{-}1, \alpha/2)$: H_1 is accepted and H_0 is rejected, which means $\mu\ 1 < \mu\ 2$.

1. To test the second hypothesis, that the average employment opportunity for women is smaller than that for male workforces in the agricultural and non-agricultural sectors, a statistical test was conducted using a single sector test, with alternative hypotheses as follows:

$H_0 : W \geq P$

$H_1 : W < P$

where H0 means there is no difference in the average employment opportunity between female and male farmworkers. H1 means that the average employment opportunity for female agricultural labourers is smaller than that of male agricultural labourers. According to Andi Hakim Nasution (2000), in testing the difference of two average values, if the variance is not different, the t-test is used, while if the variance is different, the Behren and Fisher test is used.

Identifying the variance of different populations needs F-Test with the following formulation:

$$F = \frac{s_1^2}{s_2^2}$$

Where s_1^2 and s_2^2 are the variance of each average value; s_1^2 is symbolized as the highest value, and s_2^2 is symbolized as the lowest value. If V_1 and V_2 are a free degree of s_1^2 and s_2^2, so if:

$F_{count} \geq F(v_1, v_2)$: it means variance is not significantly different, and t-test is used.

$F_{count} > F(v1, v2)$: it means the variance is significantly different, and Behren Fisher test is employed.

To test the difference in average employment opportunity between male and female workers with significantly different variances, the formula of Behren and Fisher test is used as follows (Nasution AH, 2000):

$$t_{count} = \frac{\bar{x}_2 - \bar{x}_1}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

$$t_{count} = \frac{W_1 t(n_1 - n) + W_2 t(n_2 -}{W_1 + W_2}$$

where $w_1 = \frac{s_1^2}{n_1}$ and $w_2 = \frac{s_2^2}{n_2}$

The formulation of t-test used according to AH (2000) is:

$$t = \frac{}{\sqrt{\frac{s_1^2}{} \cdot \frac{s_2^2}{}}} = \frac{}{\sqrt{n_1 r \; n_2 + 2)}}$$

where :

x_1 : the average working hours of female farm workforces

x_2 : the average working hours of male farm workforces

n_1 : the number of samples of female farm workforces

n_2 : the number of samples of male farm workforces

s_1^2 : variance of average working hours of female farm workforces

s_2^2 : variance of average working hours of male farm workforces

The principles of testing:

$T_{count} \leq t_{table}$: H_0 is accepted (the average values are not significantly different).

$T_{count} > t_{table}$: H_0 is accepted (the average values are significantly different).

III. RESEARCH RESULTS AND DISCUSSION

Some factors influence workforces in the village to earn a living outside their village either temporarily or permanently in the future, such as higher costs and more job opportunities. Also, they usually have relatives/acquaintances living and working in the destination area. In addition, in their village, they do not own land and job opportunities, or even their wage is low. They actually have sufficient skills/education to work outside their village. The labor migration is due to the lack of land or having relatively narrow farmland. Other reasons for labor migration are the village could not absorb relatively high laborer growth, while outside the village, the non-agricultural sectors offer relatively high wage and sustainability. Those farmers migrate seasonally when there is no farming activity. By migration, they could increase their income. In fact, migration, based on economic motives, is a voluntary, individual migration. The migrant populations, or migrants, have taken into account the various disadvantages and benefits before deciding to relocate or settle, but there is no compulsory element to migrate. To find the differences between the agricultural and non-agricultural sectors, further tests were performed by first using a t-test to find the standard deviation of income from agricultural and non-agricultural sectors. The formulation used in the calculation is:

$$t = \frac{\bar{x}_2 - \bar{x}_1}{\sqrt{\left(\frac{}{n_1}\right) + \left(\frac{}{n_2}\right)}} \quad \frac{s_1^2}{} \quad \frac{s_2^2}{}$$

$$t = \frac{1{,}856{,}363.64 -}{\sqrt{\left(\frac{300\,857.0}{33}\right) + \left(\frac{311\,115.5}{29}\right)}}$$

$$t = \frac{336{,}363.6}{\sqrt{20{,}117.7}}$$

$$t = \frac{336{,}363.6}{141.8}$$

t = 2371.48

Statistically, the average difference test (t-test) resulted in tcount of 2371.48, which was higher than ttable (1.782) at a 95% confidence level (α0.05). It can be concluded that the H1 hypothesis could be accepted because there were differences in income between labourers in the agricultural and non-agricultural sectors, where non-agricultural labourers' income was higher than that of the agricultural sector. This case was due to a large number of job choices in the non-agricultural sector so that farmers who migrated their work could select jobs with higher salaries adjusted to their expertise. These study results support research conducted by Atik (2006) and Abidib (2003), stating that gender has no significant influence on labour decisions for non-permanent migration. These study results are also in line with the theoretical basis stating that women

migrate at closer distances compared to men. To identify the difference in employment opportunities for men and women in the agricultural sector, the t-test was conducted by first looking for a standard deviation of the percentage of working hours in the agricultural sector for men and women as follows:

$$t = \frac{\bar{x}_2 - \bar{x}_1}{\sqrt{\left(\frac{}{n_1}\right) + \left(\frac{}{n_2}\right)}} \quad s_1^2 \quad s_2^2$$

$$t = \frac{84.41 - 83.03}{\sqrt{\left(\frac{37.09}{22}\right) + \left(\frac{22.14}{16}\right)}}$$

$$t = \frac{1.38}{\sqrt{3.76}}$$

$$t = \frac{1.3}{1.94}$$

t = 0.71

The average difference test (t-test) obtained tcount of 0.71, which was smaller than ttable (1.782) at a 95% confidence level (α0.05). It can be concluded that the H1 hypothesis could be rejected, which means there was no difference in opportunities between male and female workers in the agricultural sector. To identify the difference in employment opportunities for men and women in the non-agricultural sector, the t-test was employed by first looking for a standard deviation of the percentage of non-agricultural sector working hours for men and women as follows:

$$t = \frac{\bar{x}_2 - \bar{x}_1}{\sqrt{\left(\frac{}{n_1}\right) + \left(\frac{}{n_2}\right)}} \quad s_1^2 \quad s_2^2$$

$$t = \frac{63.09 - 58.33}{\sqrt{\left(\frac{54.15}{12}\right) + \left(\frac{01.22}{12}\right)}}$$

$$t = \frac{4.76}{\sqrt{12.11}}$$

$$t = \frac{4.7}{3.48}$$

t = 1.37

The average difference test (t-test) obtained tcount of 1.37, which was smaller than ttable (1.782) at a 95% confidence level (α0.05). It can be concluded that the H1 hypothesis could be rejected, which means there was no opportunity difference between male and female workers in the non-agricultural sector.

From the above description, it can be concluded that there was no difference in male and female employment opportunities in the agricultural and non-agricultural sectors in this study area. The results showed that farmers who worked in the non-agricultural sector (which carried out the migration of jobs) had higher income levels than in the agricultural sector. The level of income in non-agricultural sector was higher than that in the agricultural sector. The average income in the non-agricultural sector was Rp. 1,856,363.64, while in the agricultural sector was only Rp. 1,520,000.00. This finding concludes that the lower the income received by workers in the home base area, the higher the decision of workers to migrate to other regions.

These study results are supported by Utomo's research (2014) finding that from various reasons, the movement of female workforces to the industrial sector was because working in the agricultural sector was seasonal with uncertain income; the wages in the agricultural sector were much smaller compared to the salaries in the industrial sector. Therefore, many female workers chose to work in the industrial sector, while, according to them, the education they took was inappropriate if they had to work in the fields. The results showed that there were differences in male and female employment opportunities in the agricultural and non-agricultural sectors in this study area. This case was due to the increasing population, which caused a lack of employment.

According to Soekartawi (1995), the increase in the population in rural areas could cause difficulties in finding productive employment in the agricultural sector, thus encouraging workers to switch to the non-agricultural sector. This phenomenon is real for many female workforces who only work on other people's agricultural land as agricultural labourers. Besides, another cause of the movement of female workers from the agricultural to the industrial sectors is the opening of industrial sector opportunities for rural women. The women's income in rural areas was not only from the agricultural sector, which traditionally dominated the work of the rural population but in the formal sector, and they also worked in the manufacturing sector. Meanwhile, in the informal sector, rural women could work in home industries, commerce, and services

IV. CONCLUSION AND RECOMMENDATION

A. Conclusion

Men who work as farm labourers did more job mobilities from agriculture to non-agriculture areas compared to female respondents. The level of income of people migrating for work (non-agricultural) was higher than that of the agricultural sector. There was a difference in income between labour in the agricultural and non-agricultural sectors, where non-agricultural labour income was higher than the agricultural sector worker income. There was no difference between male and female employment opportunities in the agricultural and non-agricultural sectors in this study area.

B. Recommendation

If the workforce shifting from the agricultural to the non-agricultural sector occurs continuously, it will result in an increasingly scarce workforce in rural areas, especially female workers. At present, there is still a great need for female workers in the agricultural sector, especially during the planting and harvesting periods. The movement of workers to the non-agricultural sector (industry) will cause the agricultural sector difficult in finding workers because the non-agricultural sector is increasingly attracting the interest of young workforces. For this matter, there should be great attention to the workforce from the agricultural sector so that they do not bring negative impacts but benefits to the community. The main factor of labour migration from the agricultural to the non-agricultural sector is the lower salary rates in the agricultural sector.

For this reason, it is necessary to improve the salaries, especially for farm labourers, and also proper planning in rural development so that there is no eviction of productive agricultural land to be converted, which ultimately has a negative impact on the agriculture sector. The government should create and provide the impetus and facilities needed by farmers to obtain the necessary inputs so that farm labourers can increase their income. This case is due to not only the characteristics of the majority of people living in rural areas but also the unemployment problem getting more prominent and requiring to be resolved.

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