Improved Dairy and Meat Goat Production for Small-scale Farmers in Asia

Proceedings of the International Seminar on Production Increases in Meat and Dairy Goats by Incremental Improvements in Technology and Infrastructure for Small-scale Farmers in Asia August 04-08, 2008, Bogor, Indonesia

Food and Fertilizer Technology Center for the Asian and Pacific Region
Indonesian Research Institute for Animal Production
Livestock Research Institute, Council of Agriculture, Taiwan ROC
Improved Dairy and Meat Goat Production
For Small-scale Farmers in Asia

Supporting papers

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Seminar on Production Increase in Meat and Dairy Goats
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CONTRIBUTION OF FAMILY LABOR ALLOCATION FOR DAIRY GOAT FARMING TO AGRICULTURAL FARMING ACTIVITIES

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ABSTRACT

The objectives of the study were (1) to analyze the allocation of family labor for dairy goat farming and crop farming, (2) to calculate the contribution of family labor allocation for dairy goat farming in agricultural farming activities, and (3) to analyze the farmer’s characteristics influencing the contribution of family labor allocation for dairy goat farming to agricultural farming activities. Thirty member of dairy goat farmers group of Pangerku, were chosen by purposive convenience sampling methods for sample. The data were analyzed using descriptive analysis and multiple linear regression analysis. The results of the study showed that the allocation of family labor for dairy goat farming was 258.80 Man Days/year and for crop farming was 215.29 Man Days/year. The total of family labor allocation for agricultural farming activities was 474.19 Man Days/year, while the availability of family labor allocation involved in agricultural farming was 492 Man Days/year. The contribution of family labor allocation for dairy goat farming to the agricultural farming activities was 54.58% whilsts dairy goat farming activities contributed 56.46% of income to the total income of agricultural farming activities. The characteristics of farmer influenced the contribution of family labor allocation for dairy goat farming to agricultural farming activities and could be formulated as follow: \[ Y = 31.782 + 7.425 X_1 + 0.266 X_2 \], where \( X_1 \) was the age of farmer (years) and \( X_2 \) was the number of animal ownership (animal unit). The conclusions of the study were (1) the allocation of family labor for dairy goat farming was greater than for crop farming, (2) more than 50% of family labor allocation for agricultural farming activities was contributed for the dairy goat farming activities, and (3) the older of the farmers and the greater of animal ownership keeping by the farmer increased the contribution of family labor allocation for dairy goat farming to agricultural farming activities.

Keywords: family labor, dairy goat farming

INTRODUCTION

Livestock development can not be separated from agricultural development in general. In reality, the main factor of agricultural development is the small farmers. Most of the livestock farming in Indonesia was held by small farmers, and the family based smallholder livestock farming system, however, will continue to be the dominant production system (Devendra, 2002). It means that livestock is one of the farm enterprises using most of labor intensive (Pepasari, 2000). Agricultural farming and livestock farming can not give more benefit for increasing the farmers' welfare if they were managed independently. The roles of livestock farming as a part of the integrated system with the other agricultural farming were: it provide a supply of organic fertilizer through the animal waste and it can use the plants as their feed. In addition the animal can be as a capital asset or as the source of cash when the farmers need an urgent cash (Maylinda et al., 2003). But, the role of livestock in the livelihood of the farmers has not been properly appreciated (Udo, 2002).

As a sub sector in agricultural system, the position of livestock farming always supports agricultural farming enterprises. Actually, livestock farming could be the main enterprises in the agricultural farming system when they are exerted in a good management. It can be showed that the livestock farming used more of farmers’ labor. If the allocation of that farmers’ labor can be used optimally, the livestock farming can be more developed not only as supporting for agricultural enterprises.

One of the livestocks that was developed in Sleman Regency is Etawah Crossed Bred goat, especially at Turi District. Keeping dairy goat by farmers around Turi is directed mainly to produce kids, manure and milk. The population of this dairy goat in Sleman Regency was 20,000 goats, and of 3,683 goats just recently developed with the capability for producing milk. Their milk production was 50,000 liters/year (Anonymous, 2005). Besides keeping dairy goats, the farmers in
Turi District also cultivate fruit crop namely salak (snake fruit). This type of fruit becomes the main source of income for people in this area.

The limitation of the land ownership causes the farmers could not rely on salak farming as the only income. The number of labor force always increase while the availability of land is limited. This condition cause the farmers’ labors could not be accommodated only in the salak farming activities. Therefore the farmers should develop other opportunities for employment outside the crop farming i.e. developing dairy goat farming activities. The effort to increase goat management should be synchronised with the effort to increase salak production. In this case, the activity of farmers should be directed toward good sharing of labour between salak and goat production.

MATERIALS AND METHODS

The research was a case study at the dairy goat farmers’ group of Pangestu in Turi District, Sleman Regency Yogyakarta. The number of respondent involved in this study was 30 farmers. Purposive convenience sampling method was used to choose the respondents. The respondents must be still keeping dairy goats and farming salak when the study was carried out. The allocation of family labour for dairy goats and salak farming was calculated in working hours per day. The working hour was converted into man-working-hours (JKSP). One JKSP equals to one working hour for man with the age of 15-65 years old. One working hour for woman with the age of 15-65 years old equals to 0.75 JKSP. For children with the age of 10-14 years old, both son and daughter, one working hour equals to 0.5 JKSP. The allocation of family labour for dairy goats and salak farming was converted into man-working-days (HOK)/Animal Unit (AU)/year and man-working-days (HOK)/ha/year respectively. One man-working-day (HOK) equals to 8 JKSP (Adiwilaga et al., Sudarmanto, et al., 2005).

The number of family labour availability was calculated based on the following formulas:
For man with the age of 15-65 years old:

\[
\text{Number of family member (JKSP)} \times 6 \text{ hours} \times 300 \text{ days}
\]

8

For woman with age of 15-65 years old:

\[
\text{Number of family member (JKSP)} \times 4 \text{ hours} \times 300 \text{ days}
\]

8

For children with the age of 10-14 years old:

\[
\text{Number of family member (JKSP)} \times 3 \text{ hours} \times 300 \text{ days}
\]

8

Contribution of family labor allocation for dairy goat farming to agricultural farming activities was calculated by dividing the allocation of family labor for goat farming to the total allocation of family labor for goat farming and salak farming (HOK/year). Multiple linear regression model was applied to analyzed the influence of farmers characteristics on the contribution of family labor allocation in dairy goat farming activities. The parameters of farmer’s characteristics recorded were: age, length of formal education, number of family labor availability, ratio between man labor and women labor, land ownership, animal ownership, length of their experience in salak farming, and length of their experience in goat farming.

RESULTS AND DISCUSSION

Table 1 showed that cutting forages activity was the longest man-working-days allocation (52.16%), while processing manure activity was the shortest man-working-days allocation (0.97%). The total of family labor allocation for dairy goat farming was 258.80 HOK/year (Table 1). The family labor of man spent more man-working-days allocation than woman. The family labor of woman was not involved in forage planting for feeding, processing manure, and training/extension activities. The total of family labor allocation for salak farming was 215.39 HOK/year (Table 2). Man labor expended 158.76 HOK/year and woman labor expended 56.63 HOK/year. Salak farming activities, which were fully done by man-labor, were land cultivating, planting, and
pollinating. Woman labor was not involved in these activities because these activities needed more time and quite hard work.

Table 1. The average of family labor allocation for dairy goat farming

<table>
<thead>
<tr>
<th>Kind of activity</th>
<th>Man (HOK/\text{year})</th>
<th>Proportion of man activities %</th>
<th>Woman (HOK/\text{year})</th>
<th>Proportion of women activities %</th>
<th>Total (HOK/\text{year})</th>
<th>Proportion of total activities %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cutting forages</td>
<td>106.46±24.94</td>
<td>49.54</td>
<td>28.52±12.23</td>
<td>64.98</td>
<td>134.98±30.84</td>
<td>52.16</td>
</tr>
<tr>
<td>Cleaning animal</td>
<td>6.35±6.60</td>
<td>2.96</td>
<td>4.22±3.53</td>
<td>9.62</td>
<td>10.57±8.74</td>
<td>4.08</td>
</tr>
<tr>
<td>Housing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washing the</td>
<td>1.88±2.91</td>
<td>0.87</td>
<td>1.09±3.63</td>
<td>2.48</td>
<td>2.97±4.17</td>
<td>1.15</td>
</tr>
<tr>
<td>Animal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Giving to drink</td>
<td>4.94±2.67</td>
<td>2.30</td>
<td>0.28±0.99</td>
<td>0.87</td>
<td>5.22±2.68</td>
<td>2.06</td>
</tr>
<tr>
<td>Milking</td>
<td>13.69±9.66</td>
<td>6.37</td>
<td>2.28±5.92</td>
<td>5.19</td>
<td>15.97±10.41</td>
<td>6.17</td>
</tr>
<tr>
<td>Washing the</td>
<td>3.65±2.73</td>
<td>1.70</td>
<td>1.32±3.43</td>
<td>3.01</td>
<td>4.97±3.43</td>
<td>1.92</td>
</tr>
<tr>
<td>equipments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selling milk</td>
<td>5.07±7.01</td>
<td>2.36</td>
<td>1.52±2.56</td>
<td>3.46</td>
<td>6.59±6.98</td>
<td>2.55</td>
</tr>
<tr>
<td>Planting crop for</td>
<td>34.22±11.61</td>
<td>15.92</td>
<td>0</td>
<td>0</td>
<td>34.22±11.61</td>
<td>13.22</td>
</tr>
<tr>
<td>Feeding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Processing manure</td>
<td>0.75±2.85</td>
<td>0.35</td>
<td>0</td>
<td>0</td>
<td>0.75±2.85</td>
<td>0.29</td>
</tr>
<tr>
<td>Training/extension</td>
<td>2.50±0.00</td>
<td>1.16</td>
<td>0</td>
<td>0</td>
<td>2.50±0.00</td>
<td>0.97</td>
</tr>
<tr>
<td>Total</td>
<td>214.91</td>
<td>100.00</td>
<td>43.89</td>
<td>100.00</td>
<td>258.80</td>
<td>100.00</td>
</tr>
</tbody>
</table>

\( ^1\) Man working days  
\( ^2\) Sum of man working days (man and woman)

Table 1 and Table 2 show that the total number of family labor allocation for agricultural activities (goat and salak farming) was 474.19 HOK/\text{year}. The contribution of family labor allocation for goat farming to agricultural farming activities was 54.58%. It means that more than half of family labor allocation for agricultural farming activities was expended for goat farming activities. Setyawan (2001) calculated that the income contribution of dairy goat farming activities to the total income of agricultural farming activities (dairy goat farming and salak farming) was 56.46%.

Table 2. The average of family labor allocation for salak farming

<table>
<thead>
<tr>
<th>Kind of activity</th>
<th>Man (HOK/\text{year})</th>
<th>Proportion of man activities %</th>
<th>Woman (HOK/\text{year})</th>
<th>Proportion of women activities %</th>
<th>Total (HOK/\text{year})</th>
<th>Proportion of total activities %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land cultivating</td>
<td>48.13±16.83</td>
<td>30.32</td>
<td>0</td>
<td>0</td>
<td>48.13±16.83</td>
<td>22.35</td>
</tr>
<tr>
<td>Planting</td>
<td>35.63±5.72</td>
<td>22.44</td>
<td>0</td>
<td>0</td>
<td>35.63±5.72</td>
<td>16.54</td>
</tr>
<tr>
<td>Fertilizing</td>
<td>3.02±0.44</td>
<td>2.08</td>
<td>0.28±0.80</td>
<td>0.46</td>
<td>3.30±0.88</td>
<td>1.40</td>
</tr>
<tr>
<td>Weeding</td>
<td>1.10±0.42</td>
<td>0.69</td>
<td>0.32±0.55</td>
<td>0.56</td>
<td>1.42±0.41</td>
<td>0.66</td>
</tr>
<tr>
<td>Pollinating</td>
<td>56.25±9.00</td>
<td>35.43</td>
<td>0</td>
<td>0</td>
<td>56.25±9.00</td>
<td>26.12</td>
</tr>
<tr>
<td>Harvesting</td>
<td>13.14±24.20</td>
<td>8.27</td>
<td>27.97±16.00</td>
<td>76.05</td>
<td>51.10±14.41</td>
<td>22.72</td>
</tr>
<tr>
<td>Selling</td>
<td>0.90±0.75</td>
<td>0.57</td>
<td>18.08±12.11</td>
<td>31.01</td>
<td>18.98±11.17</td>
<td>8.81</td>
</tr>
<tr>
<td>Total</td>
<td>158.76</td>
<td>100.00</td>
<td>50.63</td>
<td>100.00</td>
<td>209.39</td>
<td>100.00</td>
</tr>
</tbody>
</table>

\( ^1\) Man working days  
\( ^2\) Sum of man working days (man and woman)

The average of farmer’s age of 45 years old was still categorized in productive age with the range of 29-56 years old. Number of animal ownership and land ownership were 1.33 AU and 0.46 ha, respectively (Table 3). Most of farmers had already passed their junior high school. Length experiences in goat farming and in salak farming were more than 10 years and it was relatively long. The number of man in family membership was more than woman with the average of ratio between man and woman was 1.50:1.37 (Table 2). Actually, the total average number of family labor availability was 540.38 HOK/\text{year}. But, in reality, the member of family labor with the age of 10-14 years old were not involved in agricultural farming activities either in goat farming or in salak farming. The total number of family labor availability for this group (10-14 years old) was 48.38 HOK/\text{year}. So that, in this study, the number of family labor availability was only 492 HOK/\text{year} (Table 3). If we compared with the total number of family labor allocation for agricultural farming activities (474.19 HOK/\text{year}), it could be described that the farmers (73.33%
work only on farm and only 26.67% work on farm and off farm) did not allocated their family labor optimally yet.

Table 3. The average of farmer’s characteristics

<table>
<thead>
<tr>
<th>Farmers characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>45.00</td>
</tr>
<tr>
<td>Number of animal ownership (AU)</td>
<td>1.33</td>
</tr>
<tr>
<td>Length experience in dairy goat farming (years)</td>
<td>15.07</td>
</tr>
<tr>
<td>Length of formal education (years)</td>
<td>9.00</td>
</tr>
<tr>
<td>Length experience in salak farming (years)</td>
<td>26.20</td>
</tr>
<tr>
<td>Land ownership (ha)</td>
<td>0.46</td>
</tr>
<tr>
<td>Number of family labor availability (HOK/year)</td>
<td>492.00(^1)</td>
</tr>
<tr>
<td>Ratio between man and woman</td>
<td>1.50 : 1.37</td>
</tr>
</tbody>
</table>

\(^1\)In reality, children with age of 10-14 were not involved in farming activities
\(^2\)Animal Unit

Table 4. The influence of independent variables (farmer’s characteristics) on dependent variable (contribution of family labor allocation for dairy goat farming activities)

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>(\beta)</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>The age of farmer (X1)</td>
<td>0.266**</td>
<td>0.082</td>
</tr>
<tr>
<td>The number of animal ownership (X2)</td>
<td>7.425***</td>
<td>0.004</td>
</tr>
<tr>
<td>Constant</td>
<td>31.782***</td>
<td>0.000</td>
</tr>
</tbody>
</table>

\(R^2=0.320; F=6.351 (P<0.01); ^*P<0.10; ^**P<0.01\)

Table 4 showed that farmer’s characteristics influencing the contribution of family labor allocation for dairy goat farming to agricultural farming activities were age of farmer (\(P<0.10\)) and number of animal ownership (\(P<0.01\)). Model for prediction as follow:

\[ Y = 31.782 + 0.266 \times X1 + 7.425 \times X2 \]

Where \(Y\) : contribution of family labor allocation for dairy goat farming (%)
\(X1\) : age of farmer (years)
\(X2\) : number of animal ownership (AU)

The older of the farmer, the more the contribution of family labor allocation for dairy goat farming to agricultural farming activities. One year older of the farmer’s age could increase 0.266 times of the contribution of family labor allocation in dairy goat farming activities. The greater number of animal ownership, the more contribution of family labor allocation for dairy goat farming activities. Increased in ownership of animal unit higher could increase 7.425 times of the contribution of family labor allocation for dairy goat farming activities.

CONCLUSION

The conclusions of the study were that (1) the allocation of family labor for dairy goat farming was greater than for crop farming, (2) more than 50% of family labor allocation for agricultural farming activities was contributed for the dairy goat farming activities, and (3) the older of the farmers and the greater of animal ownership, the contribution of family labor allocation for dairy goat farming activities also increased.

REFERENCES


QUESTION-ANSWER

Q : Based on number man days in keeping goat in family, how many animals can be kept, can it be measured

A : Average animal ownership is 1.3 animal unit/household. We suggest to generate additional income by creating more activity such as processing milk in goat farming rather than increasing number of animal ownership