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Causing factors of declining trend on samosir panorusan goat population as endangered species in Samosir Island

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Abstract. A declining trend of Samosir Panorusan goat population has been identified. As the Panorusan is an endemic and endangered species goat where the pure breed only 250,000 heads left, a research was conducted in order to find the cause factors for declining trend of population from April to June 2018 in Pangururan District, Samosir Regency. The method used was multiple linier regression analysis with variabel limitations such as goat feed, disease, breeders' experience, local culture and marketing rate of productive ewe. This research was conducted by asking directly to Panorusan goat breeders. The total of 55 goat breeders was divided into 2-3 breeders/villages. The results of this study indicated that the variable of local culture was significantly as a dominant factor that causing a declining trend of Samosir Panorusan goat population.

1. Introduction

Panorusan Samosir goat is an endemic goat on Samosir Island [1] which is an outstanding tourist destination. Tourism policy in Indonesia try to protect any endangered species include Panorusan Samosir goat.

This goat is believed by the Batak people as the incarnation of the ancestors of the Batak people originating from Mount Pusuk Buhit [2]. In 2017, by the Director General of Animal Husbandry of the Republic of Indonesia, this goat was designated as a new species called Panorusan Samosir goat [3].

Local culture of Batak has a belief that sacrificing Panorusan goat will bring good to them. Examples if someone is sick then he or she could be healed when a goat is sacrificed. However, sacrificed goat has characteristics such as white coloured either on skin, hoofed and horned. In addition, the goat should be male and 4-6 months old. These characteristics are considered to be the characteristics of ancestral goats that are also assumed to be the typical characteristics of Samosir's endemic goat and in the Batak language this white goat called Siladdas. Based on these characteristics, it is known that the population of Panorusan Siladdas are only around 250,000 left on Samosir Island [4].



Panorusan Siladdas goat, on its development has been crossed breed with other goats such as Kacang and Muara goats so other colors emerged from Panorusan goats. Even so, Panorusan Siladdas goats remain the main ones chosen for local cultural events [5]. The population of goat either Siladdas or Panorusan cross breed and its declining trend of was showed in Table 1.

Table 1. Declining trend population of Samosir Panorusan Goat

No	Sub district	Year				
		2013	2014	2015	2016	2017
1	Pangururan	3,702	3,665	3,585	2,962	2,453
2	Ronggornihuta	1,174	1,168	1,112	970	854
3	Simanindo	1,656	1,651	1,612	1,135	661
4	Harian	132	151	175	276	203
5	Sianjur	407	413	428	117	94
	Mulamula					
6	Palipi	1,217	514	515	990	921
7	Sitiotio	330	727	726	321	316
8	Nainggolan	501	1,217	1,220	286	242
9	Onan Runggu	701	366	357	489	395
	Total	9,821	9,872	9,699	7,546	6,139

Source: [6]

Due to the declining Panorusan Goat population, a research needs to be conducted in order to know the cause factors of declining trend. The result of research then could be used as a recommendation to Samosir Government and also Livestock Services of North Sumatera Province when they make policy on improving Panorusan goat population.

2. Materials and Method

This research was carried out in Pangururan District, Samosir Regency. This research was conducted from April to May 2018. The type of research was an explanatory quantitative research which described the influence of the relationship between variables such as goat feed, breeder's experience, goat disease, local culture, and the rate of marketing of productive ewes against the decline of Samosir Panorusan goat population in Pangururan District. The population of this study were all goat breeders in Pangururan Sub district, Samosir Regency, totalling 55 breeders after conducting simple random sampling method among originally 120 breeders.

In general, the percentage of errors that can be tolerated in social studies is 5% - 20%. In this study, the error tolerance was of 10%. The method used in sampling was simple random sampling method where all elements of the population have the same opportunity to be selected as sample members. Sampling was done randomly without paying attention to strata in the population.

3. Results and Discussion

In this chapter, results and discussion were focused on 5 factors which identified influenced declining trend of goat population which were goat feed, disease, breeders' experience, local culture and marketing rate of productive ewes.

3.1. Goat feed

Feed is the most important factor for livestock to meet their body needs. An interview was conducted on how much feed that breeders gave to their goats. Table 2 showed feed (qualitatively) be given to goat in Pangururan, Samosir.

Tabel 2. Feed (qualitatively) of Panorusan Goat

No	Parameter	Number of Breeders	Percentage (%)
1	Enough	18	33
2	Not enough	37	67
Total		55	100

Source: Primary data after processing, 2018.

Table 2 showed that the goats in Pangururan Sub district have not been fulfilled the needs of their feed. The sample which stated that the feed given was enough were as many as 18 people with a percentage of 33% and the sample that stated not enough were as many as 37 people with a percentage of 67%. Goats on Samosir Island were taken out of cage at around 11:30 a.m. to grassy land. The goat was tied with a rope of about 4 meters so that the goats eat grass around the 4 meter area. Sometimes goats were moved. Then at 6 o'clock the goats were taken home. Sometimes in a cage goat were given extra forage for example Gamal (*Gliricidia sepium*). Therefore generally goats do not get enough forage.

On average, Panorusan goats have a life weight of about 25 kg so that they need forage around 2.5 kg per head per day. This need is not enough just with field grass, therefore forage should be added in cage. [7] Stated that what should be given is forage such as Kelor (*Moringa olifera*), which are widely grown by people in Pangururan. Moringa is an introduction plant that began to be promoted in Samosir as a protective plant for coffee. [8] Conducted a study in Samosir that if Moringa plants were used as protective plants for coffee with age below 5 years, could produce 833 ton fresh Moringa/year while in 2017 there were 2,453 goats in Pangururan sub district and need 912.5 ton fresh legume such as Moringa. It was predicted by [8] that Moringa could be fulfilled the need for forage for Panorusan goat. Moreover, as Moringa is a species of legume which contain Protein about 26%, Moringa could improve production rate of goat such as Panorusan such according to [9] enough protein support good reproduction. In the last decade, it was identified that there was a decline in Panorusan production rate [6].

3.2. Breeder experience

Looking at the system of maintenance carried out by the community, it is important to know that the experience of breeder is very influential on the maintenance system on farm. The longer the breeder raises more experience on goat the more breeders could maintain his farm. The experience of farming is the knowledge gained in carrying out maintenance and also running a farm business.

Table 3. Breeder's experience

No	Breeding Experience (years)	Number of breeders	Percentage (%)
1	1-5	23	42
2	6-16	24	43
3	17-26	8	15
Total		55	100

Based on Table 3. It can be seen that the breeder experience influences the decline in Samosir Panorusan Goat population. The breeding experience that was owned by breeders the highest at 6-6 years intervals as many as 24 people with a percentage of 43%, while the lowest with 17-26 year intervals of 8 people with a percentage of 15%. This is in line with [10] opinion which stated that generally breeders in the goat breeding business were still traditional. They give a lot to nature.

Procurement of seeds, feeding, maintenance or so on has not used modern technology. The goat maintenance they do is just a side business from agriculture.

3.3. Goat disease

To support the health of Samosir Panorusan Goat, in addition to breeders must provide sufficient and quality feed; breeders must also follow the implementation of health programs as well. Because only healthy goats and can get enough food that can increase production [11]. There was also parameter that was obtained to find out how often Samosir Panorusan Goat livestock were attacked by disease, the type of disease that can attack and how to prevent diseases that were commonly carried out in Pangururan subdistrict.

Table 4. Goat disease

Parameter	Number of Breeders (People)	Percentage (%)
Often	38	69
Sometimes	13	24
Never	4	7
Total	55	100

Source: Primary data after processing, 2018.

Based on Table 4. It can be seen that there were three frequencies of disease occurred in Pangururan sub district. The most commonly obtained frequency were 69%, sometimes as many as 24% and never 7%. Diseases or viruses that often attack Panorusan goat were bloat and diarrhea which were caused by maintenance, environmental quality, and outbreak management, in accordance with [11] which stated maintenance management including housing, feed, animal inspection could trigger disease on goat. [12] Mentioned that goat suffer also from gastrointestinal parasitism thus influenced its reproduction. The environment is very important to be observed as the cause of disease for example cleanliness. While outbreaks can occur unpredictably, this is very dependent on the conditions of the farm.

3.4. Local culture

Local culture in Samosir Regency is influenced by Local Wisdom. The interest of breeders in having Panorusan goat is influenced very much by local culture as there are several occasions that someone has to sacrificed goat especially Siladdas. Thus price of Siladdas is very attractive and very much higher than price of cross breed Panorusan goat. For example Siladdas age 4 months's price is 2,800,000 IDR while cross breed's price with weight around 25 kg is 1,000,000 IDR.

Several occasions which occur and sacrifice Salads for examples death ritual, entering new house (margondang), traditional ceremony of rejecting reinforcements. In addition, there are still people who believe in the power of their ancestors, so they still perform rituals such as bringing offerings in the form of Siladdas goats.

Table 5 Showed that the type of local culture was one of the things that can affect the Samosir Panorusan Goat population. Traditional culture in Samosir Regency, such as ritual offerings to ancestor sacrifice Samosir Panorusan goat more often. Even though the availability of this goat is, i.e. Siladdas already decreased however demand is high. This is in accordance with [2] statement, this type of custom has to be done every year in Pusuk Buhit mountain to commemorate the ancestors believed by the people of Samosir. So that if the traditional culture are still held in high esteem, plus other type of local culture such as margondang and death ritual, it is predicted that the need for Siladdas is high and could harm the population.

Table 5. Local culture that sacrifice Samosir Panorusan goats

No	Type of Local culture	Number of breeder (people)	Percentage (%)
1	Ritual for ancestor	50	91
2	Margondang	3	5
3	Death ritual	2	4
Total		55	100

Source: Primary data after processing, 2018.

3.5. Productive ewes marketing rate

Livestock expenditure is the number of livestock that has died, cut and sold. Table 6. Shows that the sale and cutting of productive ewes in Pangururan subdistrict, Samosir Regency was high, as much as 76%, while the respective ewes cutting was 24%. This was consistent with the statement of [13] who said that there was a high level of goat traded in the animal market, can reduce the productive livestock population.

Table 6. The rate of ewes marketing

No.	Parameter	Number of breeders	Percentage (%)
1	Productive ewes	42	76
2	Respective ewes	3	24
Total		55	100

Source: Primary data after processing, 2018.

3.6. Correlation between all factors

Correlation among all factors which influenced declining of Panorusan Goat was presented on Table 7. The factors which influence the declining of Panorusan Goat population were goat feed, breeder's experience, disease, local culture and productive ewes marketing. Among all factors, local culture significantly caused declining on Panorusan Goat population (<0.05 which was 0,000). Local culture uses Panorusan Siladdas mostly for event such as ritual for ancestor, margondang, death ritual. In addition, they use cross breed Panorusan on event for examples house construction, weddings and building monuments / graves.

Table 7. SPSS results factors that influence the declining of Panorusan Goat population

Variable	Regression Coefficient	Standard error	T Cal	Sig
Constanta	3.745	1.360	2.753	0.008
Goat Feed : x1	0.512	0,124	0.512	0.611
Breeder's experience : x2	1.082	0,54	1.082	0.284
Disease : x3	0.831	0,116	0.831	0.410
Local culture : x4	14.885	0,369	14.885	0.000
Productive ewes marketing rate : x5	-0.759	0,301	-0.759	0.452
R2 : 0,855				
F Cal: 57.794				

4. Conclusion

There were five factors which influenced declining population of Panorusan goat such as goat feed, breeder's experience, disease, local culture and productive ewes marketing. Among all factors, local culture caused declining on Panorusan Goat population significantly. As local culture has to be sustaining as well as Panorusan Goat, an effort should be taken to increased goat population.

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