Empowerment Model of Dairy Farmers in Providing Animal Feed Logistics During the Long Drought in Boyolali Regency

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Article Info

Abstract

Boyolali Regency is one of the largest cow milk producers in Indonesia. This region controls 20% of the national demand for cow's milk and 72% of the demand for cow's milk in Central Java. However, Boyolali Regency is very often hit by the drought, which affects the residents' dairy farms. Farmers have difficulty in fulfilling animal feed logistics, including clean water and green feed sourced from grasses. Ironically, the farmers have to sell some of their dairy cows to cover the operational costs incurred for other cattle. This study aims to design an empowerment model for dairy farmers in providing animal feed logistics during drought due to a long drought in Boyolali Regency. This study is a qualitative descriptive study. This research is using interviews, observation, and document analysis as their data collection techniques. The data validity technique used in this research is the triangulation method, with an interactive analysis model as data analysis. Farmers complain about the provision of animal feed logistics during drought. Farmers are forced to sell their dairy cows to reduce operating costs. Some farmers buy clean water through a 6.000-liter water tank truck for IDR 300,000 per tank, the estimate is that it can be used for the fulfillment of clean water of approximately 10 heads of dairy cows, or about 10 days. Dairy farmer empowerment model needs to be designed by mapping the logistics needs of animal feed during drought. Clean water assistance from the government is not sufficient for farmers' needs, and the fulfillment of green feed has not been touched by government programs. Therefore, the design of this empowerment model requires deep involvement from the government in empowering farmers to have empowerment in dealing with drought.

Abstrak

Kabupaten Boyolali merupakan salah satu penghasil susu sapi terbesar di Indonesia. Wilayah ini menguasai 20% kebutuhan susu sapi nasional dan 72% permintaan susu sapi di Jawa Tengah. Namun, Kabupaten Boyolali sangat sering dilanda kekeringan yang berdampak pada peternakan sapi perah warga. Peternak kesulitan memenuhi logistik pakan ternak, termasuk air bersih dan pakan hijau yang bersumber dari rumput-rumputan. Ironisnya, peternak harus menjual sebagian sapi perahnya untuk menutupi biaya operasional yang dikeluarkan untuk sapi lainnya. Penelitian ini bertujuan untuk merancang model pemberdayaan peternak sapi perah dalam penyediaan logistik pakan ternak pada saat kemarau panjang akibat kemarau panjang di Kabupaten Boyolali. Penelitian ini merupakan penelitian deskriptif kualitatif. Penelitian ini menggunakan wawancara, observasi, dan analisis dokumen sebagai teknik pengumpulan datanya. Teknik validitas data yang digunakan dalam penelitian ini adalah triangulasi metode, dengan model analisis interaktif sebagai analisis data.Petani mengeluhkan penyediaan logistik pakan ternak saat kemarau panjang. Peternak terpaksa menjual sapi perah mereka untuk mengurangi biaya operasional. Sebagian petani membeli air bersih melalui truk tangki air 6.000 liter seharga Rp 300.000 per tangki, perkiraannya bisa digunakan untuk

pemenuhan air bersih kurang lebih 10 ekor sapi perah, atau sekitar 10 hari.Model pemberdayaan peternak sapi perah perlu dirancang dengan memetakan kebutuhan logistik pakan ternak selama kekeringan. Bantuan air bersih dari pemerintah belum mencukupi kebutuhan petani, dan pemenuhan pakan hijau belum tersentuh program pemerintah. Oleh karena itu, perancangan model pemberdayaan ini membutuhkan keterlibatan yang mendalam dari pemerintah dalam memberdayakan petani agar memiliki keberdayaan dalam menghadapi kekeringan.

1. INTRODUCTION

Boyolali Regency is one of the largest cow milk producers in Indonesia. Boyolali Regency controls nearly 20% of the national demand for cow's milk. For Central Java itself, Boyolali Regency dominates 72% of the need for cow's milk in the province. Boyolali Regency dominates about 65% of the dairy cow population in Central Java. Boyolali District has 5 (five) sub-districts that are centers for dairy farming, including Mojosongo District, Musuk District, Ampel District, Cepogo District, and Boyolali City.

However, Boyolali Regency is very prone to drought. This is due to the long drought that this area often experiences. This has an impact on the residents' dairy farms. Farmers have difficulties in fulfilling the logistics of animal feed, starting from clean water, to green feed sourced from grasses. Ironically, the farmers have to sell some of their dairy cows to cover the operational costs incurred by their other cattle. This study aims to design an empowerment model for dairy farmers in providing animal feed logistics during drought due to long drought in Boyolali Regency. The National Disaster Management Agency (BNPB) noted that Boyolali has ranked 142 areas in the high drought risk class, with a score of 24 on the 2013 Indonesian Disaster Risk Index (IRBI) (BNPB, 2013).

Drought is a type of natural disaster that occurs slowly or slow onset, with a long duration until the rainy season arrives. This long drought has a very broad impact on various sectors, such as health, economy, social, education, and so on (Nuarsa, et al., 2015; Surmaini, 2016). Furthermore, Nuarsa et al. (2015) wrote that this drought can have a very broad and complex impact, and of very long duration. The comprehensive and complex impact on this layer of life is because water is a basic need for humans and every living thing, which cannot be replaced with other resources.

Other researchers have conducted research related to the logistics of cattle farming (Ⅳ Holdova et al., 2019; Santoso et al., 2013; Winarso, 2001). Ⅳ Holdova et al. (2019) through their research examined the effect of age on the productivity and quality of milk production of dairy cows, indicating the need for livestock stock development. Furthermore, Santoso et al. (2013), through their research related to the potential for developing a dairy farming business, found a more optimized agribusiness paradigm. Another researcher by Winarso (2001) through his research examining the role of land transportation in increasing the efficiency of livestock distribution, found the results of a study that so far the distribution transportation pattern has not been optimized. Some of these studies are very useful for researchers as references in this study. However, there have not been many studies that have focused on examining dairy farming which is associated with the empowerment model of dairy farmers in providing animal feed logistics during drought due to long drought. The focus of this research is to examine this topic in greater depth.

2. METHODS

This research uses a qualitative descriptive method. This descriptive method describes the current situation during the research and examines the causes of these symptoms (Travers et al. in Sevilla, 1993). On the other hand, qualitative research is research that aims to describe social symptoms based on indicators that are used as the basis for symptoms (Slamet, 2006). The descriptive qualitative method in this research is used to describe the empowerment model of dairy farmers in providing animal feed logistics during drought due to a long drought in Boyolali Regency.

This research is located in Boyolali Regency. The choice of this location is considered appropriate considering Boyolali Regency is the center of the largest dairy cow milk producer in Central Java, which dominates by 72%, even at the national level controlling 20% of the national demand for cow's milk. Meanwhile, 65% of the dairy cow population in Central Java is dominated by Boyolali Regency.

The object of this research is an individual, with sampling using the purposive sampling method. Sugiyono (2009) wrote that this sampling technique was chosen by considering the competence of the informants. The

key informants in this study are: dairy farmers and employees at the Department of Animal Husbandry and Fisheries (Disnakan) Boyolali Regency.

This study uses primary data support and secondary data. Primary data is a data source that directly provides information to researchers, while on the other hand, secondary data is a data source that indirectly provides information to researchers (Sugiyono, 2009). In this study, primary data was obtained from interviews with key informants, while secondary data was obtained from documents, reports, and literature related to dairy farming and empowerment models.

This study uses 3 (three) types of data collection techniques, namely: interviews, observation, and document analysis. The interview chosen was an unstructured interview, where this was chosen by the researchers to be able to further explore the research results. Observations in this study used unstructured observation and participant observation. This type of observation is used to further explore data from the source of the event and the location of the study (Sutopo, 2002). The observation participants were chosen to get closer to the researchers to the primary data source, through the involvement of the researcher in the daily activities of the key informants. Unstructured observations in this study were carried out concerning the observation signs related to this research, namely related to the empowerment model of dairy farmers in providing animal feed logistics during drought due to a long drought in Boyolali Regency. Furthermore, this study uses document analysis by analyzing various supporting documents such as reports from related agencies. Sugiyono (2009) wrote that the analysis of this document is a complement to the interview and observation method.

The method triangulation technique was chosen as the validity of the data in this study This is done by comparing the results of the interviews with the results of observations and document analysis. Sutopo (2002) stated that writing the same or similar data will be more valid and verified when examined by several different methods. This study uses an interactive analysis model proposed by Milles and Hubberman (Sutopo, 200), where the analysis is carried out by paying attention to 3 (three) main components, which are in the form of cycles, namely: data reduction, data presentation, and drawing conclusions and verification. Data in the form of interviews, observations, and document analysis were selected which could be used further and presented in descriptive form accompanied by supported tables or figures.

3. RESULTS AND DISCUSSION

Boyolali Regency has great potential in the production of milk for dairy cows. Many centers of dairy farming are scattered in this area, such as in Cepogo District, Ampel District, Musuk District, Mojosongo District, to Boyolali City. However, several areas in Boyolali Regency are very prone to drought. Boyolali Regency often experiences a long drought, which can have an impact on dairy farming in the area. During this long dry period, farmers have difficulty in fulfilling animal feed logistics, from clean water to green feed sourced from grasses. This drought inevitably makes farmers have to spend more money to cover operational costs. Ironically, many farmers have to sell some of their dairy cows to cover operational costs.

Drought disasters often occur in Boyolali Regency, usually around the middle of the year, starting from July. In that month, Boyolali Regency is indicated to be classified as very dry. In July, it is not recommended for farmers to cultivate crops, due to the very little water availability. Figure 1 below is the climate mapping in Boyolali Regency during July 2010. It can be seen, the yellow color indicates dry conditions, the orange color indicates the very dry area, and the red color indicates the area is extremely dry. Following are the results of a study related to drought due to a long drought in Boyolali Regency (Verdinan, 2016):
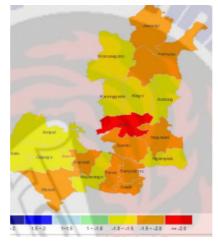

Figure 1. Drought disaster in Boyolali Regency, 2010.

Drought, according to Law Number 24 of 2007 concerning Disaster Management, is a condition in which water availability is very far from water needs for daily living needs, agriculture, and economic and environmental activities. Widyawati (2016) wrote that drought disasters were caused by several factors, including topography, climate, land cover and use, geological conditions, and rainfall. Besides, drought can also occur as a result of human activity that does not obey the rules for using water.

Drought can generally be grouped into 4 (four) categories, namely hydraulic drought, meteorological drought, agricultural drought, and socio-economic drought (Surmaini, 2016). Hydraulic drought is a certain period with insufficient fulfillment of water resources, both on the surface and below the surface, to meet the availability of water in a water resources management system. Furthermore, meteorological drought is the lack of rainfall in an area for a certain period. The hydraulic drought occurred as a result of a long meteorological drought which resulted in a deficit of surface water and groundwater in an area. On the other hand, agricultural drought is a condition in a certain period where there is a decrease in soil moisture which causes the failure of crops without taking into account sufficient surface water resources. Furthermore, a socio-economic drought occurs when the demand for goods of economic value exceeds their availability as a result of a shortage of water supply due to climatic or weather conditions.

The drought disaster in Boyolali Regency has an impact on the residents' dairy farms. The long drought in this area makes the availability of clean water in Boyolali Regency increasingly difficult to find. Besides, the availability of green feed sourced from grass is also decreasing as a result of this long drought. This results in farmers having to spend more money to cover operational costs incurred in their farms. Ironically, there is a phenomenon of farmers who flock to sell some of their dairy cows to cover their operational costs.

The results showed that many farmers complained about the provision of livestock logistics during drought. Many farmers sell their dairy cattle to cover operational costs incurred. Several farmers meet the need for clean water for their dairy cows by buying clean water through a 6.000-liter water tank truck for IDR300.000,- per tank. It is estimated that one water tank can only fulfill the need for clean water of about 10 heads of dairy cows or about 10 days of fulfillment.

This study found the fact that some farmers in Sudimoro Hamlet, Sangup Village, Tamansari District, were forced to sell their livestock to buy clean water, which is very scarce in Boyolali Regency. The long drought that occurred in the area has occurred for 6 (six) months, starting from May 2019. As before entering this long drought period, so far residents have fulfilled their needs for clean water from the reservoir (water resource). However, since the drought occurred in the area, the spring has shrunk, so that the water supply that is distributed to residents' houses has also decreased (Kompas, 2019).

Some farmers are forced to sell their calves to cover the operational costs of their farms. This is because the sale of milk for dairy cows is not sufficient for the logistics needs of animal feed, such as clean water, green feed, and vitamin mixtures for dairy cows. On average, farmers spend IDR400.000,- for animal feed logistics per day for an estimate of 18 dairy cows (detik.com, 2019). Furthermore, some farmers prefer to reduce their livestock numbers. The results showed a phenomenon that is rife in Sangup Village is that farmers flock to sell their livestock to cover operational costs incurred, especially in fulfilling feed logistics. This is because, during the long dry season, clean water and green fodder cannot be obtained easily, and must be purchased given that the grass in the fields and forests dries up. Likewise, the condition of the reservoir (water source) has also begun to decrease. The following can be seen in Figure 2 which shows residents buying clean water to fulfill the logistics of dairy cow feed (Source: detik.com, 2019).

Figure 2. Farmers buy clean water to fulfill animal feed logistics

Concerning this problem, a model is needed. empowerment of dairy farmers, which is designed with an emphasis on mapping the logistics needs of animal feed during drought. The World Bank (Narayan et al., 2002), writes: "Empowerment is the expansion of assets and capabilities of poor people to participate in, negotiate with, influence, control, and hold accountable institutions that affect their lives." Furthermore, Sumodiningrat (2007) wrote that empowerment is an effort made in increasing the independence and ability of the community. This empowerment is done by creating an activity that allows the community to develop in facing its problems. In line with this, Alsop et al. (2006) wrote that empowerment is an increase in the community's capacity to be able to actively participate and determine decisions that affect their lives.

Dairy farmers in Boyolali Regency feel they need a community empowerment program to be able to deal with drought disasters due to this long drought. This is important, considering that the empowerment of the dairy farming community is needed to revive Boyolali Regency as a center for dairy cow milk production in Central Java and also in Indonesia. Empowerment is an element that allows people to be empowered and survive in facing problems and develop themselves in progress (Wikirannolo & Dwidjowijoto, 2007). Perkins and Zimmerman (1995) further wrote that empowerment is an "empowered outcome", as follows: "Empowered outcomes refer to operationalizations of empowerment that allow us to study the consequences of empowering processes. Empowered outcomes of individuals might include situation-specific perceived control and resource mobilization skills."

The drought disaster caused by the long dry season also has an impact on the soaring price of animal feed. Some farmers have to buy cattle feed for IDR500.000,- per small truck, with an estimate that it will run out in just 10 days for 11 cows (Tribunsolo.com, 2019). This condition needs to be realized by the local government, considering that this drought has been a long time and often occurs in the area. Ideally, the local government should carry out community empowerment programs to increase the empowerment of farmers to survive in the face of the long dry season. If not, then this problem will drag on, and Boyolali Regency will gradually decrease its potential in supplying the largest dairy cow milk in Central Java.

The potential for cattle farming in Boyolali District needs to be developed through farmer empowerment programs. This potential needs to be developed, considering that the quantity of cattle in Boyolali is very large, reaching 3,446 cows, consisting of 2.880 dairy cows and 566 beef cattle. The quantity of dairy cows in Boyolali Regency is very large, so it is not surprising that this area is dubbed the City of Milk. Cow's milk commodity is a leading commodity in Boyolali Regency. As of 2020, data reported by the Department of Animal Husbandry and Fisheries (Disnakan) Boyolali Regency recorded the distribution of cattle types in Boyolali Regency including Madura Cows and Bali Cows as many as 0 heads (none), 128 heads of Limousin Cows, 1 head of Brahma Cows, 31 heads of Ongole Cows, 164 heads of Ongole Cattle, 2.808 of FH Cows, and 241 of Simmental Cows.

Table 1. The Data of Farmer and Cattle in Boyolali District

District	Farmer	The number of cattle
Selo	21	42
Ampel	165	442
Cepogo	111	281
Musuk	407	1.183
Boyolali	49	122
Mojosongo	260	1.006
Teras	25	58
Sawit	7	12
Banyudono	24	37
Sambi	75	118
Ngemplak	21	30
Nogosari	21	25
Simo	32	50
Karanggede	10	0
Klego	36	50
Andong	39	50
Kemusu	1	0
Wonosegoro	1	1
Juwangi	1	0
Total	**1.306**	**3.507**

For cattle potential based on age, there were 3.435 cows in the adult category, 84 heifers, and 0 calves (unrecorded). Based on this data, it can be seen that the largest livestock age quantity is adult cattle. This is a potential that needs to be developed, considering that the quantity of productive age cows is in Boyolali Regency.

The potential for farmers in Boyolali Regency is scattered in several areas. The largest quantity of cattle farmers in Boyolali Regency is dominated by Musuk District, which is as many as 407 farmers. Next, Mojosongo District with 260 farmers, and Ampel District with 165 farmers. On the other hand, Musuk District dominates the largest quantity of cattle, which is 1.183 heads. Next, Mojosongo District with 1.006 heads, and Ampel District with 442 heads. The following can be seen in Table 1 (Source: *www.simapi.boyolali.go.id*):

The potential for dairy cows in Boyolali District needs to be improved with various empowerment programs for farmers. Payne (Masrukin et al., 2016: 57) stated that empowerment is to help clients gain power of decision and action over their own lives by reducing the effect of social or personal blocks to exercising existing power, by increasing capacity and self-confidence to use power and by transferring power from the environment to clients.

The principles of empowerment need to be applied in optimizing the potential of dairy farming in Boyolali Regency. Furthermore, this is very important considering that Boyolali Regency is often hit by drought disasters due to a long drought which has an impact on dairy farming in the area. Cattle farmers need to get empowerment programs from the government in increasing their capabilities. Bernard Crick (Azizy, 2003) stated that empowerment is an effort made to empower people by actively participating in the decision-making process. Participation in empowerment is a prerequisite for realizing a more democratic life. Furthermore, Swift and Levin (Mardikanto, 2010) argued that community empowerment refers to the ability of people, especially vulnerable groups to have access to productive sources that enable them to increase their income and to be able to actively participate in the development and various decisions that affect them.

Wikirannolo and Dwijowidjoto (2007) wrote that there are 4 (four) dimensions of community empowerment, namely the dimension of society as the subject of development, dimensions of poverty reduction efforts, dimensions of capacity and support of government officials, and dimensions of strengthening community institutions. Furthermore, Robert Chambers (Alfitri, 2011) stated that community empowerment is a concept of economic development that summarizes social values, which are people-centered, participatory, empowering, and sustainable.

Farmers in Boyolali District need assistance in increasing their capacity. The results showed that there was a phenomenon of decreasing the population of dairy cows in Boyolali Regency. Ironically, many dairy farmers are turning to beef cattle fattening. This can be seen in the last few years many dairy farmers are more interested in fattening beef cattle, compared to increasing the productivity of dairy cows. Conditions in the field indicate that many farmers buy calves to be raised and then resold. This condition causes the number of dairy cows in Boyolali to experience a drastic decline.

This phenomenon is indicated to have arisen due to the increased operational costs in dairy farming so that farmers prefer to fatten beef cattle. This condition occurred in Dungus Hamlet, Seboto Village, Ampel District. This is motivated by the high cost of feed, where the operational costs are not comparable to the low selling price of cow's milk. The research results show that the cost of feed for dairy cows per day is IDR30.000,- per head, even though the production of dairy cows per day is up to 8 liters per head, so if cow's milk is sold at a market price of IDR4.000.000,- per liter, it will be sold IDR32.000,- per day. Moving on from this, the difference is very small. Even so, this difference does not include the operational costs of labor, and so on (Okezone, 2016).

Mandaka and Hutagaol (2005) stated that problems that often occur in dairy farming are divided into 3 (three) sectors, namely: upstream, middle, and downstream. There are problems in the upstream sector, including low cow productivity, high cost of animal feed, insufficient available dairy cow seeds, small ownership scale, and low quality of human resources for farmers. In the middle sector, problems that often arise are the reduced availability of land for feed production, low business capital from banks, low cultivation techniques, conversion of agricultural land to non-agricultural areas, and the absence of integrated cross-sectoral cooperation. On the other hand, problems in the downstream sector include the unstable selling price of calves, to the low price of cow's milk.

In 2007, the phenomenon of decreasing dairy cow population in Boyolali Regency has begun to appear. Gabungan Koperasi Susu Indonesia (GKSI) in Central Java noted that there was a significant decline in milk production in Boyolali Regency in 2007. This can be seen if milk cows usually produce 90.000 liters per day, then there is a quite significant decrease as many as 80.000 liters per day in 2007. This condition is due to the long dry season which has an impact on the availability of food and clean water (Tempo, 2007).

The results showed that the ability to supply cow's milk in Boyolali Regency is still far from fulfilling needs. This can be seen from the total dairy cow population of 88.695 dairy cows, only having the ability to supply milk of 100.000 liters to 120.000 liters per day. The need for milk reaches 252,000 liters per day. Based on this, there is a shortage of cow's milk supply of 132.000 liters to 152.000 liters per day. So, to meet the milk needs of these dairy cows, Boyolali District still needs to add 10.000 to 15.000 dairy cows. Solopos (2015) wrote that the lack of ability to supply milk for dairy cows is due to the only 50% population of dairy cows in Boyolali, or around 12.417 heads of the productive female population of 24.835 heads. This problem is also experienced nationally.

Sulistiyono (2008) stated that domestic cow milk production is still very dependent on dairy farming, amounting to around 110.000 farmers. The daily average production of dairy cow's milk is 1.185 tons of cow's milk which is marketed to the cow's milk processing industry through cooperation. However, this production has not been able to meet the demands of domestic consumers, due to changes in the increasing consumption of cow's milk which is relatively faster than its production.

Based on this, the researchers propose an empowerment model for dairy farmers in providing animal feed logistics during drought due to long drought in Boyolali Regency, as follows:
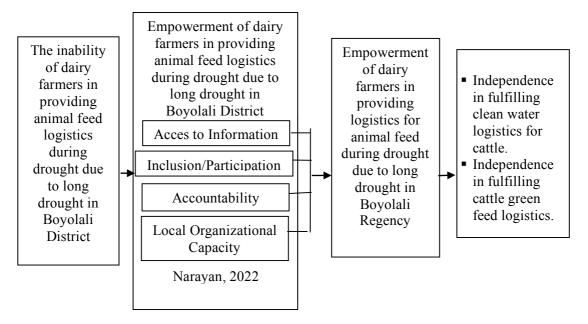

Figure 2. An empowerment model of dairy farmers in providing animal feed logistics during drought due to a long drought in Boyolali Regency

4. CONCLUSION

Based on the research results, it can be concluded that farmers have complained about the provision of animal feed logistics during drought. Farmers are forced to sell their dairy cows to reduce operating costs. Some farmers buy clean water through a 6.000-liter water tank truck for IDR300.000,- per tank, the estimate is that it can be used for the fulfillment of clean water of approximately 10 heads of dairy cows or about 10 days.

The empowerment model for dairy farmers needs to be designed by mapping the logistics needs of animal feed during drought. Clean water assistance from the government is not sufficient for farmers' needs, and the fulfillment of green feed has not been touched by government programs. Therefore, the design of this empowerment model requires deep involvement from the government in empowering farmers to have empowerment in dealing with drought.

5. ACKNOWLEDGEMENT

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