Time allocation of family labor in beef cattle farming based on gender

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Abstract. This research aimed to calculate time allocation of family labor on cattle farming based on gender, and to analyze some factors influencing the time allocation for beef cattle farming. The research was conducted in Jepara, Indonesia. The research respondents were 71 beef cattle farmers selected by purposive sampling. Data were analyzed descriptively and multiple linear regression analysis. The contribution of women to the allocation of work time was 25.11% and 74.89% for men. The ratio of the time allocation of the female family workforce to that of male family workforce on beef farming was influenced by all independent variables simultaneously with R² of 0.407. Partially independent variables having positive effect significantly on the dependent variable were the proportion of women productive age and the proportion of men who work outside farming (P≤0.01). The independent variables having negative effect significantly on the dependent variable were the proportion of education for women who have completed 12-year basic education; the proportion of women who work outside farming (P≤0.01), and the number of children under five years old (P≤0.10). It can be concluded that the small-scale beef cattle farming in the rural, the male family workforce was more dominant than the female family workforce.

1. Introduction
Indonesia as a developing country has its population partly in rural area. Those who live in rural areas are mostly work as a farmer or livestock farmer. As for livestock farming, beef cattle are the main choice for farmers in the rural area. In addition, it is often rooted on small-scale business and is traditionally managed. Despite of the small scale, it is still reliable as an addition income for the family. According to [1], a small scale livestock farming or smallholder farmer is highly potential to improve the well-being of the farmer since 99% of beef cattle are coming from smallholder farmers. These farmer acts not only as the worker but also the manager in running their farm. As the worker, both men and women are directly involved in managing the farm. The role of farmers in beef cattle is a time contribution. This is closely related to the role of labor in household farmer.

Gender refers to attributes, social opportunity, and relationship that relate to men and women. Attributes, opportunity, and relationships are built and studied socially through a socialization process. Gender refers to attributes, hopes and social norms, behavior, and culture relate to become a woman or a man [2]. The terms gender is often interpreted as sex although both are two different things. Sex refers to physical condition of someone that distinguishes them as man or woman. When someone born as a man or a woman, there are different norms and culture that follows. The differences of treatment between man and woman are then form roles, behavior, and attributes that are socially
constructed and often called as gender. These differences of treatment, norms, and views affect in many aspects of life. Gender discrimination caused by different achievement between men and women are often associated as gender inequality. In various regions in the world, such as Indonesia, this gender inequality is strengthened by patriarchal culture that prioritizes men over women. Patriarchal culture places men as an entity being in charge of public roles, while women are dwell only on domestic roles.

Men and women have a different gender role. This different gender role also affects their role inside a family. In a household farming, the member of the family is the main worker where the male family members (husband and son) and female family members (wife and daughter) are involved together [3]. A beef cattle farming is a productive activity that involved men and women in various roles. The World Food and Agriculture Organization (FAO) estimates that an equally access to men and women resources will increase agricultural production in developing countries by two and a half to four percent [4].

The definition of gender mainstreaming and gender equality according to Presidential Instruction Republic of Indonesia No. 9 Year 2000 is an equal condition for men and women to access opportunities and rights as human to take roles and participations in political, economic, social, cultural, defense, and security, as well as equality in taking benefits of development. This definition also supported by Law No. 17 year 2007 concerning National Long-Term Development Plans for 2005-2025. The Law stipulated that the national development vision is to create Indonesia that is self-reliant, advanced, just, and prosperous. Just means there is no limitation or discrimination in any form including gender discrimination. But in fact, gender equality has not achieved yet in Indonesian development. There is a gender bias in livestock production [5]. Women tend to have fewer opportunities in participating training. While in fact, the contribution of production or farming towards family welfare and income can be influenced by gender inequality [6]. Gender inequality in a family has a positive influence towards the level of poverty on the family [7]. To create a sustainable farming development, understanding gender mainstreaming and gender equality is a must [8]. Generally, a livestock production offer more profit from other agricultural activities that has been used as an entry point to promote gender equality [6].

2. Materials and methods

2.1. Materials and methods

The research was conducted in the Bucu Village, Kembang Sub-district, Jepara Regency, Indonesia. The research was carried out on April to June 2019. The research methods were survey and direct interview using questionnaire that were prepared before the interview. Seventy-one beef cattle farmers were chosen as respondents. The respondents were gathered by purposive sampling with criteria beef cattle breeders who employed their families both male and female. The research site determination was carried out purposively in Bucu Village. Bucu Village was built as the center for beef cattle farming by the government of Jepara Regency. Jepara Regency was selected as the research site as it is one of 35 regencies in the Central Java Province that owns beef cattle population almost the same with the average of beef cattle population in each regency in the Central Java Province.

2.2. Data analysis

The collected data including respondent’s identity, general information of the farmer’s family who also raised the beef cattle (age, education, occupation, the number of family members who works in the farming business) and the characteristic of the family member (gender, age, education, and occupation). The other variables related to the research topic, i.e. time allocation was measured based on some activities [9] for farmers to do beef cattle farming. To identify the factors that influence the family’s time work allocation according to gender in the beef cattle farming, the statistical analysis multiple linear regression analysis [10] was applied with the formula:
\[ Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + b_{11}X_{11} + e \]

\( Y \) = the ratio of the time allocation of the female family workforce to that of male family workforce
\( X_1 \) = the proportion of productive men’s age in the productive family workforce
\( X_2 \) = the proportion of productive women’s age in the productive family workforce
\( X_3 \) = the proportion of men who have completed 12-year basic education in the family workforce
\( X_4 \) = the proportion of women who have completed 12-year basic education in the family workforce
\( X_5 \) = the proportion of men who work outside the agricultural business in the family workforce
\( X_6 \) = the proportion of women who work outside the agricultural business in the family workforce
\( X_7 \) = the number of income sources
\( X_8 \) = the number of beef cattle raised (head)
\( X_9 \) = the area of agricultural land that is controlled (m²)
\( X_{10} \) = the number of children under five years old (person)
\( X_{11} \) = the proportion of the number of women who participate in the total family workforce who participate
\( E \) = error

3. Results and discussion

3.1. Time contribution of family workforce on beef cattle farming

The number of male workers was 103 men. Among them, only 74 male workers agreed to participate in the beef cattle farming. The results of time contribution of family workforce on beef cattle farming are shown in Table 1.

| Time Contribution                  | %   |
|-----------------------------------|-----|
| Contribution:                     |     |
| Male                              | 74.89 |
| Female                            | 25.11 |
| Participation:                    |     |
| Male(a)                           | 71.84 |
| Female(b)                         | 81.61 |

(a) 74 persons to 103 persons
(b) 71 persons to 87 persons

From these conditions, we got male worker participation rates as = (74/103) X 100% = 71.84 %, with the number of female workers within the family was 87 women. Among them, 71 female workers agreed to participate in the beef cattle farming. The female worker participation rates were = (71/87) X 100% = 81.61 %. From the participation rates, the female worker participation rate is bigger than that of male worker. It was because the number of female workers was less than male workers. But if we look at women participation ratio towards men, we got the ratio as 71/74 or 95.94 %. Female contribution to beef cattle farming was as much as: 25.11 %, while male contribution was 74.89 %. In terms of education background, 12 women or 14.08 % were known to take 12 years of basic education, while 13 men or 12.95 % took 12 years of basic education. The ratio of women who took 12 years of basic education to the men with 12 years basic education background is 12/13 = 92.31 %. From above parameters, we can understand that in the beef cattle farming, the male workers were dominant over female workers. In Indonesia where the majority embraces the patriarchal culture, men have dominant figure in the family including in looking for income for the family. This condition causes women to prioritize domestic works. In production activities, women tend to only help the men. The condition applies to small beef cattle farming in villages. Women contribution is less than the men.
in terms of time contribution on beef cattle farming. This is because in social construction, physical condition and domestic roles of women are considered.

The activities of male and female family workers are shown in Figure 1. Figure 1 shows that almost all of the activities of female family workers tend to only help the man. And some activities had done only by the man.

![Figure 1. The family labor activities in cattle farming](image)

### 3.2 Analysis of multiple linear regressions

To identify the factors considered to influence the allocation of time spent in small-scale beef cattle farming, multiple linear regression analysis was used. The results of multiple linear regression analysis are shown in Table 2.

Table 2 shows that, together, the independent variables that are thought to influence the dependent variable had a very significant effect ($P \leq 0.01$) with $R^2 = 40.7\%$. The proportion of productive women has a positive influence ($P \leq 0.01$). It means that the more the age of productive women in the family, the greater the ratio of time spent by women to the outpouring of men's time.

The proportion of education for women who have undergone a 12 years basic education has a negative and very significant effect ($P \leq 0.01$) means that the greater the woman who attends 12 years of basic education the smaller the amount of time a woman spends or the higher educated women the smaller the time spent on beef cattle because they will work in other fields that do not require much physical strength and will likely give higher income.

The proportion of men working outside farming has a positive and very significant effect ($P \leq 0.01$), which means that the more male workforce in the family works outside the farm, the bigger contribution of women in raising beef cattle because the male in the family spent a lot to work outside of farming.

The proportion of women working outside the farm has a negative and very significant effect ($P \leq 0.01$), or the more female workforce works outside of farming, the less time is spent on beef cattle, because kind of jobs outside farming generally need more time allocation to do their activities although they do not need hard physical activities.
The number of children under five years old has a negative and significant effect (P≤ 0.10), which means that the more children under five in the family, the time spent by women in beef cattle is less as raising of children under five years old related to the domestic role of women.

Table 2. The results of multiple linear regression analysis

| Independent Variable | Koef. | Sig  |
|----------------------|-------|------|
| (Constant)           | -.665 | .178 |
| The proportion of productive men’s age in the productive family workforce | .002 | .344 |
| The proportion of productive women’s age in the productive family workforce | .008 | .003*** |
| The proportion of men who have completed 12-year basic education in the family workforce | .003 | .317 |
| The proportion of women who have completed 12-year basic education in the family workforce | -.009 | .003*** |
| The proportion of men who work outside the agricultural business in the family workforce | .003 | .005*** |
| The proportion of women who work outside the agricultural business in the family workforce | -.006 | .001*** |
| The number of income sources | -.016 | .750 |
| The number of beef cattle raised | .022 | .655 |
| The area of agricultural land that is controlled | -.012 | .933 |
| The number of children under five years old | -.277 | .072* |
| The proportion of the number of women who participate in the total family workforce who participate | 1.417 | .109 |

R² = 0.407
F calculate = 3.684***

Note:
* (P<0.1)
*** (P<0.01)

4. Conclusion
On the small-scale beef cattle farming in the rural, the male family workers were more dominant than the female family workers. In the social construction, the physical condition and domestic role of the women still become a consideration for their participation in the small-scale beef cattle farming.

References
[1] World Bank 2012 Gender Equality and Development
[2] Salman 2017 Dinamika Masyarakat Tani Inminawa Makasar
[3] Ratmayani, Rahmadanih and Darmawan S 2018 J. Sos. Ekon. Pertan. 4 p 65–74
[4] Paudel L N, Meulen U T, Wollny C, Dahal H, and Gauly M 2009 J. Livest. Res. Rural Dev. 3 pp 1–9
[5] Assan N 2014 J. Anim. Sci. 3 p. 125–138
[6] Septiadi M and Wigna W 2013 J. Sodality 2 p. 100–111
[7] FAO and World Bank 2009 Gender In Agricultural Sourcebook (Washington DC: The World Bank)
[8] Greene W H 2012 Econometric Analysis 7th ed. New York: Macmillan Publishing