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Risk Management in Smallholder Cattle Production in Sekaran Village, Bojonegoro

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ABSTRACT

This study analyzes risks in smallholder cattle production. A household survey was carried out among 109 farmers in a village of Sekaran, one of cattle production center in Bojonegoro, East Java. The monthly average income of farmer household was Rp. 293,877 per capita and it has 2-3 cattles on average. A risk matrix was applied to plot 17 risks related to cattle and farmer households into four quadrants based on the occurrence probability and severity level. Drought, feed scarcity, cattle diseases, and farmer sickness had "high probability and severity level", and therefore were prioritized to be addressed. The logit regression model of feed scarcity, cattle diseases showed that economies of scale significantly reduced risk of feed scarcity but it could increase risk of cattle diseases. Risk of cattle diseases could be reduced significantly by applying more intensive hygiene and treatment. A livestock pattern transformation from individually separated cages under individual farmers into an integrated or colony farm under farmer group is suggested as a risk management strategy in order to achieve economies of scale and effectively control livestock hygiene and treatment.

Keywords**:** Cattle smallholders, Farmer group, Risk management, Risk matrix

Introduction

The beef crisis that often occurs in Indonesia leaves some questions about the availability and needs of national beef. Availability of beef at affordable prices is very needed by the community as end consumers, but on the other hand, the welfare of domestic cattle farmers as suppliers also needs adequate attention. The success to achieve these two interests is greatly influenced by the performance of the supply chain and risk management of domestic cattle both production performance and distribution capability.

Directorate General of Livestock and Animal Health (Directorate General of Livestock and Animal Health, 2017) reported that national meat production reached 531,000 tons where 61% of national beef production was on Java. One of the largest provinces producing beef is East Java with beef production of 103,625 tons. East Java is a buffer zone for national beef cattle.

The population of beef cattle in East Java in the period of 2009-2017 had increased by an average of 26% per year, but in 2013 its growth had fallen by 20% (Central Bureau of Statistics (BPS) of East Java, 2017). This reduction must be anticipated so that the availability of beef can be maintained and prices can be affordable.

The Livestock service of East Java (East Java Livestock Services, 2018) in the price survey in Surabaya and surrounding areas, Malang milk cooperative, Batu and its surroundings and Traditional Markets found an increase in beef prices in East Java on average 2% per month. The increase in prices and the high demand for beef has led to slaughter more animals than the availability (stock) so that there was a decline in cattle population in 2013. This slaughter is also thought to occur in productive females that cause a reduction in population in the future. This is difficult to avoid because cattle farmers in majority are smallholder cattle farmer who sell cows when there is a family economic shock or feel the price of cattle is already high enough. The government has banned the slaughter of productive females but its effectiveness is doubtful. This is because there are no institutions that bail out the needs of smallholder cattle farmer.

Research on the development of beef cattle in Indonesia is directed at increasing population by empowering smallholder farmers (Bamualim *et al*., 2008). the Increasing of beef cattle population is carried out through the development of quality beef cattle breeding businesses (Agriculture department, 2006).

Bojonegoro, where this research was conducted, is one of the cattle producer districts in

East Java that are based on smallholder farmer and breeding business. A large variety and number of obstacles faced by smallholder farmer has encouraged the Bojonegro Regency Government to work with the Bogor Agricultural Institute to develop the School / smallholder livestock center (SPR) as a medium for transferring knowledge, technology and managerial skills to smallholder farmers to improve livestock business practices and improve productivity collectively and professionally (Wiska *et al*., 2016). This study aims to map priority risks that need to be addressed by SPR and to formulate mitigation strategies so that SPR can develop appropriate work programs according to the needs of farmers.

The development of cattle population in Bojonegoro Regency experienced dynamics from year to year. The significant increase in population occurred from 167,624 heads in 2009 to 201,992 heads in 2012 but this number dropped sharply to 160,037 heads in 2013 (Central Bureau of Statistics (BPS) of East Java, 2017). The downward trend that occurred both at the district and provincial levels needs to be further analyzed for the causes. This study aims to analyze the risks which were experienced by farmers in 2013 and 2014 that was potential to encourage the sale of productive female and cause a decline in cattle population.

The objectives of this study are: (1) to identify the characteristics of smallholder farmers and their livestock businesses, (2) to analyze the main risks experienced by farmers that need to be prioritized to be handled, and (3) to analyze the factors that influence farmers' vulnerability to these main risks.

Materials and Methods

Data collection method

This research was conducted in Ngantru Hamlet, Sekaran Village, Kasiman Sub-District, Bojonegoro Regency, East Java. The time of research began from September-October 2014. Data collected in this study included primary data and secondary data. Primary data was obtained from interviews with Ongole cattle farmer. Secondary data was obtained from statistical data held by Bojonegoro Regency Service, articles, literature, previous research and other related information. The method of data collection in this study was conducted with three activities: literature study, interviews, and observation. Sampling to identify supply chains of Ongole beef cattle was carried out by convenience sampling. Based on data from farmers who were recorded by SPR, the number of population of farmers in the study area reached 157 farmers. The amount of sample that was taken reached 109 farmers or 70% of the population, so they represented the profile of smallholder farmers in Sekaran Village as an SPR case study.

Data processing and analysis

Data processing was done using Excel 2010 software, Minitab 16 and IBM SPSS Statistics version 19. The forms of data analysis used are: descriptive analysis, risk analysis, and logit method.

Descriptive analysis. Descriptive analysis is an analytical tool used to describe or analyze a statistical result of research, but not used to make conclusions (Arikunto, 2007). Descriptive analysis functionates to describe the object under study as it is. Descriptive data analysis was conducted to describe the general condition of cattle breeding business and risk aspects that have priority values.

Risk analysis. Supply chain management integrates activity of material procurement and service, converts into semi-finished goods, and end products, and deliveries to customers (Heizer and Render 2010; Anatan and Ellitan, 2008). A number of risks need to be identified and handled along the supply chain of cattle from farmers to consumers. Marimin and Nurul (2010) define supply chain risk as the loss studied in terms of the possibility of occurrence, side of possible causes, and the consequent side in the supply chain of a company and its environment. The risks studied were focused on upstream supply chain person who was farmers. Strategy that could be used such as transferring risk to others, avoiding risks, reducing the adverse effects of risk and accepting some or all of the consequences of certain risks (Marimin *et al*., 2013). Djohanputro (2008) defines risk as uncertainty which has known the probability of occurrence. The process of operational risk management is the process of identifying, measuring risk, and forming strategies to manage it through available resources (Muslich, 2007). Risk identification used the FMEA approach (Failure Mode and Effect Analysis), namely the level of risk probability (Occurrence) and its impact (Severity) (Stamatis, 2003). The risk matrix, as presented in Figure 1, was used to identify and analyze risk events based on the level of opportunity and its impact if the event occurs. The steps to be taken in preparing the risk matrix were: (1) identifying and listing the events that had occurred and that might occur in the future that had the potential to cause losses to farmers, (2) assessing the opportunity or frequency of events on a scale of 1 - 4 where 1 = very rare and 4 = very often, (3) assessing the severity of the impact of an event for farmers on a scale of 1 - 4, where 1 = very low and 4 = very high, (4) mapping these events in the risk matrix.

The matrix divided the risk into four quadrants: (1) quadrant 1 or top priority contained events that often occurred and had large impact on farmers, (2) quadrant 2 contained rare risk events but there was a huge impact on breeder when it happened, (3) quadrant 3 contained risk events that often occurred but had low impact, and (4) quadrant 4 contained risk events that were not dangerous because they were rare and

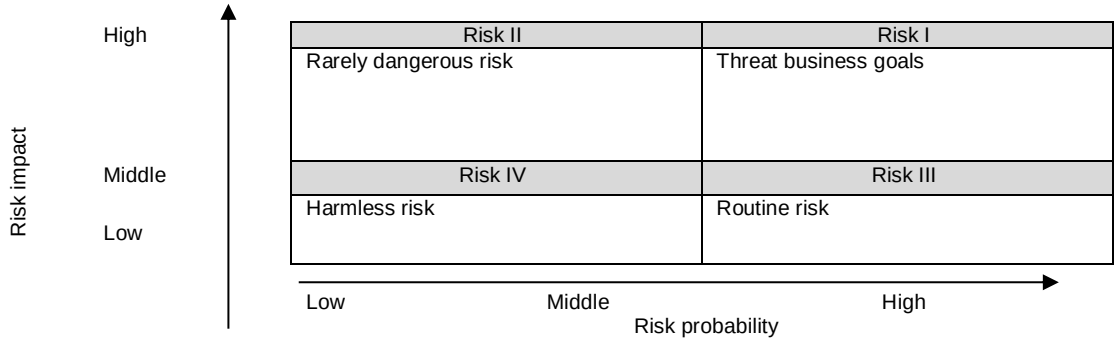

Figure 1. Risk Matrix.

had low impact. Each quadrant would have consequences for different risk mitigation strategies.

Logit method. The logit model is a non-linear regression model that produces an equation where the dependent variable is categorical (Gujarati, 2012). Logit model regression equation is obtained from derivation in the probability equation of the categories to be estimated. A function is stated to be a logit model if the function is a normal distribution function, which can be systematically seen in equation 1.

$Y_i = \beta x_i + u_i$ where $u_i \sim N(0,1)$……..…..(1)

The equation above explained the relationship between coefficients with significant levels obtained from the results of the logit analysis data processing at the real level as follows:

1. *** <0.01 there is very strong evidence to reject the null hypothesis.
2. ** <0.05 there is medium evidence to reject the null hypothesis.
3. * <0.1 there is weak evidence to reject the null hypothesis.

The dependent variables and independent variables used in this study were presented in Table 1. Determination of the variables above was based on several previous studies. The development of beef cattle business was influenced by several factors, including farmer characteristic which included age, education and experience (Soltief, 2009) and efforts to increase knowledge and skills through training (Tomatala, 2008; Wiyatna, 2012). Soltief (2009) explained that farmers aged between 15-55 years had higher chance of success in the implementation of a beef cattle development program. Soekartawi (2005) found that more experienced farmers would more quickly absorb agricultural technology innovations compared to farmers who were not or less experienced.

The risks faced by farmers had been discussed in a number of studies. Panggasa (2008) found that the risk of sick cattle was generally relatively high in lean or under-feed cattles and wild grazing. Another risk was reproductive failure. This risk could be anticipated through artificial insemination (IB) (Murtidjo, 1990; Monintja *et al*., 2015).

Results and Discussion

General conditions of Bojonegoro

The agricultural sector was the leading sector of Bojonegoro Regency after oil and gas. This agricultural sector contributed around 19% of the total GDP of Bojonegoro Regency and absorbed 349,540 workers. Bojonegoro Regency is also known as a center for cattle breeding, especially beef cattle (Bojonegoro Regency Government, 2014). The development of this breeding business needed to pay attention to the benefits or peculiarities of an area, for example in Madura beef cattle were directed to sonok cattle and karapan cattle (Kutsiyah, 2012).

Bojonegoro Regency is dominated by lowland, which is between 25-500 m above sea level (Bojonegoro Regency Government, 2014). Such conditions are suitable for the development of cattle where the technical efficiency of cattle production in the lowlands is better than in the highlands (Kalangi *et al*., 2014).

Characteristics of farmers

Characteristics of farmers in Ngantru Hamlet included an average age 46 years that was an productive age according to the BPS category, with a number of family members was 4 and an average length of cattle farmer was 20 years (Table 2). The majority of farmers were men (91%) with elementary education (84%). Motivation to raise cattle business was to help his agricultural business, environmental culture, economy, hobbies, and a small part because of inheritance.

The majority of farmers (93%) stated that food crops such as rice, corn and green beans were the main sources of income while cattle farmer were only perceived as additional commodities. The majority of cattle farmers (89%) maintained their own livestock while the rest maintained livestock belonging to other people both as workers and in collaboration with gaduh systems.

Table 1. Dependent and independent variables

Variables	Variable name	Measurement Scales
Dependent	Risks of cattle breeding contain feed scarcity, sick cattle, and artificial insemination failure (Y)	Binary
Independent	Farmer's age (X_1)	Ratio
	Education (X_2)	Ordinal
	Farming experience (X_3)	Ratio
	Training length (X_4)	Ratio
	Family income (X_5)	Ratio
	The number of cattle (X_6)	Ratio
	Ratio of female cows (X_7)	Ratio
	Special cage (X_8)	Binary
	cattle inspection (X_9)	Ordinal
	Cattle hygiene and maintenance (X_{10})	Ordinal

Source: Processed data (2015).

Table 2. Farmer Characteristics

Characteristic	Min	Mean	Max	St.dev
Age (year)	25	46	85	13
The number of family member (person)	1	4	7	1n
Farming length (year)	1	20	64	13
Income (IDR)	175,000	1,175,508	7,416,666	1,203,988

Characteristics of livestock business

The type of cattle developed in Sekaran Village was an Ongole Breed. The majority types of livestock business in Ngantru Hamlet, Sekaran Village were dominated by breeding businesses 91%, followed by fattening 8% and trading at 1%. The majority of breeders raised a limited number of cattles, 2-3 heads. Broodstock sales from 2013 to 2014 experienced an increase as presented in Figure 2. This confirmed previous expectations so that adequate incentives were needed to develop the breeding business. The varying reasons of cattle sales were presented in Figure 3. Sales because of entangled in debt had increased in 2014. This showed that the economic pressure on smallholder farmer in 2014 was heavier.

Risk mapping

The risk mapping experienced by smallholder farmers could be identified based on the severity (S) and occurrence (O) level (Figure 4). Risk mapping experienced by farmers described the risks that occurred in cattle supply chain activities. These risks were grouped according to the level of incidence and severity according to the quadrant mapping shown in Table 3 and Figure 4.

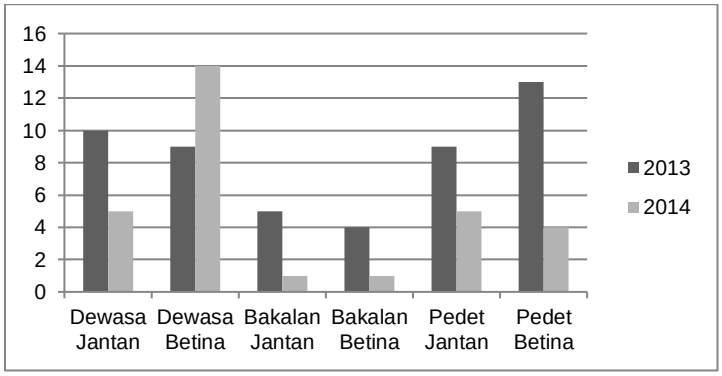

Figure 2. Cattle trading trend 2013-2014.

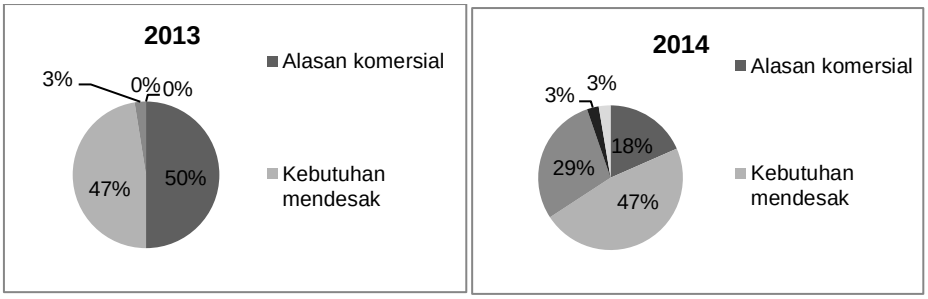

Figure 3. Shifting sales reason.

Quadrant (risk) I has high value of severity and incidence rate. In this case, it consisted of drought, difficulty in obtaining food, sick farmers and sick cattles. The occurrence of droughts had very significant impact on farmers with very high severity and risk opportunity in the past year. This risk was one of the factors in ensuring the availability of feed which had an effect on increasing cattle weight. This quadrant also contained the risk of sick farmers and sick cattles. The majority of farmers had more than one activity to generate income that took time and energy such as farm laborers or oil seekers which caused fatigue and illness. When they were sick, they did not have alternative passive income, so the impact was very high on the family economy. Cattles also often getting sick, especially intestinal worms, which caused decrease in cattle body weight gain even though adequate forage feed was provided. It caused the high opportunity cost of farmers because they had devoted their energy and time to their livestock by sacrificing other alternative economic activities.

Quadrant II contained events with a small opportunity of occurrence but the severity of the impact was high. Risks that were in this quadrant including: dead cattles, price selling mistake, selling price dropped, and accidents that was experienced by farmers/family farmers.

Quadrant III contained events that often happened but had a low impact severity. Failure of artificial insemination was included into this quadrant with occurrence of 0.55 and severity 1.84, which meant the incidence rate was above the average 0.1 but it was still below the average impact line 0.2. Besides this, shopping for traditional ceremonies, such as kenduri (festivities) that was event which often occurred

Table 3. Risk Variables by FMEA Technique

No	Risk Variables	Occurrence	Severity	Type of risk
	Quadrant I			
8	Drought	0.35	2.57	Natural disaster risk
25	Feed scarcity	0.17	2.16	Livestock risk
1	Sick	0.12	2.31	General risk
17	Sick cattle	0.10	2.09	Livestock risk
	Quadrant II			
18	Death cattle	0.03	2.67	Livestock risk
23	Price selling mistake	0.02	2.50	Livestock risk
22	Selling price of cattle dropped	0.03	2.33	Livestock risk
2	Farmer/ family member accident	0.04	2.25	General risk
	Quadrant III			
13	Failure of artificial insemination	0.55	1.84	Livestock risk
4	Shopping for traditional ceremonies	0.28	1.90	General risk
	Quadrant IV			
3	New family birth	0.03	2.00	General risk
5	House damage	0.02	2.00	General risk
27	Increase of loan interest rate	0.01	2.00	Economics risk
26	Lost of a job	0.01	2.00	Economics risk
15	Dwarf cattle	0.01	2.00	Livestock risk
24	Increase of feed price	0.01	1.00	Livestock risk
90	Cheated by others	0.01	1.00	Economics risk

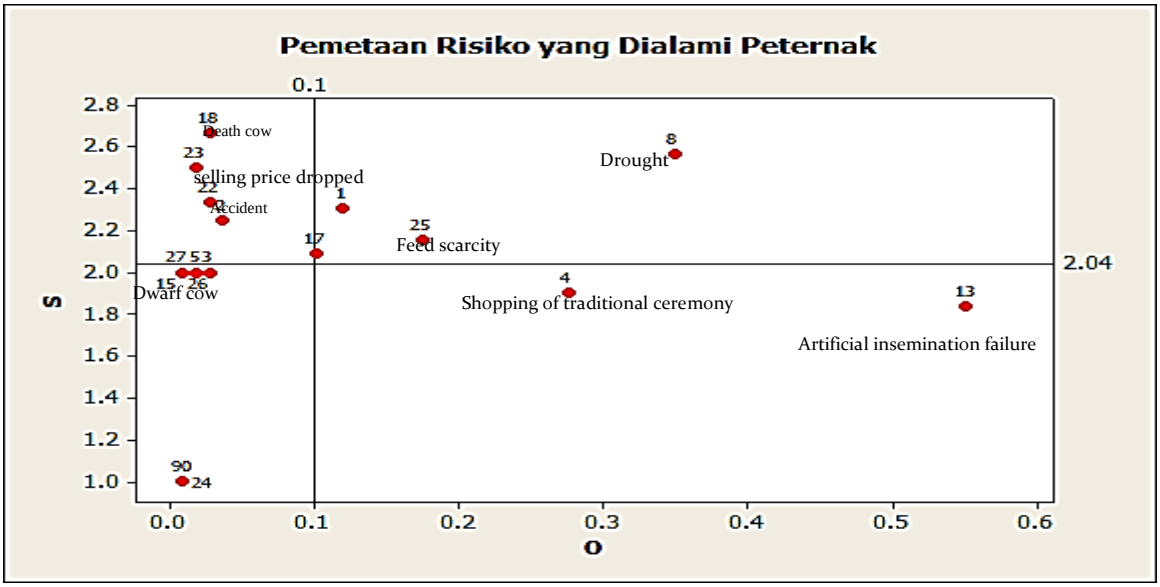

Figure 4. Farmer risk mapping.

but it had a low impact severity with a value of occurrence 0.2 and severity 1.90.

Quadrant IV was a harmless risk with an occurrence and severity level below the average line. This quadrant contained seven risks that was the birth or joining of new family members, damaged homes, increase in loan interest rates, loss of non-agricultural jobs, dwarf cattle/weight did not rise and increase in feed prices and tricked by people. This quadrant had an opportunity value of events below 0.1 and the severity was below 2.04.

Parameters for estimating risk

The factors that influenced these risks were then analyzed, especially the risks that were in Quadrant I and/or directly related to beef cattle breeding business. These risks were feed scarcity, sick cattle, and failure of artificial insemination. Logit analysis was applied by making the experience of the farmer for these risks as the dependent variable and a number of factors consisting of the characteristics of the farmer and the management of livestock business as independent variables.

Feed scarcity

The risk of feed scarcity could be explained by the model presented in Table 4. The test results of the Hosmer and Lemeshow Goodness-of-fit was obtained value 33.909 and a significant probability of 0.000 with real level 10% so that the model could be accepted. The R^2 value of 0.403 indicated that 40% of the diversity risks of feed scarcity could be explained by this model.

Significant variables related to the risk of feed scarcity were farmer's formal education, family income, and number of cattles in the previous year. The model explained that the higher number of cattles could reduce the risk of feed scarcity. The more cattles, the higher anticipation of feed difficulties and having many cattles had better capital or tools. Feed supply would be more efficient if it carried out by using large capacity transportation modes such as pickup or trucks if need of feed and cattle reached certain economic scale. This would be very difficult for farmers who had a small number of livestock because the cost of transporting feed became too high compared to their feed needs. Farmer education, in this case formal education, were very important to reduce this risk. Farmers who have higher level of education generally have better access to information and knowledge about alternative feed diversification. Farmers with higher family income were also easier to overcome risk of feed scarcity because they could allocate enough money to buy or to get feed in the dry season. Several types of feed could be made and stored for the dry season.

Climate factors affected access to look for feed. The capacity to add cattle in an area was influenced by climate, family structure, land use, production management and technology (Lole *et al*., 2013; Lisson *et al*., 2010). Integrated farming systems, for example by utilizing maize, cattle feces could also be used to mitigate feed risks due to climate change (Munandar *et al*., 2015). The problem of land use for agriculture and livestock was not directly related to reduce forest area (Gollnow and Lakes, 2014). Soil degradation also affected land productivity which caused land conversion. Productive land was narrowed and farmers had difficulty in providing feed (Tesfa and Mekuriaw, 2014).

Sick cattle

The risk of sick cattle was estimated using the logit model presented in Table 5. The Hosmer and Lemeshow Goodness-of-fit test results obtained value 6.572 and significant probability 0.083 with real level 10% so that the model was accepted, while the R^2 value was 0.301 indicating that 30% of the risk diversity of sick cattle could be explained in this model.

Significant variables related to the risk of sick cattles were the number of cattles in the previous year and cattle hygiene/maintenance (Table 5). The negative value of coefficient on the number of cattles explained that high economic scale of farmers could increase the risk of cattles being sick. The large number of cattles tended to be faster to spread disease. The hygiene/maintenance coefficient, on the contrary, was positive. This showed that maintaining cattles, for example by being routinely bathed so that hygiene was kept and significantly reduced the risk of cattles being sick. The dirtiness cattle and cow house were often the main source of disease. This was in line with the findings of Sitepoe (2009). Types of disease that were often spreaded to cattle were anthrax or spleen inflammation, while other diseases that often occurred in cattle were foot and mouth disease (Sarwono and Arianto, 2001; Sitepoe, 2009). Prevention of this disease could be done by maintaining hygiene of cow houses, eliminating disease-spreading insects and spraying pesticides (Sarwono and Arianto, 2001; Sitepoe, 2009).

Biosecurity had not received adequate attention because the disease incidence such as Bovine Spongiform Encephalopathy (BSE) and

Table 4. Parameter estimators and significant tests for feed scarcity

Variables	Coefficient	S.E	P-value
Farmer age	-0.025	0.029	0.377
Formal education	-2.062	0.837	0.014*
Farming experience	0.011	0.022	0.610
Family income	-1.393	0.441	0.002**
The number of cattle last year	-0.413	0.206	0.045*
Special cattle cage	-1.559	1.344	0.246
Constants	22.074	6.554	0.001

Table 5. Parameter estimator and significant test for sick cows

Variables	Coefficient	S.E	P-value
Farmer age	-0.045	0.042	0.285
Formal education	1.622	1.297	0.211
The number of cattle last year	0.215	0.122	0.077*
special cattle cage	1.116	1.305	0.392
Length of training	-0.767	1.035	0.458
Cattle inspection	0.760	1.035	0.462
Farming experience	-0.016	0.034	0.637
Cattle hygiene and maintenance	-0.581	0.331	0.079*
Constants	-5.609	5.192	0.280

Foot and Mouth Disease (FMD) was relatively rare. Biosecurity information from government sources had sometimes not been responded positively by farmers so that more neutral sources were needed (Heffernan *et al*., 2008). Anticipation of cattle disease such as FMD was influenced by risk perceptions, producer trust, regulations and moral norms (Delgado *et al*., 2012).

Artificial insemination failure

The risk of artificial insemination failure was estimated by logit model in Table 6. The results of Hosmer and Lemeshow Goodness-of-fit test obtained value 14.587 and significant probability was 0.068 with real level 10% so that the model was accepted, while the R^2 value was 0.118 indicating that 11 % of the failure risk diversity of artificial insemination could be explained in this model.

Significant test results related to failure of artificial insemination had three variables that affected that was the number of cattles in previous year, the ratio of the previous year female cattles, and examination of cattles. The model above explained that the more cattle managed by farmers would reduce the risk of artificial insemination failure. The high ratio of female cattle could increase the chances of artificial insemination failure. Sitepoe (2009) states that success occurred if insemination was done when female cattles were being estrus, therefore artificial insemination was carried out when the sign of estrus was known. The signs of estrus cattle were the age has been mature, it always makes a sound, the vulva is reddish, always urinating, her vulva is swollen and clitoris enlarged. The model showed that the large number of male cattles reduced the risk of artificial insemination failure. Another effort to reduce this risk effectively was routine checks to keep animal health under control. Farmers who had high economies of scale could check cattle regularly compared to farmers who had economies below the average scale.

Managerial implications

The managerial implications of these findings consisted of a series of actions carried out systematically to mitigate and reduce the risk of feed, sick cattle and artificial insemination failure. The risk of difficulty finding feed becomes collective problem because it occurred in most farmers. The high economic scale in cattle business influenced the level of efficiency in obtaining feed. Colony or integrated farms were needed so that cattle management could achieve its economies of scale, therefore it was easier and cheaper to obtain feed rather than individual/own management. Good management was needed so that beef cattle breeding businesses were easy to develop. The first step that needed to be done by the local government was to synchronize the perceptions of farmers about the importance of managing livestock collectively or by groups. The next stage was farmer training in collective/colony management and technology adoption. Assistance from extension staff was also needed to strengthen group institutions by arranging organizational structures and clear partition of tasks among group members.

Integrated or colony cow house was needed to facilitate the health care of cattles, such as cow houses were easy to clean, space for cattle was unlimited, cattles were easily bathed, cattle feed had good storage and cattle was easily monitored. Cattle examination could also be performed together to reduce the risk of being attacked and transmitted by disease. Managing cattle together could reduce operational costs of livestock businesses, such as the feed procurement and livestock maintenance. The management of livestock together also allowed farmers to apply standardized maintenance, cattle weight, selling prices and harvest schedules so that they could improve their bargaining position in the market better.

The results of this study were in line with the study of Lestari *et al*. (2017) which showed that the cattle fattening business in Bojonegoro was not yet optimal where body weight gain was

Tabel 6. Parameter estimator and significant test for artificial insemination failure

Variables	Coefficient	S.E	P-value
Farmer age	0.004	0.018	0.798
Formal education	0.504	0.500	0.314
The number of cattle last year	-0.892	0.502	0.075*
Ratio of female cows last year	271.558	145.007	0.061*
Cattle inspection	-1.111	0.543	0.041*
Special cattle cage	0.803	0.684	0.240
Constants	2.404	2.098	0.252

still around 0.55 kg/day and needed to be increased again. Groups of smallholder cattle farmer generally do not consider the break even point (BEP). Break even point of livestock business was highly dependent on the type of cattle where Simmental breeds, Ongole breeds (PO) and Limousine breeds required minimum 7, 8 and 6 respectively (Emawati *et al*., 2008). The results of the study in the northern Bolaang Mongondow indicated that farmers must have at least 5 cattles to obtain BEP (Bawinto *et al*., 2016). In general, the income of smallholder cattle farmers still needs to be improved with the adoption of technology. In general, traditional farms even though they have business scale 15 cattles, but if it is calculated on a business basis, their income are still below regional minimum wages (Hoddi *et al*., 2011).

Conclusions

Beef cattle farmers in Bojonegoro Regency were dominated by traditional farmers in productive age with the highest education in elementary school. Most farmers made beef cattle breeding business as side business. Farmer households had a low average per capita income below the national poverty line. The main or priority risk faced was the availability of feed and livestock diseases. Both of these risks often occurred and had high severity impact. The failure of artificial insemination was risk that also needed to be addressed because this risk was directly related to the breeding business, although the impact was not high according to farmers, but the frequency of occurrence was relatively frequent. The level of farmer education, family income and scale of livestock business could reduce the risk of feed scarcity. The risk of cattles being sick could be reduced by improving hygiene and care of cattle along with the scale of the business. The risk of artificial insemination failure could be reduced by increasing the scale of business and routine health checks of cattle. Changes in the pattern of livestock management from individuals to groups with colony farms could be a solution to mitigate these risks. This strategy allowed farmers to increase economies scale and livestock maintenance and health checks at once.

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