The Potential of Developing Beef Cattle Cluster Model Based on Food Crops and Plantation and Grazing in Muna Regency

by Musram Abadi

The Potential of Developing Beef Cattle Cluster Model Based on Food Crops and Plantation and Grazing in Muna Regency

Musram Abadi[1*], Harapin Hafid[1], Achmad Selamet Aku[1], La Ode Muh. Munadi[1]

Faculty of Animal Husbandry, Halu Oleo University, Anduonohu, Kendari City
Southeast Sulawesi, Postal Code 93121, Indonesia
Email : musram.abadi79@uho.ac.id

ABSTRACK

The development of animal husbandry is closely related to the development of an area and the carrying capacity of forage forage both in quality and quantity. Muna Regency is one of the areas that has considerable potential in the development of beef cattle, because the existence of beef cattle is still very much in demand by the community to be cultivated even though it is a side business. Muna Regency also has sufficient land and natural feed availability, so the factor of regional potential in the provision of forage and the need to meet animal feed is very important. This study aims to determine the development of a beef cattle cluster model based on food crops, plantations and grazing in Muna Regency, which is carried out for 3 months. Determination of the location in this study was carried out deliberately (purposive sampling). Data analysis used in this study includes Location Quotient (LQ) analysis, analysis of feed availability based on land availability and agricultural by-products, and analysis of the feasibility criteria for cluster model development areas. The results showed that the muna district had the potential for the development of the Beef Cattle Cluster Model Area, namely; 1) Based on Food Plants with the distribution of development areas in Kabawo, Kabangka and Kontukowuna Districts, 2) Based on plantation crops consisting of IV development areas, namely (a) Region I spread over 5 sub-districts, namely Maligano, South Wakorumba, Batukara, Pasir Putih, and Pasikolaga District; (b) Region II is spread across three sub-districts, namely Parigi, Bone and Marobo Districts; (c) Region III is spread across three sub-districts, namely Tongkuno, South Tongkuno and Lohia Districts; and (d) Region IV consists of two districts, namely Napabalano and Lasalepa Districts; and 3) The potential for the development of a beef cattle cluster model area in Muna Regency based on pasture areas is Watoputi District and Kontunaga District.

Keywords: Development, Cluster Model, Beef Cattle.

INTRODUCTION

The potential for livestock development has good prospects in the future because the demand for products derived from livestock will continue to increase along with the increase in population, income and public awareness to consume high nutritious food as the effect of the increase in the education level of the population. The potential that can be developed from various fields of livestock, namely beef cattle because it provides the need for meat whose demand continues to increase, this is reinforced by the statement of Priyanto (2011), namely the need for beef

in Indonesia shows an increasing trend every year, likewise imports continue to increase. at an increasingly high rate, both beef imports and feeder cattle imports. Such conditions require stakeholders to immediately implement a strategy. According to Diwyanto and Priyanti (1996) the main challenge in developing animal husbandry is the implementation of agricultural revitalization and food security programs whose main objective is to increase agricultural productivity (including animal husbandry) through optimization of local resources. For this reason, there needs to be strategic and sustainable efforts in

business management so that high productivity and efficiency can be achieved.

Muna Regency is one of the areas that has considerable potential in the development of beef cattle, because the existence of beef cattle is still very attractive to the community for cultivation, even though it is a side business. Muna Regency also has sufficient availability of land and food from nature (Surahmanto., Et al. 2014), so that livestock development is closely related to the development of an area and the carrying capacity of forage forage both in quality and quantity (Abadi, et al., 2019), therefore regional potential in providing forage and the need to meet animal feed is very important (Rukmana, 2005).

Based on data from the BPS of Muna Regency in a period of 3 years, it was reported that the population of beef cattle in Muna Regency in 2017 was 56,795 heads, increasing in 2018 by 66,777 heads and increasing again in 2019 as many as 76,247 heads with a growth rate of 15.87% more. high compared to the growth rate of the beef cattle population in Southeast Sulawesi which only reached 6.42% in the same time frame (BPS, 2020).

The type of beef cattle that is kept by many breeders is Bali Cows. Bali cattle are mostly kept by breeders because besides being easy to adapt to their environment, they can live in critical land, have good digestibility for feed, high percentage of carcass, are resistant to disease, stable prices and even tend to increase every year. The aim of developing Bali cattle is to increase the population of Bali cattle, absorb employment, manage good livestock raising, and increase community income (Thalib, 2002).

Muna Regency has the potential to support further development efforts, such as the availability of Natural Resources (SDA), especially the availability of Human Resources (HR), but the availability of these resources has not all been optimized for the development of beef cattle. To support the Muna Regency government program in the development of beef cattle, a study was conducted on the potential for developing a Beef Cattle Cluster Model based on food crops, plantations and pasture land in Muna Regency.

MATERIALS AND METHODS

This research was conducted in Muna Regency, Southeast Sulawesi in 2019. The location was determined by purposive sampling. Sources of research data are secondary data obtained from relevant agencies which include statistical data on the general description of the area, human resources (population), and the potential for land and its use. The research was conducted using a survey method, which describes the problem as it is and based on ongoing facts. The survey method is a research method that takes a sample from a population using a questionnaire as a tool in data collection (Singarimbun and Effendy, 1995).

Data analysis used in this study includes Location Quotient (LQ) analysis (Ron Hood, 1998) and analysis of feed availability based on land availability and agricultural by-products (Fariani and Evitayani, 2008; Nell and Rollinson, 1974) and Analysis of Criteria for Designing Development Areas. Based on Regional Hierarchy (Rustiadi and Panuju, 2012).

RESULTS AND DISCUSSION

Beef Cattle Population in Muna Regency

Beef cattle in Muna Regency is one of the leading commodities in the livestock sub-sector and is a business that can provide benefits to additional sources of income for the community. Data for 2019, reports that the livestock population in Muna Regency is 66,777 beef cattle, 154 buffalo, 97 horses, 14479 goats and 223 pigs. (BPS, 2020) as shown in Figure 1.
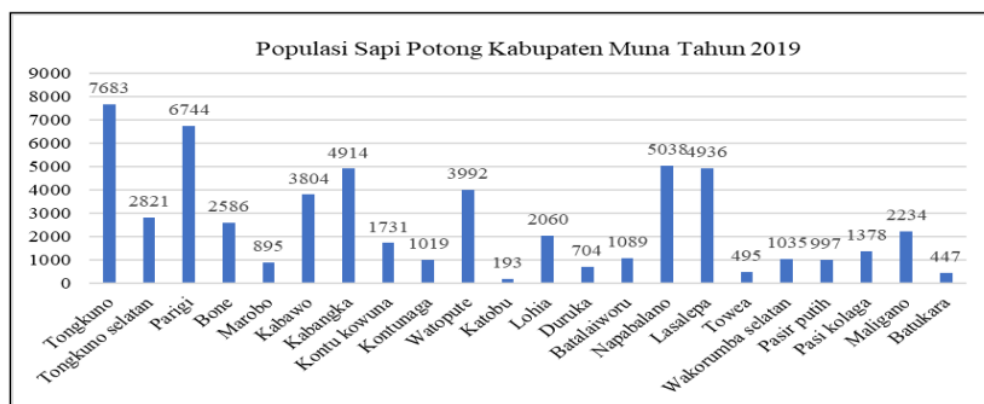
Figure 1. Population of Beef Cattle in Muna Regency
Source: BPS Muna Regency, 2020

Analysis of the Potential Carrying Capacity of Land (Livestock Capacity)

Based on the same calculations and assumptions, then the calculation of the carrying capacity is carried out based on the sub-district. This calculation is also carried out based on land use in each sub-district, production of forage types by district and production of agricultural by-products by sub-district in Muna Regency. This step was taken to determine the holding capacity of each area in Muna Regency in order to ascertain the beef cattle cluster development model in Muna Regency. The calculation of the carrying capacity based on the sub-district is presented in Table 1.

Table 1. KPPTR Value for the Development of Beef Cattle Cluster Model in Muna Regency in 2019

Categories	KPPTR Value Based on Availability of District Forage
Positive (+) 17.830 ST	Tongkuno (42 ST), Parigi (5016 ST), Bone (2263 ST), Marobo (1205 ST), Kabawo (3043 ST), Kabangka (2198 ST), Kontukowuna (1717 ST), Kontunaga (1525 ST), Watopute (917 ST), Napabalano (206 ST), Towea (798 ST), Wakorumba Selatan (1117 ST), Pasir Putih (1296 ST), Pasikolaga (72 ST), Batukara (1647 ST)
Negative (-)	Tongkuno Selatan (-129 ST), Katobu (-208 ST), Lohia (-759 ST), Duruka (-334 ST), Matalaiworu (- 473 ST), Lasalepa (-2765)

Source: Analysis Results, 2019

Based on forage production and agricultural by-products, it is found that the capacity is 17,830 livestock units. Natural forages are not only found in natural grazing areas but are also found on various vacant lands which do have the potential to provide natural forage.

Forage forage is one of the most indispensable ingredients for animal feed and has great benefits for the life and sustainability of the livestock population. Forage (forage) given to livestock is divided into two types, namely grasses and legumes (Abadi, et. Al. 2019)

Analysis of the Main Animal Commodity Base in Muna Regency

Beef cattle as a leading commodity of ruminant livestock is based on the results of LQ analysis of livestock commodities (ruminants) in Muna Regency. The LQ value ≥ 1 in beef cattle is found in Tongkuno, South Tongkuno, Parigi, Kabangka, Watupute, Napabalano, Lasalepa

and Maligano Districts while the rest are in the LQ <1 range (0.5-0.95). For more details, it is presented in Table 2.

Table 2. LQ Value of Leading Commodities for Beef Cattle in Muna Regency in 2019

Categories	District LQ Value
Base LQ ≥1	Tongkuno (1,16), Tongkuno Selatan (1,02), Parigi (1,14), Kabangka, (1,0), Watupute (1,08), Napabalano (1,13), Lasalepa (1,13), Maligano (1,01)
Non Base LQ<1	Bone (0,98), Marobo (0,78), Kabawo (089), Kontukowuna (0,86), Kontunaga (0,57), Katobu (0,47), Lohia (0,85), Duruka (0,51), Batalaiworu (0,94), Towea (0,86), Wakorumba Selatan (0,85), Pasir Putih (0,87), Pasikolaga (0,95), Batukara (0,71)

Source: Analysis Results, 2019

Based on Table 2, it shows that the results of the LQ analysis are only in a few districts which can be used as the basis for developing the beef cattle cluster model in Muna Regency. The determination of Tongkuno, Tongkuno Selatan, Parigi, Kabangka, Watupute, Napabalano, Lasalepa and Maligano Districts is supported by several factors, including the significant population, the availability of large enough land, the ease of marketing, the availability of breeder resources, the availability of feed and produce sources. follow-up agriculture and the existence of supporting infrastructure for beef cattle business that has been run by the local community from generation to generation.

While the distribution of non-base areas is in accordance with the LQ analysis, influenced by the proportion of the total population in a certain sub-district which is lower than the base sub-district, but this area can still be used as a beef cattle development area in Muna Regency, which is based on supporting factors others, such as the availability of land, human resources, marketing, sources of food and agricultural by-products and the availability of supporting infrastructure. Therefore, the results of this LQ analysis are used as a guide in determining the priority scale of the sub-district area for the development of the beef cattle cluster model in Muna Regency while still considering the supporting factors for the area feasibility criteria for developing the intended beef cattle cluster model.

Analysis of Determination of Development Areas Based on Regional Hierarchy

The criteria for assessing the feasibility of developing a beef cattle cluster model in Muna Regency used an approach to 7 aspects, namely: (1) Physical conditions including: Land suitability and availability, HPT area, and availability of agricultural waste feed sources; (2) The population of cattle; (3) Economic conditions include: base commodity bali cattle (LQ), and cattle livestock commodity market; (4) Human Resources Aspects: Bali cattle breeders and agricultural extension workers; (5) Institutional: farmer groups and financial institutions; (6) Infrastructure and accessibility include the availability of roads, ports, electricity; and (7) Regulatory / Policy Support in the form of compliance with RTRW and national policies with the feasibility of developing the beef cattle cluster in Muna Regency in each sub-district in Muna Regency.

The regional plan for developing the beef cattle cluster model in Muna Regency is directed at village areas that have land potential, and is supported by the availability of facilities and infrastructure in the area that can support the Development of the Beef Cattle Cluster Model in Muna Regency. The scope of the area is not

limited by administrative boundaries but is determined by its function, so the scope of a production center can be relatively wide consisting of parts of a village area, it can also be relatively small consisting of one or more than two parts of a village area.

The development includes an area that will be used for the allotment of beef cattle development, so that it will have a positive impact on the economic activities of farmers. The development of the Muna Regency Beef Cattle Cluster Model refers to the existing data around the production concentration area. The data referred to are the availability of land, both existing and potential land (including the area of the sub-district), farmer institutions, regional facilities and infrastructure (electricity, farm roads, input production stalls), as well as compliance with official planning. The determination of the area is intended so that the development of the Beef Cattle Cluster Model in Muna Regency can be maximally developed based on the supporting elements of area.

Model Area of Beef Cattle Cluster Based on Food Crops, Plantation and Pasture in Muna Regency

The development includes an area that will be used for the allotment of beef cattle development, so that it will have a positive impact on the economic activities of farmers. The development of the Muna Regency Beef Cattle Cluster Model refers to the existing data around the production concentration area.

Food Crop Based Beef Cattle Cluster Areas and Models

The distribution of the development area for the Muna Regency Beef cattle cluster model based on food plants is determined based on the food crop regulations and its by-products that can be used as a source of animal feed ingredients. Kabawo, Kabangka and Kontukowuna Districts are the three sub-districts that are prioritized in developing a beef cattle cluster model that is supported by by-products of rice and maize which can be processed and utilized to meet beef feed needs.

Based on the data obtained, the rice fields in Kabawo District are 409 hectares, Kabangka is 170 hectares, and Kontu Kowuna District is 164 hectares with the potential for rice straw as much as 4,458 tons. The potential for maize crops in Kabawo District is 2,200 hectares, Kabangka is 997 hectares, and Kontu Kowuna District is 1,875 hectares with the potential for corn straw as much as 380,400 tons. The high potential of feed sourced from rice straw and corn straw, requires simple technology through the fermentation process.

The business of raising cattle in a food crop area can optimally utilize local resources and by-products of rice and maize crops. Meanwhile, cattle are used as a source of raw material for organic fertilizers which can be used to increase soil fertility in rice fields.

Cow manure in the form of feces, urine and leftover feed can be processed into solid and liquid organic fertilizers to be used in the plantation area, while the rest can be sold to increase farmers' income. A cow can produce 8-10 kg of manure every day, 7-8 liters of urine every day and when processed into organic fertilizer (solid and liquid) it can produce 4-5 kg of fertilizer. Thus, one cow can produce around 7.3-11 tons of organic fertilizer per year, while the use of organic fertilizer on rice fields is 2 tons / ha for each planting so that the potential for organic fertilizers can support the need for organic fertilizer for 1.8 -2.7 hectares with two crops per year (Hayanto B, et al., 2002).

Cow manure can reduce the cost of procuring fertilizers, which at the same time can reduce production costs in addition to preserving organic matter, thereby increasing income (Hutabarat, 2002). Thus,

the benefits obtained in one area of land are greater than if only planting corn alone.

Table 3. Distribution of Development Areas for Food Crop Based Beef Cattle Clusters in Muna Regency

District	Central (Cluster) Support Development	Buffer (Hinterland)
1. Kabawo[2]	1. Bente 2. Kontumere 3. Kasaka 4. Rangka	1. Kawite-Wite 2. Lamanu 3. Wantiworo 4. Lamaeo 5. Kambawuna 6. Bea 7. Sukamaju 8. La Impi
2. Kabangka[2]	1. Wataliku 2. Sari mulio 3. Kabangka 4. Lakandito 5. Wakobalu Agung	1. Komba-komba 2. Oensuli 3. Wansugi 4. Lupia 5. Lapili Bangka
3. Kontukowuna[2]	1. Kilambibito 2. Bahutara 3. Kontukowuna 4. Kafoofo 5. Lahorio	1. Karo

Region and Model of Plantation Crop-Based Beef Cattle Clusters

The development of beef cattle is integrated with plantation crops which are determined based on regional clusters that have similar conditions and have potential and can be used as a development area for the beef cattle cluster model in Muna Regency. This determination was carried out with various considerations in accordance with the data and information obtained, both data from related agencies and data from field survey results through identification and investigation methods.

Based on the results of the study, four regions for the development of the plantation-based beef cattle cluster model were cluster I, cluster II, cluster III and cluster IV, which were divided based on the geographical location of the region and the proximity between sub-districts.

a. Cluster I area for plantation-based beef cattle.

The area for developing the plantation-based beef cattle cluster model in cluster I is spread over 5 sub-districts, namely Maligano, South Wakorumba, Batukara, Pasir Putih, and Pasikolaga Districts.

1. South Wakorumba district is concentrated in Pure Village and Wambona Village, while the other villages are categorized as buffer villages. The determination of the village area is based on the analysis of the criteria for areas that are considered to have better potential among several villages, by looking at the level of beef cattle population and the potential for coconut and guava plants that have been developed by the local community for a long time. Based on 2019 data, it shows that the beef cattle population in South Wakorumba District reached 1223 heads and a coconut plantation area of 544.49 hectares and cashew nuts covering 961.8 hectares spread across six villages (BPS, 2020)

2. Pasir Putih district consists of six villages with development centers in Bumbu Village and Pola Village, while

Kamonsope, Kogholifano, Labulawa and Liwu Metingki Villages are designated as buffer villages. The population of beef cattle according to 2019 data is 1180 with the type of plantation business, namely coconut and cashew crops and is a mainstay of the community with a coconut plantation area of 269 hectares and a cashew plantation area of 541 hectares (BPS, 2020)

3. Pasi Kolaga district which is centered in Mataindaha, Lambelu, Kolese and Tampunabale Villages. Based on 2019 data, it shows that the beef cattle population reaches 1418 heads. Meanwhile, the results of field observations show that coconut and cashew plants are businesses developed by the people in this area. This plant was developed because it is considered capable of providing added value to farmers' income with a coconut plantation area of 385 hectares and cashew trees covering an area of 370 hectares (BPS, 2020).

4. Maligano is a district with the highest cattle population reaching 2,486 heads, which are concentrated in Pohorua, Maligano and Raemuna villages. The results of identification and field survey obtained information that the dominant types of plants cultivated by the community are coconut and cashew trees. This plant grows and spreads along the coastal coast with an area of 224.29 hectares of land for head crops and 628.9 hectares of cashew nuts, so it is very suitable to be used as a development area for plantation-based beef cattle cluster models.

5. Batukara district, which is centered in Bone-bone, Baluara and Lanobake Villages, with a population level of beef cattle according to 2019 as many as 597 heads. The land for cashew and coconut plantations owned by the community is generally in the form of a fairly wide expanse. The land area for cashew trees in this area is 446.1 ha with a production of 67.5 tonnes, while the land for coconut is 73.13 ha with a production of 380 tonnes (BPS, 2020)

Based on the foregoing, the integrated beef cattle development pattern between beef cattle and plantation crops is expected to increase productivity. Forages that grow under coconut trees and cashew trees can be used as a source of beef cattle feed. This illustrates that the potential for developing beef cattle that is integrated with plantation crops can be implemented. Coconut plantations and cashew nuts can be a source of forage that greatly supports the development of beef cattle, because they can provide benefits for breeders, namely in addition to improving soil fertility through cow dung, as well as a source of feed for livestock from the forage that grows around it.

Table 4. The Distribution of Areas in the Development of a Beef Cattle Cluster Model Based on Plantation in Muna Regency

	District	Central (Cluster) Support Development	Buffer (Hinterland)
1.	Wakorumba Selatan[1]	1. Pure 2. Wambona	1. Bakealu 2. Labunia 3. Wandiri 4. Tolaku
2.	Pasir Putih[1]	1. Pola 2. Bumbu	1. Liwumwtingki 2. Kamosope 3. Kogholifano 4. Labulawa

	District	Central (Cluster) Support Development	Buffer (Hinterland)
3.	Pasi Kolaga[1]	1. Mataindaha 2. Lambelu 3. Kolese 4. Tampunabale	1. Maatempe 2. Lantogalalu
4.	Maligano[1]	1. Pohorua 2. Maligano 3. Raimuna	1. Lapole 2. Latmpa 3. Langkoroni
5.	Batukara[1]	1. Bone-bone 2. Baluara 3. Lanobake	1. Moolo 2. Tangkeno

b. Cluster II area for plantation-based beef cattle.

The area of plantation land in Parigi District reaches 20,074.3 hectares, Bone District reaches 2,383.5 hectares and Marobo District reaches 1,440.2 hectares, with the area of the plantation land that can be a source of food such as field grass, reeds, gamal, centro, and colopo.

1. Parigi district, which is concentrated in the villages of Walambunowite, Kolasa, Wakumoro, Kosundano, La Iba, and Kosumdano. One of the leading plantation potentials in this region is the cashew plantation. According to 2019 data, the land area for cashew nuts reaches 19,220.70 hectares and coconuts in an area of 418.70 hectares with a beef cattle population rate of 7,839 heads and is the second largest population in Muna Regency (BPS, 2020)

2. Bone district which is centered on Bone, Oelongko, Matobura, Bone Limbu and Bone Tondo Villages is one of the areas that has a large enough potential for plantation crops. The leading plantation crops are coconut and cashew plants. According to 2019 data, the area of cashew land in Bone District reached 2,194.90 hectares and coconut plantations reached 77.60 hectares with a population level of beef cattle according to 2019 data of 3,057 heads (BPS, 2020).

3. The same condition also exists in Marobo district which is centered in Paoroha, Marobo and Wadoalo Villages. Marobo Subdistrict has a large potential for plantation crops. The leading plantation crops in this sub-district are coconut and cashew plants. According to 2019 data, the land area for cashew nuts reaches 1,289.90 hectares and coconut plants reach 71.30 hectares with a population of 1,112 beef cattle (BPS, 2020).

Table 5. The Distribution of Areas in the Development of a Beef Cattle Cluster Model Based on Plantation in Muna Regency

	District	Central (Cluster) Support Development	Buffer (Hinterland)
1.	Parigi[1]	1. Walambunowite 2. Kolasa 3. La Iba 4. Wakumoro 5. Kosundano 6. Wasolangka 7. Labulu-bulu 8. Latampu	1. Warambe 2. Parigi 3. Wapuale 4. Katapi 5. Latongku 6. Labalia 7. Latandi Wuna
2.	Bone[1]	1. Bone	1. Matorumba Kanini

No	District	Central (Cluster) Support Development	Buffer (Hinterland)
		2. Oelongko 3. Matombura 4. Bone limbu 5. Bone tondo	2. Oengkalogha
3.	Marobo[1]	1. Paoroha 2. Marobo 3. Wadolao	1. Pasikuta 2. Tapi-Tapi 3. Kasasini Sara 4. Toroh Bungi

c. Cluster III area for plantation-based beef cattle.

The determination of the development area for the plantation-based beef cattle cluster model in cluster III is spread over three sub-districts, namely Tongkuno, Tongkuno Selatan and Lohia Districts. The area of plantation crops in Lohia District reaches 704.9 hectares, Tongkuno District reaches 5,304.5 hectares and South Tongkuno District has an area of 4,183.6 hectares. This condition is one of the bases in determining these areas as models for developing beef cattle clusters based on plantation areas in Muna Regency.

1. Tongkuno district which is centered in Tongkuno Village, Up Wuna, Laloya, Laghontoghe, Tombula, Fongkaniwa and Danagoa Village. According to 2019 data, the land area for cashew trees in Tongkuno District reaches 4,680.10 hectares and deep coconut plants are 424.30 hectares, with a total population of beef cattle reaching 8,718 heads (BPS, 2020)

2. Lohia districts, which are concentrated in Lohia, Mantobua, Lakarinta, Waara and Korihi Villages. According to 2019 data, the land area for cashew trees in Lohia District reaches 4,680.10 hectares and deep coconut plants are 424.30 hectares, with a total population of beef cattle reaching 2,060 heads (BPS, 2020).

3. South Tongkuno district which is concentrated in Labasa, Wale-ale, Lianosa, Katumpu and Kulidawa villages. According to 2019 data, the land area for cashew trees in Tongkuno Selatan District reaches 4,680.10 hectares and deep coconut plants are 424.30 hectares, with a population of beef cattle reaching 2,821 heads (BPS, 2020).

Based on the results of the field survey, it shows that the development of a plantation-based beef cattle cluster model in Tongkuno, South Tongkuno and Lohia Districts is very potential through an integrated pattern of beef cattle with special plantation crops of coconut and cashew crops.

Table 6. The Distribution of Areas in the Development of a Beef Cattle Cluster Model Based on Plantation in Muna Regency

No	District	Central (Cluster) Support Development	Buffer (Hinterland)
1	Tongkuno[1]	1. Danagoa 2. Fongkaniwa 3. Tombula 4. Up Wuna 5. Laghontohe 6. Laloya 7. Tongkuno	1. Lapadindi 2. Tanjung 3. Oempu 4. Matano Oe 5. Lamorende 6. Kontumolepe 7. Lakologou 8. Katano Wuna
2.	Lohia[1]	1. Lohia 2. Mantobua	1. Liangkobori 2. Kondongia

No	District	Central (Cluster) Support Development	Buffer (*Hinterland*)
		3. Lakarinta 4. Wa ara 5. Korihi	3. Loghiya 4. La Wela 5. Kondongia Barat 6. Maabholu
3	South Tongkuno[1]	1. Katumpu 2. Labasa 3. Lianosa 4. Wale-ale 5. Kulidawa	1. Oe Waungka 2. Labasa Selatan 3. Wale-ale Barat

d. Cluster VI area for plantation-based beef cattle.

The distribution of the development area for the plantation-based beef cattle cluster model in cluster IV consists of two districts, namely:

1. Napabalano district is concentrated in Napabalano, Lambiku, Pentiro and Langkumapo Villages. The land area for cashew trees reaches 1,111 hectares and coconut trees reach 177.1 hectares, with a beef cattle population according to BPS in 2018 as many as 5,038 heads.

2. Lasalepa districts are concentrated in La bunti, Parida, Bonea, Labone and Roda and Kombungo villages. The area of cashew plantation in this area is 1,027 hectares and coconut plantation area is 112.6 hectares, with a population of beef cattle reaching 4,936 heads.

Based on the results of the field survey, the average person who owns beef cattle also has cashew and coconut plants. Farmed cattle can be maintained in each plantation area by utilizing the feed around the plantation area. The public perception in running this business is that it can help improve the economy and serve as future savings.

The maintenance of cattle in this area is still done traditionally. Cattle that are released in the plantation area will provide benefits from the aspect of soil fertility through the use of manure as fertilizer. The land area used can be integrated with beef cattle, resulting in a situation of mutualism symbiosis. Based on the research results, from the 4 cluster areas coconut and cashew nuts are the dominant commodities cultivated by farmers. Coconut and cashew plants are export commodity crops that have many benefits, so they can increase people's income.

The livestock sub-sector as part of the agricultural sector can integrate with the agriculture and plantation sub-sector to increase the productivity of each subsector. Farmed livestock can be integrated with agricultural and plantation businesses to complement each other's businesses to provide optimal results (Soeharto, 2000). The use of waste as organic fertilizer for coconut and cashew plants is able to reduce production costs and increase plant productivity. One of the agricultural activities carried out by muna community farmers is the cultivation of coconut and cashew crops, the crop-livestock integration system is an agricultural system characterized by a close relationship between plant and livestock components in a farm or within an area. This linkage is a trigger factor in encouraging income growth of farming communities and regional economic growth in a sustainable manner (Pasandaran et. al., 2005).

Table 7. The Distribution of Areas in the Development of a Beef Cattle Cluster Model Based on Plantation in Muna Regency

District	Central (Cluster) Support Development	Buffer (Hinterland)
1. Napabalano	1. Lambiku 2. Pentiro 3. Langkumapo	1. Mekar Sama 4. Tampo 2. Napabalano
2. Lasalepa	1. La bunti 2. Parida 3. Bonea 4. Labone 5. Roda 6. Kombungo	1. Bangunsari 2. Lasalepa

Development of Pasture Based Beef Cattle Cluster Model

The potential for pasture or grasslands in Watopute District reaches ± 400 hectares, the largest in 9 villages and sub-districts, while in Kontunaga District it reaches ± 10 hectares (BPS, 2020). Based on this potential, it is the main basis for determining the area of Watoputi and Kontunaga Districts as areas for developing a beef cattle cluster model based on grazing areas in Muna Regency. The location of the grazing area of the 2 sub-districts is on a stretch that borders one village with another. The grazing area stretches from the south-southwest part of Watoputi District to be precise in the villages of Matarawa, Lakapodo and Dana, as well as the western part of Kontunaga District to be precise in the villages of Lapodidi, Bungi, Kontunaga, and Liabalano.

Based on the results of the field survey, most of the people in Watoputi sub-district keep beef cattle on a limited basis, where the cattle are released to the pasture area during the day or within 1-2 days and at night they are returned to their pens or tied up near gardens and houses, and a full extensive rearing system, where the cows are released in the grazing fields in the long term. Administratively, this grazing area is directly adjacent to the Matarawa grazing field, so that it has the same regional characteristics, especially in the use of grazing areas, even according to some breeders, it is not uncommon for cattle from Watoputi to enter the grazing area, and vice versa, some cows from Kontunaga District enter the area of the Matarawa grazing area.

According to Bamualim and Wirdahayati (2005), cow productivity in grazing land is generally influenced by the amount and quality of feed. The effect of the dry season has an impact on decreasing the amount and quality of feed in natural pastures so that livestock productivity can decrease, especially in the growth of calves, young cows and breastfeeding cows. The limited ability of parents to raise children during the dry season is the trigger for the high rate of child mortality. Mother and child face a high risk of death from lack of feed. Therefore, to improve the quality of forage in natural pastures, it can be done by adding / planting several species of forage species that have strong roots and are resistant to trampling. Referring to the standards recommended by Crowder and Chheda (1982), the quality of pasture is good if the proportion of pasture is 3: 2 between grass and legume. Sufficient availability of legume in a pasture is needed because legume has a higher nutrient (protein) content than grass.

Table 8. The Distribution of Areas for the Development of the Beef Cattle Cluster Model Based on Grazing in Muna Regency

	District	Central (Cluster) Support Development	Buffer (Hinterland)
1.	Kontunaga[3]	1. Liabalano 2. Kontunaga 3. Lapodidi 4. Bungi	1. Masalili 2. Sungkaghito 3. Teweghu 4. Mabodo
2.	Watopute[3]	1. Matarawa 2. Lakapodo 3. Dana 4. Wakadia	1. Labaha 2. Watopute 3. Bangkali 4. Bangkali Barat 5. Wali 6. Wakadia Barat 7. Dana Timur

Conclusion

Based on the description above, it shows that muna district has the potential to develop the Beef Cattle Cluster Model Area based on food crops, plantations and grazing fields, so the following conclusions can be drawn:

1. Based on the results of the research, there are 4 areas to develop a plantation-based beef cattle cluster model, namely cluster I, cluster II, cluster III and cluster IV, namely:
   a. Cluster I is spread over 5 sub-districts, namely Maligano, South Wakorumba, Batukara, Pasir Putih, and Pasikolaga districts.
   b. Cluster II is spread across three sub-districts, namely Parigi, Bone and Marobo Districts.
   c. Cluster III is spread across three sub-districts, namely Tongkuno, South Tongkuno and Lohia Districts.
   d. Cluster IV consists of two districts, namely Napabalano and Lasal Districts

2. The distribution area for the development of the food crop-based beef cattle cluster model in Muna Regency is in Kabawo, Kabangka and Kontukowuna Districts, which are the three sub-districts that are prioritized in developing the beef cattle cluster model which is supported by the availability of by-products of rice and maize plants that can be processed and utilized to fulfill beef cattle feed needs

3. Areas in Muna Regency that have the potential for developing beef cattle clusters based on the field area Pastoral care is Watoputi and Kontunaga Districts.

REFERENCES

Abadi, M., LD. Nafiu., And Jufri K., 2019. Mapping of Bali Cattle Forage Potential Resources, Tinanggea District, South Konawe Regency. Journal of Tropical Science and Technology. Vol. 6 (1): 124-137.

Abadi M, Surahmanto, Rizal. A., Nasiu. F., and Fatmawati. 2019. The Carrying Capacity Of Crop As Cow And Goat Feed In Muna Barat Regency. Bulletin Of Animal Science. Vol. 43 (3): 151-157

Bamualim A, Wirdahayati RB. 2005. The potential of natural grasslands in Nusa Tenggara for beef cattle production. Proceedings of the National Seminar on the Development of Competitive Animal Husbandry Business in Dry Land. Faculty of Animal Science UGM, Yogyakarta. p. 49 - 56.

BPS, 2020. Muna Regency in Figures 2020. Central Bureau of Statistics of Muna Regency.

Crowder LV, Chheda HR. 1982. Tropical Grassland Husbandry. London (GB): Longman.

Diwyanto K, Priyanti A, Zainuddin D. 1996. Development of Agribusiness-Based Livestock in Rural Areas by Utilizing Agricultural Waste and Selecting the Right Seeds. Journal of Agricultural Research and Development 15 (1): 6-15.

Fariani, A and Evitayani, 2008. Potential of Swamp Grass as Ruminant Feed: Production, Capacity and Content of Fiber Fractions. J.Indon.Trop.Anim.Agric. 33 [4]

Hayanto, B., I. Inounu, Arsana, and K. Dwiyanto, 2002. Rice-Livestock Integration System. Agricultural Research and Development Agency. Ministry of Agriculture, Jakarta.

Hutabarat, T.S.P.N. 2002. Regional Approach in Animal Husbandry Development. Directorate General of Animal Husbandry Production, Ministry of Agriculture. Jakarta. 1-13

Pasandaran E., Djajanegara A., Kariyasa K., and Kasryno F. 2005. Conceptual Framework for Plant-Animal Integration in Indonesia. Crop-Livestock Integration in Indonesia. Agricultural Research and Development Agency. Ministry of Agriculture, Jakarta.

Nell, J. A and D. H. L. Rollinson. 1974. The Requirements and Availability of Livestock Feed in Indonesia, Jakarta

Priyanto, D. 2011. Cattle and Buffalo Farming Development Strategies in Supporting the 2014 PSDS. Journal of Agricultural Research and Development, Animal Research Center, Bogor. 30 (3): 108-116.

Ron Hood, 1998. Economic Analysis: A Location Quotient. Primary. Principal Sun Region Associates, Inc

Rukmana HR. 2005. Superior Grass: Forage Forage. Yogyakarta (ID): Kanisius

Rustiadi E and Panuju DR. 2012. Technical Analysis of Regional Development Planning. Bogor (ID): Regional Development Planning Section of the Department of Soil and Land Resources, Bogor Agricultural University.

Singarimbun, M. and E. Sofian. 1995. Survey Research Methods. LP3ES. Jakarta.

Soeharto, 2000. The concept of integrated agriculture embodies success with independence. Paper presented as training material "Revitalization of integrated livestock business in farming systems in Bogor and Solo 21 February - 6 March 2000.

Surahmanto, F. Trisakti Haryadi and Sumadi. 2014. The performance of agricultural extension agents as a source of information, facilitators, and assistants in achieving the Bali Cattle (Bos sondaicus) development program in Muna Regency, Southeast Sulawesi Province. Animal Husbandry Bulletin Vol. 38 (2): 116-124.

Thalib, C. 2002. Bali cattle in the area of seed sources and opportunities for their development. Wartazoa 12: 100-107.

The Potential of Developing Beef Cattle Cluster Model Based on Food Crops and Plantation and Grazing in Muna Regency

9   Edy Humaidi, I Putu Ajie Windu Kertayoga, Analianasari. "Preparation of a Map of Leading Food Commodities in the Lampung Province Using the Location Quotient (LQ) Method", IOP Conference Series: Earth and Environmental Science, 2022
Publication

<1 %

10   Submitted to Universitas Negeri Semarang
Student Paper

<1 %

11   E Mirwandhono, Hasnudi, E H Kardhinata. "Study of potential of plantation and agriculture waste as feed for support the development of cattle population in district along east coast of Sumatera Utara province", IOP Conference Series: Earth and Environmental Science, 2022
Publication

<1 %

12   "Proceedings of the 5th International Conference on Sustainable Civil Engineering Structures and Construction Materials", Springer Science and Business Media LLC, 2022
Publication

<1 %

13   journal.untar.ac.id
Internet Source

<1 %

14   www.uho.ac.id
Internet Source

<1 %

15   Lu'ulul Amna, Matheus Sariubang, Andi Nurhayu. "Increasing production of integration system of corn and beef cattle in Gowa, South Sulawesi", E3S Web of Conferences, 2021
Publication

<1 %

Exclude quotes   On   Exclude matches   Off
Exclude bibliography   On

The Potential of Developing Beef Cattle Cluster Model Based on Food Crops and Plantation and Grazing in Muna Regency

FINAL GRADE

/0

GENERAL COMMENTS

Instructor

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7

PAGE 8

PAGE 9

PAGE 10

PAGE 11

PAGE 12

PAGE 13