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Opportunities and Challenges for Development of Buffalo Livestock in North Musi Rawas Regency, South Sumatra Province

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Abstract: This study aims to analyze the potential development of buffalo in North Musi Rawas Regency and analyze the inhibiting factors of the development of buffalo in North Musi Rawas Regency. This research is qualitative descriptive. The data used are primary data and secondary data by survey method through interviews and direct observation. This research was carried out in 2 (two) stages: (1) identification and analysis of the potential for development of buffaloes in North Musi Rawas Regency, and (2) analysis of buffalo livestock business in the central area. The results showed that the North Musi Rawas Regency had the potential for future development of buffalo livestock, supported by (a) geographical location suitable for buffaloes, (b) institutional facilities supporting the development of buffaloes, (c) increasing demand for buffalo livestock products especially meat (d) a unique buffalo livestock raising system by applying local local wisdom, (e) the existence of buffalo livestock development centers in three sub-districts namely Ulu Rawas sub-district, Rupit sub-district, and Rawas Ulu sub-district, and (f) Capacity Building for Animal Development Buffalo Ruminants (KPPTR-KB) based on land resources and group workforce of 17,020.4 ST can still be maximized for the development of buffalo livestock. While the challenge of developing buffalo livestock in North Musi Rawas Regency is caused by a) conversion of farmland, b) slaughtering of productive females buffalo, c) reproductive and health problems of livestock, d) environmental security disturbances, e) semi-intensive livestock raising systems, and f) low bargaining position in selling livestock products.
Keywords: opportunity, challenge, development, buffalo, descriptive analysis.

INTRODUCTION

Research Background

The existence of buffalo livestock since it was formerly inseparable from rural communities in North Musi Rawas Regency. This is due to the fact that buffalo livestock is used as labor, a source of income, is also a source of animal protein that is preferred by the community because of its more elastic meat structure compared to beef [1]. Even on certain days or events such as religious or marriage events, buffalo meat is a mandatory menu for some people in North Musi Rawas Regency so that at that time the demand for buffalo meat is quite high. The productivity of buffalo that comes from traditional maintenance by the farming community has the purpose of working animals, sources of meat, organic fertilizer, and complementary religious events, plays an important role in the productivity of buffaloes nationwide.

The population of buffaloes in North Musi Rawas Regency is ranked third in the Province of South Sumatra, although for the last 5 years the average decline has been 19.8% / year or decreased by 21 tails / year (down 106 tails during the period 2012-2016). This quite worrying rate of decline should be a concern for the regional government so that in the long run the predicate as a center for buffalo production can be maintained. Efforts to stop the region-specific local livestock depletion process which is related to the cultural patterns of local communities requires a strategy to be more programmed and effective in its implementation.

In general, buffaloes are kept by the people of North Musi Rawas Regency as savings and side businesses, while the main business community is in the agricultural and plantation sectors. Farmers maintain traditionally with local wisdom. The local wisdom of the community in maintaining buffalo livestock is done by picket system, where buffaloes are released and grazed in the morning by a group of picket breeders, then in the afternoon the cattle are repelled again. This method has been carried out from generation to generation by farmers and is still maintained until now [1]. The issue of increasingly sharp land use competition will become a serious problem; the fact shows that, competition in land use has an unfavorable impact on the livestock sub-sector. Livestock areas are not infrequently forced to be sacrificed because of the demand for the land for the development of certain

sectors such as industry and settlements, which have a greater chance of obtaining short-term benefits [2].

Badan Pusat Statistik Musi Rawas [3] states that the total area of North Musi Rawas Regency is 600,865.51 Ha. Land use in North Musi Rawas Regency is mostly used as non-rice field agricultural land, which reaches 48.45 percent of the total land area. 21.75 percent of them are plantation land, both owned and managed by the people and by the company. Meanwhile, the land used for rice fields is only 0.97 percent of the total area of North Musi Rawas Regency. Based on this, the authors are interested in conducting research activities with the title "Opportunities and Challenges of Buffalo Animal Development in North Musi Rawas Regency, South Sumatra Province".

Research Problem

Some problems that can be formulated include:

- How is the potential development of buffaloes in North Musi Rawas Regency
- What are the factors that inhibit the development of buffalo in North Musi Rawas Regency

Research Purposes

This study aims to:

- Analyzing the potential for development of buffalo in North Musi Rawas Regency.
- Analyzing problems that can inhibit the development of buffaloes in North Musi Rawas Regency

The results of this study are expected to be a guide for stakeholders and policy makers for the development of buffaloes in North Musi Rawas Regency, which has the potential of national meat supply in the future through an overview of the centers and regions supporting development, the current condition of buffalo livestock maintained at the farmer level in the central region, and formulated a strategy for developing buffalo livestock in the North Musi Rawas Regency.

METHODS

Place and Time Research

This research was carried out in North Musi Rawas Regency, South Sumatra Province. The location of the study was conducted deliberately with the consideration that North Musi Rawas Regency is one of the centers of buffalo production in South Sumatra which has recently experienced a drastic decline of population. Field data collection is carried out for approximately 2 (two) months in August and September 2018.

Research Methods

The research method uses survey methods. This research was carried out in 2 stages: The first stage was to identify and analyze the potential for the development of buffalo in North Musi Rawas Regency; and second stage, analysis of buffalo livestock business in the development center area.

Fisrt Stage; identify and analyze the potential for the development of buffalo in North Musi Rawas Regency

The study aims to identify and analyze the potential for development of buffaloes in North Musi Rawas Regency. The data used in the form of secondary data comes from BPS, Dinas Pertanian dan Perikanan, Dinas Ketahanan Pangan, BAPPEDA Kabupaten Musi Rawas Utara, and other relevant agencies.

Research Variable

The research variables at this stage are: 1) General condition of the region consisting of; area, geographical location, topography and soil type, agricultural land use, climate and rainfall; 2) Community livelihoods; 3) Institutions and supporting facilities for the development of buffalo livestock businesses; 4) The buffalo livestock development program that has been carried out by the government; 5) Population of buffalo and ruminants (ST) in each Sub-district; 6) Population (people) in each Sub- district; 7) Contribution of land in producing forages based on planting area; and Sub-district contributions in generating waste based on harvested area.

Data Analysis

Some of the analyzes used include: 1) Descriptive Analysis: Descriptive analysis is carried out on the general conditions of the region, the main livelihoods of the population, institutional and supporting facilities, the development programs that have been carried out are presented in tables, images and graphs and compared with theories and literature that support research this; 2) Location Quation Analysis (LQ): Used to determine the buffalo center area in North Musi Rawas Regency; 3) Carrying Capacity Analysis Location: Analysis of location suitability is carried out by looking at the capacity of the buffalo cattle development area in North Musi Rawas Regency. For this reason, the calculation of the Capacity of Cattle Population Improvement Capacity (KPPTS) refers to the method of Nell and Rollison [4] at Arfa'i [2], which calculates the capacity of ruminant animals.

Stage Two; Analysis of The Business of Buffalo Cattle in The Central Region

The aim of the study was to analyze the business of buffalo cattle in the buffalo center area in North Musi Rawas Regency, using survey and observation methods.

Based on the results of the phase one study, the research location was determined in three sub-districts namely; (1) Ulu Rawas sub-district, (2) Rupit sub-district, and (3) Rawas Ulu sub-district. The study used a survey method, through interviews and location observation based on questionnaires.

Research Respondents

The number of respondents was set at 98 respondents who spread in the central region using the Slovin Formula.

Research Variable

The research variables at this stage are: 1) Breeders' characteristics consist of age, education level, main occupation, number of family members, number of livestock raised, experience in farming; 2) Breeders' Motivation and Behavior. Motivation consists of the purpose and reasons for doing buffalo cattle business, and breeders' behavior in the form of knowledge, attitudes and skills in doing business in buffalo cattle; 3) Technical aspects of buffalo livestock business which consist of seeds that are maintained, feed, management of maintenance, prevention / treatment of diseases, and marketing.

Data Analysis

The analysis used is in the form of: 1) Descriptive Analysis: Data on farmer characteristics, technical aspects of buffalo business, and available labor are analyzed descriptively. Availability of labor based on the Farmer Household (RTP) of the buffalo business and the ability to maintain buffalo (TKSP / TH); 2) Mann-Whitney and Kruskal Wallis Test.

RESULTS AND DISCUSSION

Opportunities for the Development of Buffalo Cattle in North Musi Rawas Regency

Regional Geographical Position

Geographically, Musi Rawas Utara Regency is located between 102 ° 4'0 " BT-103 ° 22'13 'BT and 2 ° 19'15' LS-3 ° 6'30 'LS. The topography of the region starts from the coastal area to the hilly area and passes through a number of rivers, the condition of a minimum temperature of 19 ° C and a maximum temperature of 38 ° C, average rainfall of 222 mm^3 / month located at an altitude of 75 - 125 m above sea level, in part large population livelihoods in agriculture including livestock (81.37%) [3]. this condition is very potential for the development of buffalo cattle business in the future.

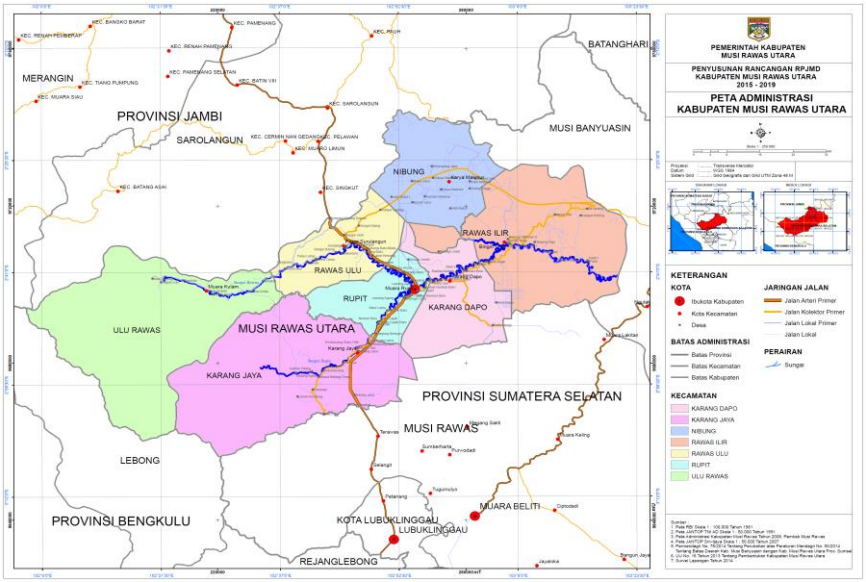

Fig-1: Administrative Map of North Musi Rawas Regency

Supporting Institution Facility

Buffalo Farmers Group

There are 20 buffalo farmer groups in North Musi Rawas Regency which are dominated by the buffalo livestock development centers, which consist of 5 farmer groups in Rawas Ulu Sub-district, 3 farmer groups in Ulu Rawas Sub-district and 4 farmer groups in Rupit Sub-district. But in addition to the central region there are also buffalo farmer groups which are 3 groups in Karangjaya Sub-district, 3 groups in Rawas Ilir Sub-district, and 2 groups in Karangdapo Sub-district whereas in Nibung Sub-district there are no buffalo farmer groups. The number of buffalo farmer groups is one of the strength factors to support the development of buffalo in North Musi Rawas Regency.

Center for Animal Health (Puskeswan)

In the research area, Puskeswan is an animal health service unit for the community. There are 2 Puskeswan units namely Region I Puskeswan in Karangjaya sub-district whose working area includes Rupit, Karangjaya, Karangdapo and Rawas Ilir Subdistricts. Region II Puskeswan in Rawas Ulu sub-district whose working area covers Rawas Ulu, Ulu Rawas and Nibung Sub-district. Animal health services that can be obtained include examinations, treatment, and vaccination of livestock and pets, recommendations of being bitten by rabies suspect animals and animal health education. The existence of Puskeswan in the center of buffalo livestock development is very supportive for the development of buffalo cattle.

Agricultural Extension Center

The Agricultural Counseling Center which is a learning forum for farmers and agribusiness communities where meetings between extension agents and farmers are held every two weeks in each sub-district. The number of extension centers is 7 units in all sub-districts in North Musi Rawas Regency. Then the livestock extension agent is the spearhead of the success of the development of 8 extension agent with a scientific basis for livestock. They make visits and disseminate information on technology to farmers to change the attitudes and behavior of farmers.

Increased Demand for Buffalo Animal Products

The buffalo business has never been separated from the rural community in North Musi Rawas Regency. This is due to buffalo livestock besides being used as labor, a source of income, also a source of animal protein which is preferred by the community because the structure of the meat is more elastic than beef [1]. Even on certain days or events such as religious or wedding events, buffalo meat is a menu that must be served to some people in the North Musi Rawas Regency so that at that time the demand for buffalo meat is quite high. Then there is the tendency of modern society to back to nature, especially traditionally raised livestock, so that exotic foods such as buffalo meat which have low fat content have very large potential as export commodities to several developed countries [1].

Local Wisdom in the Livestock System

Breeders maintain buffalo in the North Musi Rawas Regency in a semi-intensive manner, ie livestock are released day and night is locked up. The buffalo cattle are released from 7:00 a.m. until 5:00 p.m. Farmers maintain traditionally with local wisdom. The local wisdom of the community in maintaining buffalo livestock is carried out in a picket system, where the buffalo cattle are released in the morning and grazed by a group of picket farmers, then in the afternoon the cattle are restocked. This method has been carried out for generations by farmers and is still maintained today [1].

The Buffalo Development Center in North Musi Rawas Regency

The results showed that there were 3 (three) centers of buffalo livestock business in North Musi Rawas Regency from 7 (seven) existing sub-districts, namely Ulu Rawas, Rupit, and Rawas Ulu sub-districts. This illustrates that the buffalo development center in North Musi Rawas Regency is in these 3 (three) regions. The Location Quation value of the buffalo livestock development center in North Musi Rawas Regency is presented in Table 1.

Table-1: The Buffalo Development Center in North Musi Rawas Regency

No	Sub-District	LQ Value
1	Ulu Rawas	2,8178
2	Rupit	1,6032
3	Rawas Ulu	1,4682

Source : Results of research (2018)

Daryanto and Hafizrianda [5] state that Location Quotient is an indicator that can show the size of the role of a sector in an area compared to other sectors.

Livestock Capacity

The capacity values of each sub-district in North Musi Rawas Regency are presented in Table 2.

Table-2:The capacity values of each sub-district in North Musi Rawas Regency

No	Sub-District	KPPTR (ST)	KPPTR Buffalo (ST)	Development Level
1	Ulu Rawas	11.051,3	6.023,0	High
2	Karangjaya	6.965,9	3.796,4	High
3	Rawas Ilir	5.779,1	3.149,6	High
4	Rawas Ulu	3.797,1	2.069,4	High
5	Rupit	1.316,1	717,3	Medium
6	Nibung	1.300,0	708,5	Medium
7	Karangdapo	1.300,0	556,3	Medium
	Total	31.230,2	17.020,4	

Source : Results of research (2018)

The results showed that the value of increasing capacity of buffalo livestock (KPPTR-KB) in the area of North Musi Rawas Regency was 17,020.4 ST. The availability of feed resources comes from the contribution of pasture / grassland, marginal land, agricultural land and from crop agricultural waste.

Challenges for the Development of Buffalo Cattle in North Musi Rawas Regency

Conversion of Farmland

Conversion of farmland in North Musi Rawas Regency in 2017 is mostly used as mixed plantations, covering an area of 3,516.47 km² or 57.99% of the total land area of the regency and spread throughout the sub-districts. Built land for settlements is only 33.91 km² or 0.56%. Meanwhile, 1,731.24 km² or 28.81% of land in the North Musi Rawas Regency are still in the form of forests, both protected forests and secondary dryland forests.

Conversion of farmland usually occurs from paddy fields or moor land into residential areas and the shifting of pasture pasture land into oil palm or rubber plantations so that the availability of fodder for buffaloes decreases. Kusnadi *et al.* [6] Stated that the decline in buffalo population was thought to be caused by reduced function and role of buffalo in farming systems and reduced land both as farmer and land cultivation.

High Level Slaughting of Productive Females Buffalo

Based on the results of the study as seen in Table 3, the mortality rate of buffalo children is quite high while the birth rate is low due to the large number of cutting high productive female buffalo at the study site.

Table-3: Productivity of buffalo in the research area

No	Criteria	Breeder
1	Age of mating first (Month)	40 Month
2	Birth Interval (Month)	18 Month
3	Calving rate (%)	5,01
4	Mortality rate (%)	50,48
5	Slaugter of Female Buffalo (average)	61 each/year

Source : Results of research (2018)

One of the factors causing low buffalo population is due to the availability of superior seeds, low-quality animal feed, cross-breeding and lack of knowledge of farmers in handling livestock production and reproduction [7]. In addition, other problems that are the basis of the development of buffalo are very slow, namely traditional maintenance patterns, reduced grazing land, high rates of male slaughter which have an impact on male deficiency, slaughter of productive female buffalo, the high mortality rate of buffalo children, low productivity, limited semi-maintenance system development, and a negative impression of buffalo.

Reproductive Disorders and Animal Health

Types of reproductive disorders and health of buffaloes in the area of buffalo development in North Musi Rawas Utara Regency can be seen in Table 4.

Table-4: Types of disease in the buffalo livestock development center

No	Types of disease	Respondents	Percentage (%)
1	Bloating	21	21,4
2	Worms	32	32,6
3	Paralysis	16	16,3
4	Poisoning	7	7,2
5	Lack of appetite	22	22,5
	Total	98	100

Source : Results of research (2018)

Based on the results of research on disease prevention, sanitation and the environment carried out and vaccinated. The disease that attacks buffalo is intestinal worms by 32.6%, bloating (bloating) by 21.4%, paralysis by 16.3% and poisoning by 7.2%. While the remaining 22.5% buffalo only experienced lethargy or lack of appetite. Poisoning that occurs is usually caused by eating animals carelessly. Paralysis in livestock usually occurs due to and lack of minerals.

Prevention and treatment of diseases is carried out through sanitary and environmental pens, livestock will be susceptible to disease if the management is not good. Parasites and diseases usually develop well in animals that are in poor condition and can spread to other healthy livestock. Usually when cattle are sick, farmers traditionally treat herbs naturally. If the animal does not recover, the farmer calls the paramedics. The Livestock and Fisheries Service provides free vaccines for farmers, SE vaccine, and worm treatment is carried out every 6 months by veterinary paramedics.

Environmental Safety Disorders

The intended environmental security disturbances are such as the high rate of cattle theft and the presence of unscrupulous traders in one location intentionally spreading putas poison mixed with salt in the grasslands so that the buffalo cattle are sick. The

goal is for farmers to sell cheap prices to the perpetrators. They usually collaborate with local criminals.

Breeders find it increasingly uncomfortable to develop buffaloes because of theft, this has caused a variety of negative excesses that have driven the development of buffalo cattle that are worse and have a significant negative impact on this livestock population. If farmers feel uncomfortable raising livestock, the first cattle sold are men. Therefore the most immediate impact seen is a decrease in birth rates due to male difficulties [1].

Semi intensive livestock raising system

The management in the buffalo livestock development center can be seen in Table 5 and Figure 2.

Table-5: Maintenance of buffalo in North Musi Rawas Regency

No	Maintenance management	Sub-district Research Area			Total Respondent	(%)
		Ulu Rawas	Rupit	Rawas Ulu		
1	Maintenance system					
	• Semi intensive	36	25	37	98	100
2	Cage building					
	• wooden cage and ground floor	36	25	37	98	100
3	Cage equipment					
	• Feed place	36	25	37	98	100
	• Drink place	36	25	37	98	100
	• Heating	36	25	37	98	100
4	Cage clean					
	• Every day	2	3	7	12	12,
	• Weekly	34	23	30	86	2
						87,
						8

Source : Results of research (2018)

The buffaloes that are kept in a semi-intensive livestock raising system are released in the morning and evening at cage. The buffalo cattle are released from 7:00 a.m. until 05:00 p.m. the buffalo cage building is made of wood or bamboo that surrounds the entire enclosure and the floor is as seen in (Figure 2). Cages are rarely cleaned, and cage equipment consists of a place to feed, drink, heat the room and place dirt. According to Dirjen Peternakan [10], semi-intensive maintenance is maintenance of livestock which during the day are grazed in grazing land, then at night are strung. This semi-intensive maintenance is widely applied to buffalo farming farmers in Indonesia. Traditional maintenance of buffaloes generally tends to overlook good housing.

Fig-2: Cage building for buffaloes

Low bargaining position of breeders

The results of the study can be seen in Table 6 which shows that respondents in the study area sold buffaloes in two ways, namely buffalo that were brought directly by farmers to the livestock market and the sale of buffaloes through collectors who came to the stable. Respondents from Ulu Rawas sub-district made direct livestock sales in the livestock market at 2.7%,

and through livestock collectors 97.2%. Rupit Sub-district all respondents were sold through cattle collectors, while in Rawas Ulu Sub-district direct sales to livestock markets were 5.4% and through livestock collectors were 94.6%. In general the respondents sell through livestock collectors.

Table-6: Marketing of Buffalo Livestock Products in the Research Area

No	How to market buffalo cattle	Sub-district Research Area		
		Ulu Rawas (%)	Rupit (%)	Rawas Ulu (%)
1	directly to the livestock market	2,7	-	5,4
2	sold through cattle collectors	97,2	100	94,6
3	through livestock groups	-	-	-

Source : Results of research (2018)

Marketing of buffalo cattle still uses collection services. This is due to the location of livestock markets that are far from their agricultural location (central area), and the institutional functions of groups in the marketing sector are still not functioning. Determination of the sale value of livestock based on the estimated weight of the meat, in determining the price of the bargaining position of farmers is still weak, so the dominant selling price is determined by traders, and payments made by traders are always not cash (installments between 3-4 payments). Apart from livestock collectors, livestock sales are also carried out directly to the livestock market, and through group roles. Basyid [8] states that problems in marketing buffaloes include a lack of facilities such as livestock markets and government policies in regulating livestock marketing.

Buffalo Animal Development Program

Buffalo Animal Development Program di North Musi Rawas Regency can be seen in Table 7.

Table-7: Buffalo Animal Development Program di North Musi Rawas Regency

No	Program type	Activity type	Information
1	Livestock disease prevention and prevention program	a. Health care and prevention of livestock infectious diseases	Vaccination and treatment of livestock
2	Program to increase livestock production	a. Development of Support and Infrastructure Facilities for Livestock	Construction of a fence around the location of the buffalo enclosure in Muara Rupit
		b. Distribution of livestock seeds to the community	
3	Livestock production marketing improvement program	a. Construction of market facilities and infrastructure for livestock production	Plans to make slaughterhouses
4	Programs to improve the application of livestock technology	a. Training and guidance on the proper operation of livestock technology	Training on Inseminator
		b. Procurement of facilities and infrastructure for artificial insemination technology	Means of Artificial Insemination Post
		c. People's Ranch Center (SPR)	Field School

Source : Dispertanikan Muratara, 2017

From Table 7, the programs implemented in North Musi Rawas Regency in developing buffalo livestock registered in office planning are 1) livestock disease prevention and prevention program, 2) Program to increase livestock production, 3) Livestock production marketing improvement program and 4) programs to improve the application of livestock technology.

Programs to prevent infectious diseases are carried out by medical and veterinary paramedics and assisted by livestock instructors. This program is implemented in all sub-districts in Musi Rawas Utara District, whose activities include inspection, treatment, sampling and vaccination of livestock and pets, recommendations of animals suspected of being infected with rabies and animal health education.

The current program to increase livestock production is an activity to strengthen the support of UPSUS SIWAB (Special Mandatory Parent Efforts) is a national program launched by the Ministry of Agriculture of the Republic of Indonesia through the Directorate General of Animal Husbandry and Health implemented by the Livestock Service / Agency in the regions Assistant Assistance Fund. This activity aims to increase the livestock population by increasing the birth of cattle / buffalo. North Musi Rawas Regency as a buffer zone for the UPSUS SIWAB program began its activities in 2017 by preparing infrastructure facilities

such as artificial insemination post, frozen cement, liquid N2, containers, strawgun, inseminator officers and veterinary paramedics.

Then the construction of livestock facilities and infrastructure in the Muara Rupit Buffalo Livestock Group in Rupit Subdistrict is the construction of mobile wire fences on clan land for cages for buffalo cattle and buffalo grazing fields and planting forage types of elephant grass and gamal leaves. This movable wire fence serves to prevent buffalo from roaming to residential areas and offices because Rupit District is the district capital.

Sjafrijal [9] states that development programs are basically actions / interventions by the government to be able to implement policies that have been taken in order to realize the vision and mission of the regional development in question. While activities are details of the development program for each aspect of the implementation of a particular program in a location. To be able to create good and appropriate programs and activities so that they can encourage the regional development process, planning documents must be made, namely the SKPD Strategic Plan.

CONCLUSIONS

Based on the results obtained can be concluded as follows:

- The area of North Musi Rawas Regency has the potential of developing buffalo livestock supported by (a) geographical location suitable for buffaloes, (b) institutional facilities supporting the development of buffalo livestock, (c) increasing demand for buffalo cattle products, especially meat (d) a unique buffalo cattle rearing system by applying local wisdom, (e) the presence of buffalo livestock development centers in three sub-districts, namely Ulu Rawas Sub-district, Rupit Sub-district, and Rawas Ulu Sub-district, and (f) Capacity Building for Animal Development Buffalo Ruminants (KPPTR-KB) based on land resources and group labor of 17,020.4 ST can still be maximized for the development of buffalo livestock.
- Challenges to development buffalo livestock in North Musi Rawas Regency caused by a) conversion of livestock land, b) slaughtering of productive females buffalo, c) reproductive disorders and health of livestock, d) disruption of environmental security, e) semi-intensive livestock raising systems and f) low bargaining position in selling livestock products.

RECOMMENDATIONS

To accelerate the development of sustainable buffaloes in Musi Rawas Utara District, a number of things are recommended :

- Make regulations on the allocation of livestock land,
- Overcoming reproductive disorders and animal health,
- Make a center for animal husbandry,
- Overcoming environmental security problems, and
- Optimizing the functions of institutions and existing supporting facilities.

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