Factors Determining the Farmer’s Decision to Develop Their Beef Cattle Farming in The Southern Coastal Areas of Central Java

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Abstract. Rural food security is one effort made to increase the availability of animal production. The development of Kebumen Ongole Cross (also known as PO Kebumen) beef cattle is considered necessary to increase the population of beef cattle in the southern coastal areas of Central Java, especially in Kebumen Regency. The purpose of this research is to identify the farmers needs to develop their beef cattle farming and analyze the factors influencing their decision to develop PO Kebumen beef cattle farming. This research employed a survey method to 100 farmers of PO Kebumen beef cattle randomly selected through questionnaires. The descriptive statistic analysis was conducted to describe the farmers’ need to develop the PO Kebumen beef cattle farming. Discriminant analysis was used to identify the main factors determining the farmers’ decision whether or not to develop their Kebumen Ongole Coss beef cattle farming. The research results showed that 93 percent respondents decided to develop their beef cattle farming, while the other 7 percent respondents did not and felt adequately satisfied with their cattle number. The cattle number and their experience in beef cattle farming are the farmers’ important factors to considerably make their decision whether or not to develop their beef cattle farming. The increasing farming experience and number of cattle tend to drive the farmers develop their cattle farming. The development of PO Kebumen beef cattle farming should well consider the farmers’ maximum capacity as it is not their main business.

1. Introduction
The development of increasingly massive and intensive rural area may well be the main driver of Indonesia's 5.02 percent economic growth in 2016 [1]. Its economic activity developed relatively fast with the development of economic centers of agriculture, animal husbandry and plantation in rural area. Kebumen as one of regency in the southern coastal areas of Central Java Province take more efforts in developing agriculture sector to meet the food security target. The business of cattle farming in Kebumen Regency serves as a contribution of animal husbandry for rural economy development. PO Kebumen cattle is a commodity developed for rural economic development, specifically in the southern coastal region of Kebumen Regency.

PO Kebumen cattle is one of the local livestock genetic resources in Indonesia that plays a great part in rural economic development and in increasing national meat production. Based on Decree of Minister of Agriculture Republic of Indonesia No. 358/Kpts/PK.040/6/2015, PO Kebumen cattle develops the local cattle of superior productivity. Their products are popular among the local community therefore breeding is needed. PO Kebumen cattle farming in Kebumen Regency is a community-based farming involving 29 cattle farmers groups. It is expected that increasing the number of cattle and cattle production of PO Kebumen is expected to meet increase in beef consumption in 2017. The 2017 statistical data of Animal Husbandry and Health shows an increase in meat consumption by 5.69 percent compared to that of 2016. In addition, expenditure on meat consumption also increased by 0.08 percent in 2016.

The business development of PO Kebumen cattle farming has turned into great strategic in relation to the dynamics of meat consumption and the increasing household food expenditure. The business
development of PO Kebumen cattle can be interpreted as an endeavor to intensify the business scale of PO Kebumen of every farmer. The development of an increasingly supporting external environment may act as a driving force and motivate the farmers to develop their cattle business. Increasing the scale of business may have an impact on cattle farming efficiency and competitiveness. PO Kebumen cattle farmers act as business managers and authorize to make decisions on business development based on various factors. Fahad et al. [4] illustrated that various factors may affect the decision making which include capital, motivation, perception, learning (experience), interests, education, ability to take risks, access to credit, education, and age. The decision to develop PO Kebumen cattle farming is very strategic in increasing the competitiveness of PO Kebumen cattle business. Characteristics of farmers such as the number of family member, age, farming experience, and the number of livestock owned may be the determining factors in making decision in developing beef cattle farming. In light of this, the study aims to identify the needs of cattle business development and analyze factors that influence the decision making in developing PO Kebumen cattle farming.

2. Materials and Method
This study employed a survey method using questionnaires and interview with 100 respondents i.e. farmers of PO Kebumen cattle. These respondents were selected using a multistage sampling method. The first stage was sampling taken from the sub-district area and carried out using a purposive method on six selected sub-districts (Puring, Petanahan, Klirong, Mirit, Bulus Pesantren, and Ambal). These six sub-districts were the development center of PO Kebumen cattle. On the second stage of data collection, we selected 29 farmers groups and it was carried out using randomly with a total of 20 percent of the whole farmers groups. In the third stage, 100 farmer respondents were selected randomly i.e. 20 percent in each selected farmers group.

This study used descriptive statistical analysis to describe the orientation development of PO Kebumen cattle breeding business. Sugiyono [14] stated that descriptive statistics is to describe or provide an overview of an objects studied through a data sample or population as is, without conducting analysis and produce generally accepted conclusions. Whereas discriminant analysis is used to identify and analyze factors that influenced the farmers in making their business decision. Mahotra [12] explained that discriminant analysis is a technique to analyze data when the dependent variable is categorical and predictors or when the independent variables are of interval.

3. Result and Discussion
3.1 Respondent Profile
Farmers of PO Kebumen cattle started to pick up more intensive and commercial business activities in 2010 even though the group was just established in 2014. The farmers had experience more than 5 years in raising cattle. However, the number of their livestock has never been significantly increased. On average, each farmer of PO Kebumen cattle only owned 2 animal units (AU). In general, each farmers PO Kebumen had family members of less than or equal of four.

| Variable               | Percentage |
|------------------------|------------|
| Age                    |            |
| Productive (15 – 64 yo)| 97         |
| Non-productive (>64 yo)| 3          |
| Formal Education       |            |
| Elementary             | 57         |
| Junior and Senior HS   | 35         |
| Higher Education       | 8          |
Most of these farmers (97 percent) were in their productive age group, characterized with highly motivated, dynamic, innovative and eager to develop further. These characteristics become very important when associated with their efforts to develop the business scale cattle. Huber et al [9] stated that young farmers tend to be more motivated to increase the growth of their business. Likewise the experience of farming provides the farmers the adequate skills and knowledge, and access to sources of market information. Farmers’ long involvement in cattle business has given them the confidence to innovate and motivation to develop their business. Khayapi and Celliers [10] stated that limitation in access to market information, livestock technical skills, and business management experience may inhibit farmers’ efforts in developing their businesses.

Our farmers had a simple family structure with maximum four family members. Such simple composition is sufficient to sustain a family business with a scale of 2 animal units. However, the cattle business development of greater scale would be more effective with an increase in the number of workers. Higher number of family member could be a great potential in preparing for the business development. Garcia-Arias et al (2015) stated that a dynamic agricultural business activity is characterized by the involvement of greater number of family member.

### 3.2 Motivation for Farming/Business Development

The development of PO Kebumen cattle business has become the goal of livestock development in Kebumen District within a large framework of rural economic empowerment and food security. The business development is identified with the addition of business scale or the number of cows in a household. At the time, cattle farmers only maintained to have two cattle for a number of reasons. Based on our observations and interview with the respondents, we found that only 93 percent farmers wanted to develop their businesses i.e. increasing the number of cattle. Table 2 illustrates that most farmers (69 percent) felt that the number of the livestock owned has not yet fulfilled family needs. Furthermore, limitation of farmers’ cattle business-scale failed to provide farmers improvement in their social status. Handayanta et al (2016) stated that the financial feasibility of cattle farming was achieved if a farmer has six heads of cattle. As such, farmers of PO Kebumen cattle having 2 animal units have not been able to provide a change and an increase in their social status. The same notion is in line with Krisna's research (2014) in that maintaining a minimum of four cattle may contribute to farmers living appropriately.

The motivation to develop PO Kebumen cattle business was based on the motivation to utilize farmers’ idle time. Three percent of our respondents felt that owning only 2 animal units left them some time and they felt that time could be optimized with an increase in business scale. Improvement in family social security net motivated the orientation of adding business scale as suggested by the respondents. About 37 percent respondents said that increasing business scaled would contribute to family saving. Farmers’ family/spouse played a strategic role in encouraging the increasing family savings to prepare for future risks and urgent needs. Their spouses inserted their views to expand the business scale with the goal to prepare for future risks. This is in line with Hansson's study (2013) that farmer’s family influenced farmer’s decision to do so.

| Farming experience |   |
|--------------------|---|
| < 5 yr             | 2 |
| ≥ 5 yr             | 98|

| Number of cattle   |   |
|--------------------|---|
| < 4 ST             | 98|
| ≥ 4 ST             | 2 |

| Number of family member |   |
|-------------------------|---|
| ≤ 4 ppl                 | 97|
| >4 ppl                  | 3 |
in developing and diversifying the businesses. Business development was taken to decrease business risk and idle resources, as well as lifestyle/social status improvement. However, the most response stated by PO Kebumen cattle farmers (59 percent) was that the main motivation to expand the business was the need to increase family income.

Expanding the business scale was also motivated to improve business efficiency and business contribution to family income, based on the farmers’ idle time. Farmers had other non-cattle business activities and they also had other various kinds of economic businesses. Their idle time triggered the idea and consideration to develop PO Kebumen cattle business. Sugiarto et al. (2017) stated that PO Kebumen cattle maintenance required 1.02 hours per Animal Unit, thus increasing the business scale will lead to an increased time needed for maintenance.

Table 2. Farmers’ perception regarding business development

| Variable                        | Percentage |
|---------------------------------|------------|
| Adequacy of business scale      |            |
| Insufficient                    | 69         |
| Sufficient                      | 31         |
| Availability of business time   |            |
| Insufficient                    | 2          |
| Sufficient                      | 98         |
| Business development needs      |            |
| Not developing a business       | 7          |
| Developing a business           | 93         |
| Reasons for developing a business |          |
| Idle time                       | 3          |
| Availability of pastures        | 1          |
| Increasing savings/investment   | 37         |
| Increasing income               | 59         |

3.3 Factors Influencing Farming/Business Development

The perception of PO Kebumen cattle farmers on the insufficiency of business scale was also shown by their decision to develop their cattle business. Table 2 shows that 91 percent of the farmers made the decision to develop their business with the concept of adding business scale. Farmers as business managers have the authority to make decisions regarding the development and growth of their business. The performance of farmers as livestock business managers can be observed by the expansion of business scale and their business profit. O’Leary et al. (2017) stated that the ability farm manager in formulating business objectives and business development ideas was an important factor in driving business profitability. This demonstrates that the ability and courage to make decisions for business development is an important factor in the sustainability of PO Kebumen cattle business.

This study discusses further on the number of family members, the number of livestock owned by the farmers, farmer’s age, and the experience of raising cattle in relation to the decisions to develop cattle business. Based on the result of discriminant analysis, 93 percent of the respondents chose to develop their businesses while the other seven percent chose not to develop their businesses and felt that the business was sufficient with the current livestock.
Average difference between groups

The data is divided into two groups i.e. farmers who made decisions to increase the number of their livestock and farmers who decided not to increase the number of their livestock. Based on the Wilks lambda testing, Table 3 shows the significance value is less than alpha (0.05) (P <0.05), thus it is concluded that there are differences between the two groups with the assumption that the average differences between the groups are met.

Table 3. Wilks’ Lambda

| Test of Function(s) | Wilks’ Lambda | Chi-square | df | Sig. |
|---------------------|---------------|------------|----|------|
| 1                   | .861          | 14.515     | 2  | .001 |

The above explains that there is a significant difference (P <0.01) between the two groups with regards to business development decision making with the discriminant model.

Table 4 Equality Test of Group Means

|                     | Wilks’ Lambda | F    | df1 | Sig. |
|---------------------|---------------|------|-----|------|
| Farmers Education   | .998          | .229 | 1   | .633 |
| Farm Size           | .928          | 7.550| 1   | .007 |
| Family Members      | .985          | 1.482| 1   | .226 |
| Farming Experience  | .942          | 6.044| 1   | .016 |

Based on Table 4 (equivalence test of average group), there are two variables that significantly differentiated the two groups as the significance value is less than 0.05. The two variables are the current farm size (P, 0.01) and the experience of raising cattle (P <0.05).

Table 5. Canonical Discriminant Function Coefficients

|                     | Function |
|---------------------|----------|
| Farm Size           | .973     |
| Farming experience  | .061     |
| (Constant)          | -.110    |

Based on Table 5, the result of discriminant function/model shows that the decision to develop the business of PO Kebumen cattle can be explained by changes in the number of livestock owned and the experience of raising beef cattle. The result of discriminant model can be described as Z score = -2.110 + 0.973 number of livestock + 0.061 experience in farming. This function is used to analyze respondents’ tendency to be included in a group that would either develop a business or not wish to develop business of PO Kebumen cattle.

The experience in raising livestock has a positive relationship towards farmers’ decisions to increase the number of livestock they had. Farmers as livestock business managers had a lot of information in deciding to increase the number of their livestock. Their knowledge became an important factor in determining the success and sustainability of livestock business. Knowledge and skills that continued to grow could encourage these farmers to have the ability to anticipate changes in the changing business environment. Having more experience could encourage the breeders to make decision to expand their farm. Increasing the number of cattle would lead to increased problems and challenges faced by the farmers on both economic and technical issues. Therefore, experience in raising livestock is a factor considered in
formulating the development decisions of PO Kebumen cattle business. Farmers who are more experienced and involved in cattle business will be better prepared to deal with changes in the changes occurred as a consequence of expanding the business scale. Nitisemito and Burhan (2004) stated that work experience is an indicator of improvement in human knowledge and may influence the ability to execute work. Work experience can be known from the amount of time a person involved in a business or work.

The number of livestock has a positive relationship with the decision making of farmers in developing their business. The limited number of livestock owned encouraged the farmers to make decisions to increase the farm size of cattle business. It is reasonable to believe that the increase in the number of livestock has increased farmers’ income. The increase in the number of livestock is also believed to increase the livestock sales, which in turn could increase farmer’s income. The current number of livestock maintained was 2 animal units and left a lot of idle time to be utilized more optimally through the expanding the farm size. Ekowati (2012) stated that a factor that can increase cattle production is the number of female adult cattle and the amount of time spent working with the cattle. With regard to personal dimension, farmer’s interest in developing the businesses and increasing the number of livestock was motivated by the limited number livestock currently owned.

4. Conclusion
Based on our study, it is concluded that most PO Kebumen cattle farmers felt that the current number of livestock (2 Animal Units) was not sufficient to support family welfare. Consequently, PO Kebumen cattle breeder needed to develop their development by expanding their business scale. Further business development was driven by economic motivations, namely increasing family income and savings. The decision of PO Kebumen cattle farmers to develop their business was influenced by the number of cattle currently owned and the experience of raising cattle.

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