DECISION SUPPORT SYSTEM FOR CATTLE LOCATION SUITABILITY USING THE AHP METHOD

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Article Info	ABSTRACT
	Currently, many breeders do not meet the criteria for the placement of appropriate and correct livestock locations in the manufacture of cattle pens. This causes the cows to become sick often and many die, because the cages are not clean and healthy. Cages that are not clean and healthy also have an impact on the community, especially those around the livestock location. The AHP method is used as a decision support system to determine the location of cattle that are suitable for farmers, especially in the Deli Serdang area. The results of determining the location of suitable livestock are based on parameters or criteria such as ecological parameters, institutions, human resources, infrastructure development, and technology and regional development.

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1. INTRODUCTION

Livestock place or cage is a place for livestock to eat, sleep, rest and perform daily activities. Another function of the cage is as a shelter from cold temperatures at night and from direct sunlight, making it easier to feed, drink, and make it easier for us to always maintain health and take treatment. Of all the things that have been said, then for the success of a cage farm, it has a very important function and greatly affects the success of raising cattle.

There are many cattle cages in Indonesia, especially in the Deli Serdang area, which are not feasible. Starting from the roof, floors, sanitation, and the environment and location of livestock placement. Until now, many people do not meet the correct criteria for making cattle pens. As a result, many cows die suddenly due to unhealthy cages and this condition can also have a negative impact on the health of the people who live around the location of the cattle. The cowshed, which is very close to the house and is in a residential area, causes many problems, especially in terms of health, comfort. and security, both for livestock owners and for other people who are also close to the location of the livestock.

Based on the problems above, the author threatens a decision support system for choosing a good location for cattle in Deli Serdang by using the AHP method, so that it can be used as a source of information for people who want to know where to find good cattle in Deli Serdang so that their livestock runs smoothly. the purpose of this research is to determine the appropriate location or suitable to be used as a place to raise cattle using the AHP method.

2. RESEARCH METHODE

The *Analytical Hierarchy Process* is a model of a decision support system that is used in determining decisions based on input as indicators. This AHP method is a hierarchical form that is described based on the order of needs starting from the goals, influencing factors, along with the criteria and sub-criteria used. A functional hierarchy with human perception as the main input is an AHP device, through the scoring stage by choosing which location in accordance with the specified criteria, namely the quality of the cage, the quality of the land, the location of the building, the construction of the cage.

This research was conducted by determining the location of the establishment of the farm by the decision maker using the AHP method, then the results of the determination of the location will be obtained which one is suitable for carrying out the farm. This research was conducted on January 5, 2021 in Deli Serdang Regency. The types of data and collection techniques carried out include observation, interviews, and also taken from the context on the internet and several journals to support primary data.

3. RESULT AND ANALYSIS

1. Determining the weight for each criterion is given by the decision maker before choosing the desired alternative location to determine the weight the decision making will compare the level of importance of each parameter, Table 1 below is the result of determining the weight for each criterion using the AHP method.

Table 1 : Comparative Calculation Results for the Weight of Each Criterion

No.	Parameter	Bobot	Sub Parameter	Bobot
1.	SDM dan Kelembagaan	0,15	Kepadatan Penduduk	0,60
			Lembaga *Input*	0,20
			Lembaga *Output*	0,20
2.	SDA dan Kesesuaian Ekologis	0,50	Kesuburan Tanah	0,05
			Kemiringan	0,20
			Curah Hujan	0,05
			Ketinggian Wilayah	0,20
			Indeks Daya Dukung	0,15
			Kepadatan Wilayah	0,12
			Kepadatan Usaha Tani	0,12
			Kepadatan Ekonomi	0,11
3.	Teknologi dan Pengembangan Wilayah	0,25	Perkembangan Desa	0,20
			Teknologi Budidaya	0,50
			Teknologi Pasar	0,30
4.	Infrastruktur	0,10	Sarana Prasarana	0,10

2. Determining the weight of each alternative for each criterion, to determine the decision rating of each alternative, scoring is used based on the instructions of the Director General of Livestock (2002) Alternative sub-district areas. so that it will be known the suitability of the location of the village or sub-district. Table 2 below is the result of the comparison of each alternative for the criteria for the sub-districts in Deli Serdang district.

Table 2 : Calculation Results of Weighting Matches for Each Alternative Criteria

Desa \ kriteria	Lubuk pakam	Deli Tua	Patumbak	Pancur Batu	Sunggal	Beringin	Galang	sibolangit	Percut sei tuan	Tanjung morawa
P1	0,09	0,11	0,09	0,10	0,10	0,11	0,10	0,10	0,10	0,11
P2	0,09	0,09	0,09	0,09	0,10	0,10	0,09	0,11	0,11	0,09

P3	0,09	0,09	0,09	0,09	0,10	0,10	0,09	0,11	0,11	0,09
P4	0,09	0,11	0,10	0,10	0,09	0,11	0,10	0,10	0,10	0,10
P5	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10
P6	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10
P7	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10
P8	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10
P9	0,09	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,08	0,10
P10	0,10	0,12	0,12	0,10	0,08	0,09	0,11	0,12	0,08	0,10
P11	0,10	0,10	0,11	0,10	0,10	0,09	0,10	0,11	0,09	0,10
P12	0,10	0,10	0,10	0,09	0,11	0,09	0,10	0,10	0,09	0,10
P13	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10
P14	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,12	0,12	0,10
P15	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10

3. calculating the average weight for each decision rating per alternative, calculating the average weight for each rating for each alternative, taking into account the weight of each criterion and sub-criteria table 3 is the calculation of the average weight of each decision rating for each criterion.

Table 3: Calculation of the average weight of each decision rating for each alternative

Criteria/ VILLAGE	SDM			SDA								infrastructure			TOOL
	0,15			0,50								0,25			0,1
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15
	0,6	0,2	0,2	0,05	0,2	0,05	0,2	0,15	0,12	0,12	0,1	0,2	0,5	0,3	0,1
LubukPakam	0,09	0,09	0,09	0,09	0,10	0,10	0,10	0,10	0,09	0,10	0,10	0,10	0,10	0,10	0,10
DeliTua	0,11	0,09	0,09	0,11	0,10	0,10	0,10	0,10	0,10	0,12	0,10	0,10	0,10	0,10	0,10
Patumbak	0,09	0,09	0,09	0,10	0,10	0,10	0,10	0,10	0,10	0,12	0,11	0,10	0,10	0,10	0,10
PancurBatu	0,10	0,09	0,09	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,09	0,10	0,10	0,10
Sunggal	0,10	0,10	0,10	0,09	0,10	0,10	0,10	0,10	0,10	0,08	0,10	0,11	0,10	0,10	0,10
Beringin	0,11	0,10	0,10	0,11	0,10	0,10	0,10	0,10	0,10	0,09	0,09	0,09	0,10	0,10	0,10
Galang	0,10	0,09	0,09	0,10	0,10	0,10	0,10	0,10	0,10	0,11	0,10	0,10	0,10	0,10	0,10
Sibolagit	0,10	0,11	0,11	0,10	0,10	0,10	0,10	0,10	0,10	0,12	0,11	0,10	0,10	0,12	0,10
PercutSeiTuan	0,10	0,11	0,11	0,10	0,10	0,10	0,10	0,10	0,08	0,08	0,09	0,09	0,10	0,12	0,10

TanjungMorawa	0,11	0,09	0,09	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10

4. The results of the calculation of the average weight of each decision rating for each alternative will produce the appropriate location based on the AHP calculation, Table 4 below is the result of determining the appropriate location using the AHP method.

Table 4: Location Determination Results

No.	Districts	AHP SCORE
1.	LubukPakam	0,24600
2.	DeliTua	0,26260
3.	Patumbak	0,25065
4.	PancurBatu	0,25170
5.	Sunggal	0,25510
6.	Beringin	0,25875
7.	Galang	0,25490
8.	Sibolangit	0,26275
9.	PercutSeiTuan	0,25245
10.	TanjungMorawa	0,25970

From the results of calculations using the AHP method, Sibolangit sub-district was obtained as the sub-district with the highest score, so that the area in Sibolangit sub-district was a suitable village for the distribution of livestock.

4. CONCLUSION

The conclusions of this study are:
- Giving preference weights to decision makers using the AHP method gives decision makers the flexibility to assign weights based on the level of importance of each parameter to other parameters.
- The results of the suitability of the location are based on the AHP method which considers several parameters such as ecological parameters, human resources, and institutions, technology and regional development, as well as parameters for infrastructure development.
- According to the results, the Sibolangit sub-district has all the criteria that have been determined so that it is suitable for establishing a livestock location there.

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