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Inhibiting factors on the sustainable livestock development: case of dairy cattle in Indonesia

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Abstract. Sustainable livestock development is still a national strategic issue in Indonesia. The research objective was to examine the inhibiting factors for sustainable livestock development, especially for dairy cows. The research was carried out at the Tirtasari Kresna Gemilang, Joint Business Group (KUB) animal husbandry institution, Malang District, East Java Province. Research variables include inhibiting factors (X), ecological dimensions (Y₁), economical dimensions (Y₂), social and cultural dimensions (Y₃), institutional dimensions (Y₄), and technological dimensions (Y₅). Respondents of the study were 196 dairy cattle farmers who were members of KUB Tirtasari Kresna Gemilang. The data were obtained using the Focus Group Discussion (FGD) method and survey with a likert scale. Data were analyzed partially using simple linear regression. The results showed that the inhibiting factors had a negative and significant effect on sustainable livestock development, especially in the economical dimensions, the social and cultural dimensions, the institutional dimension, and the technological dimension. shows that the inhibiting factors for sustainable livestock development should be the concern of all stakeholders in the national dairy industry.

1. Introduction

The definition of sustainable livestock development is the process of building or developing a livestock rearing business with the aim of breeding and fattening which is carried out continuously and continuously. The term sustainable based on the Republic of Indonesia of Law Number 22 of 2019 about Sustainable Agricultural Cultivation Systems is the management of living natural resources in producing agricultural commodities in order to better and sustainably meet human needs by preserving the environment.

Sustainable livestock development in principle has 5 (five) dimensions, namely the ecological dimension, the economical dimension, the social and cultural dimension, the institutional dimension, and the technological dimension [1-4], but the fact is that efforts to develop sustainable livestock always experience various obstacles and problems, including the main problems at the community farm level [5]. Government Regulation No. 6 of 2013 about Farmer Empowerment as an effort to support sustainable smallholder livestock. Empowerment of farmers can be done through livestock institutions [6].

Government Regulation Number 6 of 2013 states that farmer empowerment is all efforts made by the government, provincial governments, city/district governments, and stakeholders in the field of animal husbandry and health to increase independence, provide convenience and business progress, and improve competitiveness and farmer welfare. Efforts to empower farmers that are closely related to



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sustainable livestock development include a plant-livestock integration system with a zero waste concept ([7-12], utilization of local resources [13] to suppress imports [14].

Various efforts made by the government in supporting sustainable livestock development are not necessarily without inhibiting factors [15]. Inhibiting factors can widen the gap between expectations and reality. Inhibiting factors are divided into internal and external barriers. Internal barriers are in the form of weaknesses (weaknesses), while external barriers are in the form of threats (threats). Internal blockers can be controlled, while external barriers are difficult to control. Various terms that are closely related to inhibiting factors are aspects of vulnerability [16-19], and aspects of business risk [20-21]. The inhibiting factor must be the attention of the government and all stakeholders, because no matter how good the plan, it will be in vain if you never learn from the past.

This study aims to examine the inhibiting factors for sustainable livestock development in the Joint Business Group (KUB) of Tirtasari Kresna Gemilang, Malang District. The novelty of this study is to review the influence of the inhibiting factors on each dimension of sustainable livestock development, namely there are 5 dimensions, the ecological dimension, the economical dimension, the social and cultural dimension, the institutional dimension, and the technological dimension. The contribution of this article as a means of developing science considering the development of science can be done with the findings of research results. Another contribution is that the importance of this article is as a public policy database, considering that public policy requires academic texts as its foundation.

2. Materials and methods

2.1. Materials

The research consists of 6 main variables, namely inhibiting factors and 5 dimensions of sustainable livestock development which include ecological dimensions, economical dimensions, social and cultural dimensions, institutional dimensions, and technological dimensions. The inhibiting factors act as independent variables, while the five dimensions of sustainable livestock development are the dependent variables. The indicators of each variable are described in Table 1..

Table 1. Research variables and indicators

Variables and indicators	
Inhibiting factor (X)	
a. Does not have a permanent partnership with the Dairy Processing Industry (IPS)	X _{1.1}
b. Lack of capital to form new business units (product diversification)	X _{1.2}
c. Human Resources (HR) is low	X _{1.3}
d. Milk laboratory equipment is not complete	X _{1.4}
e. Farmers morality (honesty)	X _{1.5}
f. Competition with other livestock groups	X _{1.6}
g. Assistance from the central and local governments is still limited	X _{1.7}
h. There is no government intervention in determining the selling price of fresh milk	X _{1.8}
Ecological dimension (Y1)	
a. Providing forage for livestock	Y _{1.1}
b. Provide protective plants	Y _{1.2}
c. Make use of unused land	Y _{1.3}
d. Processing and managing livestock waste	Y _{1.4}
e. Utilizing livestock manure	Y _{1.5}
f. Pay attention to the slope of the cage	Y _{1.6}
g. Pay attention to the height of the cage	Y _{1.7}
h. Pay attention to the density of the cage	Y _{1.8}
i. Providing clean water to support livestock business	Y _{1.9}
j. Pay attention to the humidity of the cage	Y _{1.10}

k. Pay attention to the temperature of the cage	Y _{1.11}
Economical dimension (Y2)	
a. Providing livestock production facilities	Y _{2.1}
b. Marketing of milk and dairy products	Y _{2.2}
c. Analyzing the amount of subsidies for livestock production facilities	Y _{2.3}
d. Manage production requests	Y _{2.4}
e. Distribute labor	Y _{2.5}
f. Own a farm	Y _{2.6}
g. Owning livestock	Y _{2.7}
h. Providing working capital	Y _{2.8}
i. Contributing to Regional Original Income (PAD)	Y _{2.9}
j. Determining farm labor wages	Y _{2.10}
k. Increase livestock business income	Y _{2.11}
Social and cultural dimension (Y3)	
a. Making time for business in the field of animal husbandry	Y _{3.1}
b. Supporting family participation in livestock farming	Y _{3.2}
c. Managing the environment as a result of the existence of a livestock business	Y _{3.3}
d. Determining the number of business actors in the livestock sector	Y _{3.4}
e. Respond to community complaints and protests if they are the impact of livestock business	Y _{3.5}
f. Responding to the needs of the farming community	Y _{3.6}
g. Increase income in the livestock sector	Y _{3.7}
h. Improve knowledge and skills in the field of animal husbandry	Y _{3.8}
Institutional dimension (Y4)	
a. Participate in livestock coaching/extension programs	Y _{4.1}
b. Collaborating with the government in an effort to support sustainable livestock development	Y _{4.2}
c. Collaborating with role models in an effort to support sustainable livestock development	Y _{4.3}
d. Participate in livestock organizations or institutions	Y _{4.4}
e. Collaborating with credit providing institutions in an effort to support livestock development	Y _{4.5}
f. Cut the chain of trade (marketing) of livestock commodities	Y _{4.6}
g. Empowering livestock institutions	Y _{4.7}
h. Creating a marketing network for livestock commodities	Y _{4.8}
Technological dimension (Y5)	
a. Managing the biological environment	Y _{5.1}
b. Having and mastering communication tools to support livestock business	Y _{5.2}
c. Mastering housing technology	Y _{5.3}
d. Mastering technology for processing and utilizing livestock waste limbah	Y _{5.4}
e. Participate in livestock extension program penyuluhan	Y _{5.5}
f. Improving the formal education of workers/employees	Y _{5.6}
g. Knowledge of feed and feed processing	Y _{5.7}
h. Knowing about livestock health	Y _{5.8}
i. Knowledge of livestock reproduction	Y _{5.9}
j. Knowledge of livestock rearing management	Y _{5.10}
k. Knowing about livestock product processing technology	Y _{5.11}
l. Mastering the vehicle to support the livestock business	Y _{5.12}
m. Own and control livestock product processing machines	Y _{5.13}

2.2. Methods

The research was conducted from August to October 2020 at the Joint Business Group (KUB) of Tirtasari Kresna Gemilang, Malang District, East Java Province. KUB Tirtasari Kresna Gemilang is a dairy farming institution that has business units for animal feed and fresh milk marketing. They has 196 dairy farmers spread over Ngabab Village, Pujon Subdistrict and its surroundings. The research sample is all dairy farmers who are members of KUB Tirtasari Kresna Gemilang. Data were collected using Focus Group Discussion (FGD) and survey methods. The survey method was carried out by means of interviews and filling out questionnaires with a Likert scale of +1 to +5.

Research data consists of primary data and secondary data. Primary data was obtained directly from dairy farmers who are members of KUB Tirtasari Kresna Gemilang, while secondary data was obtained from various supporting sources, such as daily and monthly reports of KUB Tirtasari Kresna Gemilang, Central Statistics Agency, Department of Livestock and Animal Health. The primary data were then partially analyzed using simple linear regression with SPSS 26.0 Software. Mathematically, the simple linear regression equation based on Figure 1 is as follows:

$$Y = a + bX$$

Y indicates the criterion variable or 5 (five) dimensions of sustainable livestock development, namely the ecological dimension (Y_1), the economical dimension (Y_2), the social and cultural dimension (Y_3), the institutional dimension (Y_4), and the technological dimension (Y_5), and X shows predictor variables or inhibiting factors, while is a constant variable and b is a linear regression direction coefficient.

3. Results and discussion

Efforts to evaluate the impact of inhibiting factors on sustainable livestock development are solely carried out to support farmer empowerment in accordance with Government Regulation of the Republic of Indonesia Number 6 of 2013 concerning Farmers Empowerment. The effect of inhibiting factors on sustainable livestock development on the ecological dimension is shown in Table 2.

Table 2. Inhibiting factors and ecological dimensions

model	Coefficients ^a		t	Sig.
	Unstandardized coefficient	Standardized coefficient		
	B	Std. Error	Beta	
(Constant)	34.419	5.904		5.838 .000
IF	-.289	.234	-.486	-1.646 .005
a. Dependent Variable : Ecological Dimensions				
b. t tabel : 1.652				
c. IF : Inhibiting Factors				
Sources : data processed, 2021				

The results of the linear regression analysis in Table 2 show that the inhibiting factor has a negative effect on the ecological dimension of -.289, because the regression coefficient is negative, then the regression equation is $Y = 34,419 - .289X$. These inhibiting factors have a negative but not significant effect on the ecological dimension. These conditions indicate that the role of KUB Tirtasari Kresna Gemilang on the ecological dimension is quite good so it is not influenced by inhibiting factors. The availability of land used to grow forage in the form of grass and agricultural waste is one of the driving factors, especially KUB Tirtasari Kresna Gemilang provides complete feed for members. One form of service of KUB Tirtasari Kresna Gemilang to its members is to send animal feed directly to the location of the cage. This form of service is carried out to maintain member satisfaction and loyalty [22-25] stated that feed is one of the three pillars of livestock business. The three pillars of livestock business are breeding, feeding, and management. The influence of the inhibiting factors on sustainable livestock development on the economic dimension is shown in Table 3.

Table 3. Inhibiting factors and economical dimensions

model	Coefficients ^a			t	Sig.
	Unstandardized coefficient		Standardized coefficient		
	B	Std. Error	Beta		
(Constant)	28.423	2.615		5.838	.000
IF	-.481	.114	-.486	-4.623	.001
a. Dependent variable : economical dimensions					
b. t tabel : 1.652					
c. IF : inhibiting factors					
Sources : data processed, 2021					

The results of the linear regression analysis in Table 3 show that the inhibiting factor has a negative effect on the economical dimension of -.486, because the regression coefficient is negative, then the regression equation is $Y = 28.423 - .481X$. These inhibiting factors have a negative and significant effect on the economical dimension. These conditions indicate that the role of KUB Tirtasari Kresna Gemilang on the economical dimension is not good enough so that it is influenced by inhibiting factors. Not having a permanent partnership with the Dairy Processing Industry (IPS), limited capital, competition with other livestock groups, and limited assistance from the central and regional governments are the main causes of the weak economical dimension. The economic dimension also supports the development of livestock business [26-28]. The influence of the inhibiting factors on sustainable livestock development on the social and cultural dimensions is shown in Table 4.

Table 4. Inhibiting factors and social and cultural dimensions

model	Coefficients ^a			t	Sig.
	Unstandardized coefficient		Standardized coefficient		
	B	Std. Error	Beta		
(Constant)	35.126	2.819		6.816	.000
IF	-.334	.137	-.515	-4.424	.001
a. Dependent variable : social and cultural dimensions					
b. t tabel : 1.652					
c. IF : inhibiting factors					
Sources : data processed, 2021					

The results of the linear regression analysis in Table 4 show that the inhibiting factor has a negative effect on the social and cultural dimensions of -.334, because the regression coefficient is negative, then the regression equation is $Y = 35.126 - .334X$. These inhibiting factors have a negative and significant effect on the social and cultural dimensions. These conditions indicate that the role of KUB Tirtasari Kresna Gemilang on the social dan cultural dimension is not good enough so that it is influenced by inhibiting factors. The morality of breeders, incomplete milk laboratory equipment, the absence of government intervention in determining the selling price of fresh milk, and the low human resources of farmers are the main causes of weak social and cultural dimensions. Human resources of farmers as the driving force of livestock business have a vital role in the development of livestock business [29-32]. The influence of the inhibiting factors on sustainable livestock development on the institutional dimension is shown in Table 5.

Table 5. Inhibiting factors and institutional dimensions

model	Coefficients ^a			t	Sig.
	Unstandardized Coefficient		Standardized Coefficient		
	B	Std. Error	Beta		
(Constant)	29.552	2.714		10.256	.000
IF	-.465	.128	-.649	-4.847	.001
a. Dependent variable : institutional dimensions					
b. t tabel : 1.652					
c. IF : inhibiting factors					
Sources : data processed, 2021					

The results of the linear regression analysis in Table 5 show that the inhibiting factor has a negative effect on the institutional dimensions of -.465, because the regression coefficient is negative, then the regression equation is $Y = 29.552 - .465X$. These inhibiting factors have a negative and significant effect on the institutional dimensions. These conditions indicate that the role of KUB Tirtasari Kresna Gemilang on the institutional dimension is not good enough so that it is influenced by inhibiting factors. Not having a permanent partnership with the Dairy Processing Industry (IPS), lack of capital to form new business units (product diversification), breeder morality (honesty), and competition with other livestock groups are the main causes of weak institutional dimensions. [33,34]states that farmer institutions are able to strengthen farmer access to resources. These resources play an important role in the development of farmingbusiness [35,36]. The influence of the inhibiting factors on sustainable livestock development on the technology dimension is shown in Table 6.

Table 6. Inhibiting factors and technological dimensions

model	Coefficients ^a			t	Sig.
	Unstandardized Coefficient		Standardized Coefficient		
	B	Std. Error	Beta		
(Constant)	35.414	2.615		12.550	.000
IF	-.379	.112	-.818	-4.419	.001
a. Dependent variable : technological dimensions					
b. t tabel : 1.652					
c. IF : inhibiting factors					
Sources : data processed, 2021					

The inhibiting factor has a negative effect on the technological dimension of -.379, because the regression coefficient is negative, then the regression equation is $Y = 35.414 - .379X$ (Table 6). These inhibiting factors have a negative and significant effect on the technological dimensions. These conditions indicate that the role of KUB Tirtasari Kresna Gemilang on the technological dimension is not good enough so that it is influenced by inhibiting factors. The low human resources of farmers, incomplete milk laboratory equipment, and limited assistance from the central and local governments are the main causes of the weakness of the technological dimension. The technological dimension is part of the livestock business resources [37,38].

4. Conclusions

Inhibiting factors had a negative and significant effect on sustainable livestock development, especially in the economical dimensions of -.481, the social and cultural dimensions of -.334, the institutional dimension of -.465, and the technological dimension of -.379. Inhibiting factors for sustainable livestock development should be the concern of all stakeholders in the national dairy industry. These inhibiting

factors include does not have a permanent partnership with the Dairy Processing Industry (IPS), lack of capital to form new business units (product diversification), Human Resources (HR) is low, milk laboratory equipment is not complete, farmers morality (honesty), competition with other livestock groups, assistance from the central and local governments is still limited, there is no government intervention in determining the selling price of fresh milk.

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