

# Analysis of Factors Affecting the Population of Grazed Cattle in Baluran National Park

Zazin Fahresi Alamanda, Siti Azizah\*, Harry Nugroho

Faculty of Animal Science, University of Brawijaya. Jl. Veteran, Malang, 65145, Jawa Timur, Indonesia

\* Corresponding Author. E-mail address: siti.azizah@ub.ac.id

**Abstract**— Sidomulyo hamlet is one of the most significant contributors of grazed livestock around Baluran National Park, with 2,220 cows. This study aims to determine the factors that affect the number of livestock populations grazed in Baluran National Park to provide information for stakeholders to determine what factors affect the number of livestock populations. This information is essential to reduce the number of illegal grazing in the Baluran National Park Area. The study was conducted in Sidomulyo Hamlet, Sumberwaru Village, Banyuputih District, Situbondo Regency, East Java Province, from June 1 to October 18, 2021, with 72 respondents. The data analysis method uses multiple linear regression analysis with the SPSS 20 program. The results showed that the coefficient of determination in the regression model was 38.9 percent, so the number of livestock populations could be explained by the independent variables contained in the model. Factors that significantly influence the number of populations in the Sidomulyo hamlet are the number of private livestock ownership, age, and education. Gender and experience do not significantly affect the number of livestock populations in the Sidomulyo hamlet.

## I. INTRODUCTION

Illegal grazing in the Baluran National Park area by farmers in buffer villages can interfere with conservation (Azizah & Kawedar, 2020). Forest buffer villages are ideally designed to contribute to maintaining conservation (Lamichhane et al., 2019). Sidomulyo Hamlet is one of the most significant contributors to grazed cattle around Baluran National Park. Based on data from the Sumberwaru health center in 2021, there were 2,220 cattle owned by Sidomulyo farmers grazed in the Baluran National Park Area, most of which were dominated by *Gaduhan* cattle.

A *Gaduhan* cattle or livestock profit sharing system is one of the practices that involves two parties, the owner of the capital and the farmer (Nugraha et al., 2021). The practice is carried out aimed at increasing the farmers income without requiring significant capital (Rohani et al., 2021). The cattle in Sidomulyo Hamlet have been carried out from generation to generation, which can destroy the Baluran National Park conservation forest (Azizah & Kawedar, 2020). Besides economic motives, the motivation farmer for raising cattle in Sidomulyo Hamlet is to show their social status in society (Azizah et al., 2021). This motive has increased the number of livestock in Sidomulyo Hamlet.

Characteristics of farmers such as age, experience, education, gender, and scale of business influence them in the livestock business. (Mulyawati et al., 2016; Utami et al., 2016;

Hidayat et al., 2019) The study aims to determine the factors that affect the number of livestock populations grazed in Baluran National Park to provide information for stakeholders to determine what factors affect the number of livestock populations. This information is important to reduce the number of illegal grazing in the Baluran National Park Area.

## II. RESEARCH METHODS

The research was conducted in Sidomulyo Hamlet, Sumberwaru Village, Banyuputih District, Situbondo Regency, East Java Province, from 1<sup>st</sup> June to 18<sup>th</sup> October 2021. Site selection is carried out by purposive sampling. The population used in this study was beef cattle farmers in Sidomulyo hamlet, with 247 farmers. The determination of the sample using the Slovin formula with an error rate of 10 percent was 72 respondents.

$$n = \frac{N}{1 + N e^2} = \frac{247}{1 + (247 (0,1)^2)} = 71,18$$

The data analysis method uses multiple linear regression analysis with the SPSS 20 program (Hartono, 2013). The formula of the regression equation with five independents variable is:

$$Y = b_0 + b_1 \cdot X_1 + b_2 \cdot X_2 + b_3 \cdot X_3 + b_4 \cdot X_4 + b_5 \cdot X_5$$

Description:

Y: Number of *Gaduhan* cattle populations (Animal Unit)

$b_0$ : constants

$X_1$ : respondent's age (year)

$X_2$ : gender

$X_3$ : education level

$X_4$ : experience (years)

$X_5$ : private cattle ownership (Animal Unit)

## III. RESULTS AND DISCUSSION

Sidomulyo Hamlet near STPNW Baluran (National Park Management Section) 2 Karangtekok. Sidomulyo Hamlet is one of the hamlets located in Sumberwaru Village. The area of Sumberwaru Village is approximately 17,730 hectares, with the majority of forests with an area of 10,050 hectares. The total population in Sumberwaru Village is 7,919 people (3,885 males and 4,034 females). The majority of the population speak Madurese. The total number of farmers in Sidomulyo Hamlet is 247 people, with 2,220 cows (1,611.75 Animal Units) owned.

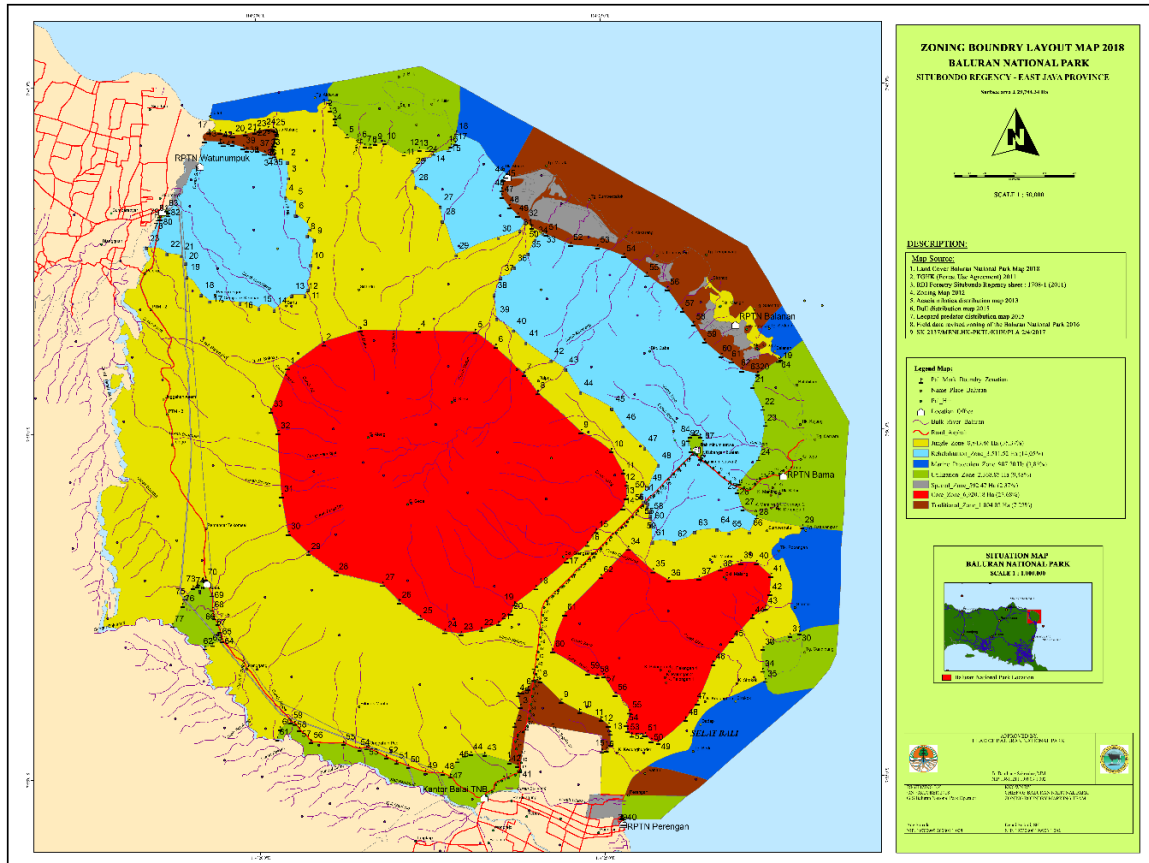


Fig. 1. Baluran National Park zoning boundry layout map

Source: Baluran National Park

TABLE 1. Characteristics of Respondent.

No.	Characteristics	Number of respondents	Percentage
		People	(%)
1	Farmers age		
	< 30 years	5	6.94
	31 – 40 years	23	32.94
	41 – 50 years	26	36.11
	51 - 60 years	12	16.66
	> 60 years	7	9.72
2	Gender		
	Male	63	87.50
	Female	9	12.50
2	Level of Education		
	0 - 6 years	40	55.55
	7 – 9 years	23	31.94
	10 – 12 years	8	11.11
	> 12 years	1	1.38
4	Experience		
	< 10 years	20	27.78
	11-20 years	25	34.72
	21-30 years	17	23.61
	>30 years	10	13.89

Source: Primary data (2021), processed

The characteristics of the respondents were male primarily with 87.50 percent, aged 41-50 years with 36.11 percent, had 0-6 years education level with 55.55 percent, and had 11-20 years of experience raising livestock with 34.72 percent.

*Coefficient of Determination*

The coefficient of determination indicated by the R-square value of 0.389 shows that 38.9 percent of the total population

can be explained by the independent variables in the regression model.

TABLE 2.

Variable	b	t count	Sig
Constant	44,571	2,963	0,004
Age	-12,230	-2,509	0,015*
Gender	0,220	0,616	0,540
Education	-1,583	-2,046	0,045*
Experience	3,046	1,570	0,121
Private livestock ownership	1,583	5,234	0,000*
R-square	0,389		
F count	8,420		0,000
F table	2,36		
t table	1,99		

Source: SPSS output results

Based on the table of the results of multiple linear regression analysis, the following equation can be obtained:

$$Y = 44,571 - 12,230.X_1 + 0,220.X_2 - 1,583.X_3 + 3,046.X_4 + 1,583.X_5$$

The results of the F test at the SPSS output obtained a value of 8.420 with a significance value of 0.000. This shows that overall the model is fit. The test results of the influence of independent variables on dependent variables partially using the t-test can be seen in table 2. The interpretation of each dependent variable on the model can be described as follows:

### 1. Farmers Age

The calculated t value of -2.509 with a significant value of  $X_1$  to Y is  $0.015 < 0.05$ , so it can be concluded that the respondents' age significantly affects the number of populations. The age of Sidomulyo farmers from 27 to 70 years. Most farmers were aged 41-50 years, with 26 respondents. The farmer's age variable significantly influences the number of cattle owned. Cattle investors in Sidomulyo choose the farmer's age as one of the considerations for entrusting about their livestock. The higher the age of farmers, the more the number of cattle populations deposited by investors. Investors and farmers prioritize trust over making a deal in writing because it will reduce the trust between the two parties (Nugraha et al., 2021)

### 2. Gender

The calculated value of t is 0.616, with the significance value of  $X_2$  to Y being  $0.540 > 0.05$ , so it can be concluded that gender has no significant effect on the number of populations. The gender of the majority of respondents was male, with 63 respondents. Gender did not significantly influence the increase in the number of livestock populations in Sidomulyo Hamlet.

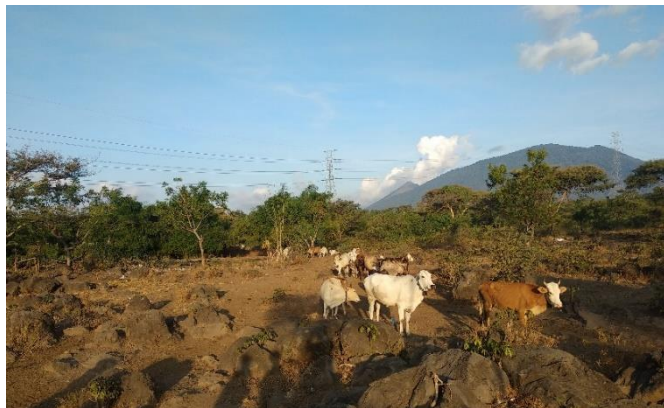


Fig. 2. Cattle rearing in Baluran National Park

### 3. Level of Education

The calculated t value of -2.046 with the significance value of  $X_3$  to Y is  $0.045 < 0.05$ , so it can be concluded that education significantly influences the number of populations. Most farmers' education levels in Sidomulyo are 0 – 6 years, with 40 respondents. The level of education has a significant influence on the number of livestock owned by farmers. The higher the education level of farmers, the more the number of livestock owned. Cattle investors see that education level has a relationship with insights related to the livestock business. Farmers with a low level of education generally get knowledge and skills from other farmer, so some farmers do not know good breeding information (Risziqina et al., 2019)

### 4. Experience

The calculated t value is 1.570 with a significance value of  $X_4$  to Y of  $0.121 > 0.05$ , so it can be concluded that experience has no significant effect on the number of populations. The majority of farmers' experience of 11-20 years was 25 respondents. The farmers experience does not significantly influence the number of farmers populations. Cattle investors in Sidomulyo do not see the experience of farmers as one of the

factors for raising their cattle. The farmers experience is quite long, but farmers still apply traditional maintenance methods such as extensive rearing (Utami et al., 2016)

### 5. Number of private ownerships

The calculated t value is 5.234 with a significance value of  $X_5$  to Y of  $0.000 < 0.05$ , so it can be concluded that the amount of private ownership significantly affects the population. The more cattle population owned by the famers, the more cattle the investor will entrust to the farmer. Cattle investors in Sidomulyo believe that the more farmers own, the easier it will be to run a livestock business.

## IV. CONCLUSION

The coefficient of determination in the regression model is 38.9 percent, so the number of livestock populations can be explained by the independent variables contained in the model. Factors that significantly influence the number of populations in the Sidomulyo Hamlet are the number of private livestock ownership, age, and education. Gender and experience do not significantly affect the number of livestock populations in Sidomulyo Hamlet. However, there are still many dependent variables that can still be used in the future research to deepen the analysis of the factors that affect the cattle population in Sidomulyo Hamlet.

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