

# Study of prospects for livestock development through the integration of oil palm plantations – cattle (SISKA KU INTIP Program) as a support of meat in the new capital city (Case study in Kotabaru District, South Kalimantan)

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**Abstract.** This study aims to 1) Assess and map the potential, prospects, opportunities and challenges of the development pattern of integration of oil palm – cattle livestock in oil palm plantations (Siskaku intip), 2) Identification, inventory and nutritional testing of potential grass and leguminous species in oil palm plantations, 3) Simulation of the contribution of the number of livestock and meat supply with the integration model of oil palm plantations and cattle for the province of South Kalimantan and the candidate for the new state capital in IKN, 4) Formulate policy strategies and model recommendations in the development of integration of oil palm-cattle plantations in oil palm plantations in Kotabaru District. The study case study was carried out in Kotabaru District, South Kalimantan, in the four sub-districts with the largest population of cattle including Kec. Kelumpang Hilir, Kelumpang Hulu, Kelumpang Barat and Hampang. The results showed that based on the analysis of LQ, LI and SI in the Hampang sub-district the superior livestock were free-range cattle and chicken, in the Kelumpang Hulu sub-district were cattle, goats and free-range chicken, in the West Kelumpang sub-district were free-range cattle and chicken, and in the Hampang sub-district were cattle and chicken free range.

## 1 Introduction

The potential for livestock development in oil palm plantation areas in Indonesia was introduced and developed in 2014 with the promulgation of Minister of Agriculture Regulation Number 105/Permentan/PD.300/8/2014 concerning Integration of Oil Palm Plantation Businesses with Beef Cattle Cultivation [1]. Priyanto [2] said that the integration of the oil palm – cattle business is an effort to unify the plantation business with the livestock farming business, especially beef cattle on oil palm plantation land. Cattle farming with an integrated pattern can provide positive socio-cultural and economic impacts [3]. The

Province of South Kalimantan is starting to seriously develop the integration of oil palm – cattle starting in 2021. In that year, South Kalimantan Governor Regulation No. 053 of 2021 concerning the Acceleration of Self-Sufficiency in Beef Cattle through the Integration of Oil Palm-Cattle Based on Nucleus-Plasma Livestock Business Partnerships. This effort is also in the context of accelerating beef cattle self-sufficiency through the SISKU INTIP Program developed by the government through the South Kalimantan Provincial Plantation and Livestock Service which is expected to be achieved in 2024. This is considering that South Kalimantan is the gateway to the new national capital (IKN). Another benefit of the program is the effort to provide beef at an economical (cheap) cost, because it utilizes natural grass in oil palm plantations and feed produced from palm oil industrial waste. For Kotabaru District the Siska Ku Intip cluster is carried out by PT Eagle High Plantations Tbk (Saka Kencana Sejahtera) with an area of 2,000 ha of oil palm plantations and a total of 250 cows, where the village cluster is still at the stage of the identification and SID (survey) process.

Syamsu [4] stated that the oil palm–cow integration system is very beneficial because livestock can utilize grasses, legumes and forages that grow naturally in oil palm plantation areas or palm oil processing industry waste as feed. Sitompul [5], reported that besides livestock producing livestock manure it is used as organic fertilizer to improve soil fertility. According to Riady [6], many livestock practitioners report that as an alternative to animal feed, oil palm plantations have great potential as "distributors" of feed ingredients for the development of ruminant livestock, namely cattle. This good prospect can be a solution in efforts to increase the efficiency of the oil palm plantation business, as well as a bridge for the realization of business development programs in the community through support for livestock production businesses around the plantation area [7, 8]. However, the implementation of the system has not run as it should. Since its launch, there has been little interest from oil palm plantation companies to get involved in it [9, 10] reporting that several problems arise as a result and can cause losses if management is carried out in an inappropriate manner. Management must be based on the characteristics of the two commodities.

Economically, the oil palm – cattle integration system is able to reduce the use of chemical fertilizers, considering that the fertilizers given to oil palm plants are generally limited to chemical fertilizers only [11]. Even though the application of chemical fertilizers (an organic) in the long term will cause physical and chemical damage as well as soil biology which will affect the continuity of the production of the oil palm plant itself [12]. While cow dung is a potential source of organic matter, it plays a good role in soil fertility [13]. Physically it can improve the structure, texture and porosity of the soil so that the roots of the oil palm plants can develop well and are able to increase the absorption of soil nutrients [14]. In the end, the development of integration of oil palm - cattle has multiple benefits besides providing meat from livestock cultivation, several other benefits include: a) providing solid organic fertilizer in the form of cattle business waste to meet the needs of palm oil fertilizer, b) utilizing oil palm plantation waste, especially palm fronds as a source of animal feed, and c) to assist local governments and IKN in the future in supplying beef cattle [2, 15, 16].

The aims of the research are: 1) Assessing and mapping the potential, prospects, opportunities and challenges of the integration pattern of development of oil palm – cattle livestock in oil palm plantations, 2) Identification, inventory and nutritional testing of potential grass species in oil palm plantations, 3) Mapping potential livestock based on LQ, LI and SI, 4) Producing a map of the distribution of superior livestock in Kotabaru, 5) Formulating a development model for the optimal pattern of integration of oil palm plantations - cattle, 6) Generating a policy formulation for developing a model for oil palm-cow integration, and 7) Formulating a livestock development strategy oil palm-cattle integration system in oil palm plantations in Kotabaru District.

2 Research methods

The research was carried out in Kotabaru District, starting from the preparation to the report which lasted for 8 months, with the stages below (Figure 1).

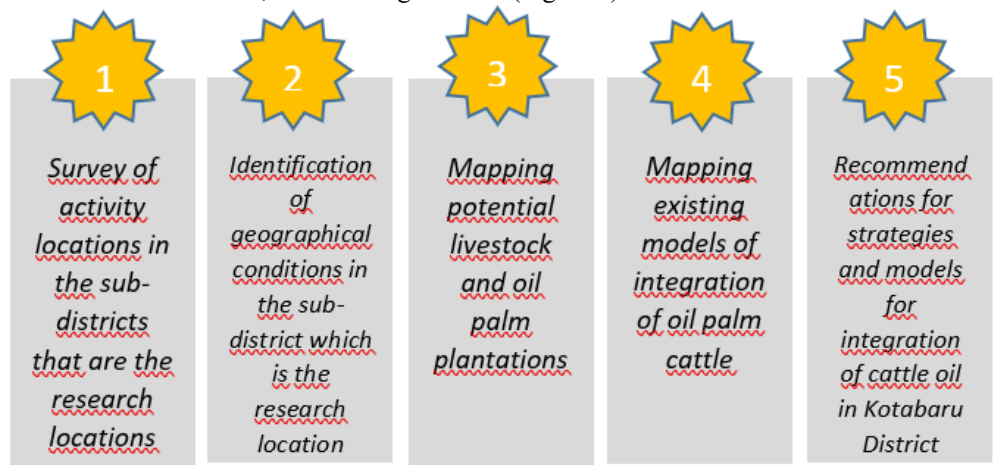


Fig. 1. Stages of research implementation.

2.1 Data collection

2.1.1 Primary data collection

The stages of data collection are needed to obtain data in fulfilling the variables or subject of study. Primary data collection was carried out by interviewing related respondents (breeders, PPL, Agriculture Service, Bappeda) referring to the Ministry of Agriculture [17] regarding Guidelines for the development of oil-cattle integration and field studies with the aim of obtaining the latest data and information that is accurate and valid for updating the existing data in secondary data. Methods of data collection Primary data collection techniques are carried out in several ways.

2.1.2 Secondary data collection

Secondary data collection was carried out through literature studies and secondary data obtained from various related agencies (Bappeda, BPS, Food Security Service, Agriculture Service). Literature study aims to get an initial picture of the current conditions in the research study area.

3 Data analysis

The data analysis techniques used are LQ, LI, SI, and SWOT analysis.

### 3.1 Mapping potential livestock based on LQ, LI and SI Analysis (3rd, 4th and 5th objectives)

#### 3.1.1 Location quotient (LQ)

LQ analysis in the livestock sector, is one of the quantitative analyzes used to analyze the potential for livestock development in an area based on the concentration of a certain type of livestock population in one area. The adjusted LQ formula based on Darmawan [18] is as follows:

$$LQ = \frac{X_{ij} / X_i}{X_{.j} / X_{..}} \quad (1)$$

**Note:** ( $X_{ij}$ ) : Livestock population  $i$  in the district  $j$ ; ( $X_i$ ) : Total livestock population in the district  $j$ ; ( $X_{.j}$ ): Livestock population  $i$  in the district area; and ( $X_{..}$ ); Total livestock population in the district area.

The LQ value  $> 1$  indicates that there is a concentration of livestock business activities in the sub-region relatively compared to the total area or there is a concentration of livestock population in the  $i$ -th sub-region. This means that in this situation a livestock in an area has a very important role. The value of  $LQ < 1$  indicates that there is no concentration or concentration of certain livestock populations in sub-region  $i$ .

#### 3.1.2 Analysis of localization index (LI)

LI is a quantitative analysis to determine the role of each type of livestock in the sub-district compared to the role of similar livestock in the district, which describes the level of distribution of the livestock population in an area. The formula for calculating the value of LI refers to Darmawan [18] is as follows:

$$LI = 1/2 \sum_{i=1}^n \left| \frac{X_{ij}}{X_{.j}} - \frac{X_i}{X_{..}} \right| \quad (2)$$

**Note:** ( $X_{ij}$ ) : Livestock population  $i$  in the district  $j$ ; ( $X_i$ ) : Total livestock population in the district  $j$ ; ( $X_{.j}$ ): livestock population  $i$  in the district area; and ( $X_{..}$ ); Total livestock population in the district area.

LI values that are close to 1 mean that there is concentration of population in the observed area. Conversely, if the LI value is close to 0, it means that the distribution of the population tends to be evenly distributed in all observed sub-regions, and can be used as a form of livestock population mapping so that livestock development planning can be planned appropriately.

#### 3.1.3 Specialization index (SI) analysis

Unlike the Location Quotient (LQ) and Localization Index (LI), the Specialization Index (SI) is a method used to find out the division of areas based on the specificity of activity in a district, to determine the level of livestock specificity in a region. Specialization Index (SI) refers to Darmawan [18] as follows:

$$SI = 1 / 2 \sum \left\{ \frac{X_{ij}}{X_{i.}} - \frac{X_{.j}}{X_{..}} \right\}$$

(3)

**Note:** (X<sub>ij</sub>): Livestock population i in the district j; (X<sub>i.</sub>) :Total livestock population in the district j; (X<sub>.j</sub>): Livestock population i in the district area; and (X<sub>..</sub>); Total livestock population in the district area.

The SI value that is close to 0 means that there is no uniqueness. This means that the observed sub-region does not have relatively prominent typical activities, while the SI value that is getting closer to 1 means that there are activities that are unique to the region and are more prominent than other sub-regions of the observed area.

3.2 Identification, inventory and nutritional testing of potential grass species in oil palm plantations

Proximate AOAC analysis of forage nutrition (grass & leguminosae) results of inventory and identification in oil palm plantation areas

3.3 SWOT analysis

The strategy formulation technique developed by Rangkuti [19] was carried out through 3 (three) implementation stages using the matrix as the analysis model. The three stages of the framework in question are the input stage (the input store), the matching stage, and the decision stage. The results of the SWOT analysis can be used to offer alternative strategies for formulating superior or priority programs in developing potential livestock in oil palm plantation areas in Kotabaru District. Alternative SWOT matrix strategies can provide a good picture of how the external opportunities and threats faced can be eliminated and suppressed through the existence of strength factors and suppressing weaknesses through optimizing existing opportunities. The SWOT matrix as a matching instrument is capable of developing four strategies including SO, WO, ST and WT.

4 Results and discussion

4.1 Mapping the distribution of leading livestock potential based on LQ, LI and SI

Mapping and distribution of livestock in the research study area is able to explain the development of livestock types according to their potential, presented in Table 1.

**Table 1.** Mapping of the distribution of livestock potential based on LQ, LI and SI in the Districts of Hampang, West Kelumpang, Kelumpang Hulu and Kelumpang Hilir Kab. New city.

| No | Subdistrict   | Livestock Type     | Population*)<br>(tail) | LQ   | LI      | SI     |
|----|---------------|--------------------|------------------------|------|---------|--------|
| 1  | Hampang       | 1. Cattle          | 351                    | 1,44 | 0,0049  | 0,087  |
|    |               | 2. Buffalo         | 27                     | 0,71 | -0,0093 | -0,009 |
|    |               | 3. Goat            | 229                    | 0,71 | -0,0778 | -0,078 |
|    |               | 4. Broiler         | 800                    | 0,14 | -0,0461 | -0,046 |
|    |               | 5. Ducks           | 454                    | 0,17 | -0,0198 | -0,019 |
|    |               | 6. Kampong chicken | 53.918                 | 1,17 | 0,0732  | 0,073  |
| 2  | KelumpangHulu | 1. Cattle          | 442                    | 1,04 | 0,0007  | 0,007  |
|    |               | 2. Buffalo         | 30                     | 0,46 | -0,0174 | -0,017 |

|   |                 |                    |        |      |         |        |
|---|-----------------|--------------------|--------|------|---------|--------|
|   |                 | 3. Goat            | 589    | 1,04 | 0,0111  | 0,011  |
|   |                 | 4. Broiler         | 0      | 0,00 | -0,0534 | -0,053 |
|   |                 | 5. Ducks           | 0      | 0,00 | -0,0239 | -0,023 |
|   |                 | 6. Kampung chicken | 2.380  | 1,18 | 0,0773  | 0,077  |
|   | KelumpangBarat  | 1. Cattle          | 205    | 0,88 | -0,0013 | -0,024 |
|   |                 | 2. Buffalo         | 62     | 1,70 | 0,0221  | 0,022  |
|   |                 | 3. Goat            | 311    | 1,01 | 0,0026  | 0,003  |
|   |                 | 4. Broiler         | 2.000  | 0,50 | -0,0269 | -0,026 |
|   |                 | 5. Ducks           | 326    | 0,18 | -0,0196 | -0,019 |
|   |                 | 6. Kampung chicken | 17.699 | 1,18 | 0,0193  | 0,019  |
| 4 | Kelumpang Hilir | 1. Cattle          | 1.256  | 1,40 | 0,0164  | 0,080  |
|   |                 | 2. Buffalo         | 27     | 0,19 | -0,0255 | -0,025 |
|   |                 | 3. Goat            | 949    | 0,80 | -0,0539 | -0,053 |
|   |                 | 4. Broiler         | 0      | 0,22 | -0,0417 | -0,041 |
|   |                 | 5. Ducks           | 295    | 0,14 | -0,0205 | -0,020 |
|   |                 | 6. Kampung chicken | 41.303 | 1,15 | 0,0621  | 0,062  |

Note : \*) BPS Kotabaru [20]  
Source: Primary data processed (2022)

For ruminants, beef cattle development base areas are in 4 sub-districts, both Hampang, Kelumpang Hulu, Kelumpang Barat and Kelumpang Hilir with LQ values  $\geq 1$ ; for goats, the potential is in Kelumpang Hulu and West Kelumpang Districts; for buffalo the base area is in West Kelumpang District. According to Budiharsono [21] if the LQ value of a sector is  $\geq 1$ , then the sector is a base sector, whereas if the LQ value of a sector is less than 1 ( $<1$ ), then the sector is non-base. LQ types of livestock in the 4 Districts of Hampang and District of Kelumpang are presented in Table 2.

**Table 2.** Areas of livestock development base with LQ values  $\geq 1$  in four sub-districts in Kotabaru District.

| No | Subdistrict     | Livestock Type      | LQ value | Region Category |
|----|-----------------|---------------------|----------|-----------------|
| 1  | Hampang         | 1. Cattle           | 1,44     | Base Region     |
|    |                 | 2. Kampung chickens | 1,17     |                 |
| 2  | Kelumpang Hulu  | 1. Cattle           | 1,04     | Base Region     |
|    |                 | 2. Goat             | 1,04     | Base Region     |
|    |                 | 3. Kampung chicken  | 1,18     | Base Region     |
| 3  | Kelumpang Barat | 1. Cattle           | 1,70     | Base Region     |
|    |                 | 2. Goat             | 1,01     | Base Region     |
|    |                 | 3. Kampung chicken  | 1,05     | Base Region     |
| 4  | Kelumpang Hilir | 1. Cattle           | 1,40     | Base Region     |
|    |                 | 2. Kampung chickens | 1,15     | Base Region     |

Source: Processed Primary Data (2022)

Meanwhile, the analysis for the LI (localization index) value shows that the concentration of beef cattle occurred in Kelumpang Hilir District with an LI value of 0.016, the concentration of buffalo cattle occurred in West Kelumpang District with an LI value of 0.02, and the goat livestock concentrated in Kelumpang Hulu District is equal to the LI value of 0.01. As for the analysis of the specialization index (SI) value, typical cattle in Hampang and Kelumpang Hilir Districts are cattle with an SI value of 0.08 each, Kelumpang Hulu District typical livestock are goats of 0.01, and West Kelumpang District is typical livestock is a buffalo with an SI of 0.02.

4.2 Identification, inventory and nutritional testing of potential grass species in oil palm plantations

Proximate AOAC analysis of forage nutrition tests (grass and legumes) from inventory and identification results in oil palm plantation areas is presented in Table 3 below.

Table 3. Nutritional analysis of grass and legume samples found in the oil palm plantation area.

| No          | Forage Type                                  | Nutrient Content (%) |                   |               |      |                  |
|-------------|----------------------------------------------|----------------------|-------------------|---------------|------|------------------|
|             |                                              | Moisture content     | Dry Material (DM) | Proteins (CP) | Fat  | Crude Fiber (CF) |
| A. Grass:   |                                              |                      |                   |               |      |                  |
| 1           | <i>Paspalum conjugatum</i> <sup>1)</sup>     | 61,43                | 38,57             | 14,02         | 0,76 | 11,22            |
| 2           | <i>Brachiaria mutica</i> <sup>1)</sup>       | 67,22                | 32,73             | 14,85         | 0,37 | 8,1              |
| 3           | <i>Athyrium filix-femina</i> ) <sup>2)</sup> | 79,26                | 20,74             | 11,91         | 0,25 | 8,33             |
| 4           | <i>Pennisetum purpureum</i> <sup>1)</sup>    | 81,10                | 18,90             | 17,26         | 1,30 | 24,15            |
| 5           | <i>Cyperus kylingia</i>                      | 76,88                | 23,12             | 10,66         | 0,6  | 6,72             |
| B. Legumes: |                                              |                      |                   |               |      |                  |
| 6           | <i>Borreria latifolia</i> <sup>2)</sup>      | 77,3                 | 22,7              | 13,64         | 0,27 | 5,01             |
| 7           | <i>Centrosema pubescens</i> <sup>1)</sup>    | 79,13                | 20,87             | 17,44         | 0,55 | 17,26            |
| 8           | <i>Calopogonium mucunoides</i> <sup>1)</sup> | 75,55                | 24,45             | 12,55         | 0,36 | 11,67            |
| 9           | <i>Mimosa pudica</i> Linn) <sup>1)</sup>     | 48,23                | 51,77             | 8,33          | 0,67 | 12,4             |
| 10          | <i>Ageratum conyzoides</i> <sup>2)</sup>     | 81,66                | 18,34             | 16,28         | 0,53 | 7,15             |
| 11          | <i>Mucuna bracteata</i> <sup>2)</sup>        | 13,28                | 86,72             | 18,04         | 1,62 | 32,88            |

Notes: <sup>1)</sup> Animal Feed and Nutrition laboratory analysis, Faperta ULM, 2022

The forage potential found is very abundant in oil palm plantation areas with a variety of grasses and legumes. The results of observation and sampling found 11 plants consisting of 5 types of grass and 6 types of leguminosae in grazing land and oil palm plantation areas. Some of them are highly preferred by cattle and goats because they are quite palatable and of good quality and nutritious, such as elephant grass, malela grass, legume mucuna, legume centrocema pubescens and legume bandotan. This becomes the carrying capacity of forage in the oil palm-livestock integration system [22].

4.3 Formulation of policy and model in the palm oil-cow integration development pattern

Support in the form of government policies to support the development of oil palm-cattle integration with the issuance of two (2) regulations, namely (1) Minister of Agriculture No. 105/Permentan/PD.300/8/2014 concerning Integration of Oil Palm Plantation Businesses with Beef Cattle Cultivation Businesses, and (2) Governor Regulations (PerGub) regarding

integration of oil palm-cattle. Governor of South Kalimantan Regulation No. 053 of 2021 concerning the Acceleration of Self-Sufficiency in Beef Cattle through the Integration of Oil Palm-Cattle Based on Nucleus-Plasma Livestock Business Partnerships (Siska Ku Peek).

Based on the results of observations and the suitability of models that have been implemented naturally by breeders in independent oil palm plantations (smallholder oil palm plantations) as well as integration models that have begun to be introduced and developed in Kotabaru District, there are three (3) choices of models in the development pattern of Palm Oil Integration Cows that can be applied as an option through options, are:

#### *4.3.1 Integration model 1 : Intensive cultivation patterns*

This cultivation pattern is carried out by keeping cows continuously on oil palm plantations. The feeding system for cattle is carried out using a cut and carry system, in which the forage (grass and legumes) is cut (diarit) in the oil palm plantation area, and brought to the barn to be given to the cattle.

#### *4.3.2 Integration model 1 : Semi-intensive cultivation patterns*

This cultivation pattern is carried out by grazing cattle in a controlled manner from morning to evening on oil palm plantations.

#### *4.3.3 Integration model 3 : Extensive cultivation patterns*

This cultivation pattern is carried out by grazing cattle in a controlled manner throughout the day on oil palm plantations by rotating with an interval of at least 60 (sixty) days.

The system of feeding cattle in oil palm plantation areas is recommended through two feeding systems, namely: ***The cut and carry system*** is a way of providing livestock feed where forage in the form of grass and legumes is cut from the area around the pen and brought to the pen to feed the livestock. Livestock growth varies greatly depending on the adequacy of the amount of forage given and the nutritional quality of the forage. Breeders must be diligent in slicing forage and looking for good quality forage, if it is neglected, the body weight of the livestock, both cows and goats, will be low and vice versa. ***Livestock Grazing System*** is a method of providing animal feed by grazing cattle and goats in grazing areas such as pastures, fields, fields or areas of oil palm plantations or rubber plantations. Generally according to observations in the 4 sub-districts of the research study area in the sub-districts of Hampang, Kelumpang Hulu, Kelumpang Barat and Kelumpang Hilir. This second system is the most widely applied by cattle breeders.

### **4.4 Livestock development strategy for palm-cattle integration systems in oil palm plantations**

The results of the SWOT analysis for the formulation of livestock development strategies in the integration of cattle oil, presented in Table 4.

The strategy for livestock development in potential oil palm plantation areas is cattle, carried out with the pattern of developing an oil palm-cow integration system, through two strategies, namely:

1. **The short term strategy (5 years)** includes (1) scaling up the livestock population through the development of the oil palm-livestock integration model area (cattles, goats), (2) socialization of the benefits of the oil palm-livestock integration model



with oil palm companies, (3) establishment corporations or farmer-breeder associations to prevent livestock slaughter and marketing monopoly, (4) Mainstreaming of ideal livestock farming (cow-goat) patterns based on local resources and oil palm plantations, and (5) Development of forage feed science and technology and palm oil processing industrial waste.

2. **The Medium Term Strategy (6 – 10 years)** includes (1) Establishing a livestock market or expanding livestock market access as well as increasing online marketing capabilities for breeders and breaking the long and difficult market distribution chain, (2) Development of slaughterhouses under the supervision of the Department of Agriculture, (3) Increasing the competence of human resources to increase productivity, added value and welfare of farmers and breeders, (4) Management of livestock health and biosecurity at the farmer level, (5) Placement of veterinarians/veterinary staff at each Poskeswan, (6) Technical guidance for improvement knowledge/skills of PPL personnel, (7) Provision of livestock business credit and access to livestock capital to increase business scale.

**Table 4.** SWOT matrix for the analysis of the integration strategy for cattle oil in Kotabaru District.

| <div>Internal factors</div> <div>External factors</div>                                                                                                                                                                                                                           | <b>STRENGTHS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>WEAKNESSES</b>                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                   | <div>1. Extensive cattle grazing land in oil palm plantation areas (community and private plantations)</div> <div>2. Abundance of forage forage (grass, legumes) and palm oil processing industry waste</div> <div>3. The land for raising livestock is still wide</div> <div>4. There are quite a lot of superior livestock populations, namely cattle, goats in Pamukan District</div> <div>5. Farming skills are good</div>                                                                                                        | <div>1. The role and function of PPL in the livestock sector is not optimal.</div> <div>2. Limited business capital breeders</div> <div>3. Community knowledge about integration of mustard greens with livestock is lacking</div> <div>4. Supporting facilities for livestock development are still lacking (IB service post, Poskeswan, Poultry Shop, RPH).</div> <div>5. There is cattle theft in oil palm plantations</div> |
| <b>OPPORTUNITIES</b>                                                                                                                                                                                                                                                              | <b>STRATEGI S – O</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>STRATEGI W – O</b>                                                                                                                                                                                                                                                                                                                                                                                                           |
| <div>1. The South Kalimantan Governor's Regulation regarding integration of palm oil</div> <div>2. The high demand for beef and mutton</div> <div>3. Prices for cows and goats are high</div> <div>4. There are superior livestock of cattle and goats in several districts</div> | <div>1. Increasing the competence of human resources to increase productivity, added value and welfare of farmers and breeders</div> <div>2. Scale up livestock through the development of the oil palm-livestock integration model area (cows, goats).</div> <div>3. Socialization of the benefits of the integration model of oil palm-livestock plantations with oil palm companies</div> <div>4. Scale up the livestock population through the development of the oil palm-livestock integration model area (cattle, goats)</div> | <div>1. Technical guidance to increase the knowledge/skills of PPL personnel</div> <div>2. Provision of livestock business credit and access to livestock capital to increase business scale.</div>                                                                                                                                                                                                                             |

| THREATS                                                                                                                                                                                                                                    | STRATEGIS – T                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | STRATEGI W – T                                                                                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. There is a monopoly on cattle slaughtering and marketing<br>2. The market distribution chain that is difficult for the community to penetrate<br>3. the threat of livestock disease requires serious treatment. (worms, bloating, skin) | 1. Establishment of corporations or associations of farmers/breeders to prevent monopoly on livestock slaughter and marketing<br>2. Mainstreaming ideal livestock (cattle, goat) cultivation patterns based on local resources and oil palm plantations.<br>3. RPH development under the supervision of the Department of Agriculture<br>4. Management of livestock health and biosecurity at the farmer level<br>5. Placement of veterinarians/veterinary staff at each Poskeswan | 1. Establishing livestock markets or expanding access to livestock markets as well as increasing online marketing capabilities for breeders and breaking the long and difficult market distribution chain |

4.5 Contribution to the provision of meat stock in the national capital IKN

Based on data on the cattle population in 2021, it can be seen that as a whole, South Kalimantan still has a beef shortage of 3,903,141 kg or the equivalent of 25,000 cows. This deficit can mainly be covered by the cattle population in Kotabaru with the potential for oil palm-cow integration. supported by the area of oil palm plantations in Kotabaru Regency which has the most extensive record in the province of South Kalimantan reaching 155,813 ha or the equivalent of 27.5% of the area of oil palm plantations in South Kalimantan. Referring to regulation No. 105/Permentan/PD.300/8/2014 concerning "Integration of Oil Palm Plantation Businesses with Beef Cattle Cultivation Businesses" wherein 1 ha of grazing land in oil palm plantations will be able to accommodate 2 cows, then with an area of oil palm plantations in Kotabaru (155,813 ha) its contribution reached 23,494 head (ST) and the province of South Kalimantan (565,712 ha) the contribution of the oil palm-cattle integration program reached 1,131,424 head (ST) as shown in Table 5 and Table 6. This production was able to meet the deficit both in South Kalimantan with contribution reached 4,425% above the cattle deficit, and sufficient for East Kalimantan's deficit to reach 2,089% above East Kalimantan's cattle deficit.

Table 5. South Kalimantan and East Kalimantan meat production deficit (new IKN) in 2021.

| No. | Description     | East Kalimantan |                          | South Kalimantan |                          |
|-----|-----------------|-----------------|--------------------------|------------------|--------------------------|
|     |                 | meat (kg)       | Cattle equivalent (tail) | meat (kg)        | Cattle equivalent (tail) |
| 1   | Meat demand     | 9.812.810       | 62.852                   | 6.900.000        | 52.000                   |
| 2   | Meat Supply     | 1.743.299       | 11.166                   | 4.215.392        | 27.000                   |
| 3   | Deficit of meat | 8.069.510       | 51.686                   | 3.903.141        | 25.000                   |

Source: Processed primary data (2022)

Thus the oil palm-cow integration program in South Kalimantan using the Kotabaru Regency model will be able to provide self-sufficiency in cattle in South Kalimantan and also

as a buffer and sufficiency for the needs of cattle in the New State Capital at the East Kalimantan IKN, as expected.

**Table 6.** Estimated contribution of cattle-oil integration in the study area in Kotabaru District based on the area of oil palm plantations on the availability of cattle.

| No | Description                                                                                                     | Oil palm plantation area (ha) | Carryng Capacity (tail) | Meat Equivalent (kg) |
|----|-----------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------|----------------------|
| A  | Kotabaru District (13 District /cities)                                                                         | 565.712                       | 1.131.424               | 169.713.600          |
| B  | Four sub-districts in Kotabaru were research locations (Kelumpang Hulu, Kelumpang Barat, Kelumpang Hilir)       | 11.747                        | 23.494                  | 3.524.100            |
| C  | Deficit of meat in South Kalimantan                                                                             |                               | 25.000                  | 8.069.510            |
| D  | Deficit of meat in East Kalimantan (New IKN)                                                                    |                               | 51.686                  | 3.903.141            |
| E  | Estimated contribution of the Palm-Cattle Integration Program to the meat deficit for South Kalimantan          | 4.425 %                       |                         |                      |
| F  | Estimated contribution of the Palm-Cattle Integration Program to the meat deficit for East Kalimantan (New IKN) | 2.089 %                       |                         |                      |

Source: Processed primary data (2022)

5 Conclusion

1. Cattle development areas, development bases with LQ LQ values  $\geq 1$  are found in 4 sub-districts, both Hampang, Kelumpang Hulu, Kelumpang Barat and Kelumpang Hilir, for the LI value that the concentration of cattle occurs in Kelumpang Hilir District with a LI value of 0.016, while for analysis of the SI value of typical cattle in Hampang and Kelumpang Hilir Districts each of 0.08. Forage potential in the oil palm plantation area with quite a large variety of grasses and legumes, found 11 plants consisting of 5 types of grasses and 6 types of leguminosae in the oil palm plantations. Some of them are highly preferred by cattle and goats because they are quite palatable and of good quality and nutritious, such as elephant grass, *Brachiaria mutica* grass, legume *bracteata*, legume *centrocema pubescens* and legume *Ageratum conyzoides* .
  - a. Integration model 1: Intensive cultivation pattern
  - b. Integration model 2: Semi-intensive cultivation pattern
  - c. Integration model 3 : Extensive cultivation pattern
2. There are three models for the pattern of development of oil palm-cow integration that are recommended as an option, namely:
3. The strategy for livestock development in potential oil palm plantation areas is cattle carried out with the pattern of developing an oil palm-cow integration system, through two strategies, namely:
  - a. **The short term strategy (5 years)** includes (1) scaling up the livestock population through the development of the oil palm-cow integration model area, (2) socializing the benefits of the oil palm-cow plantation integration model with oil palm companies, (3) establishing a corporation or farmer-breeder association to preventing monopoly on livestock slaughtering and marketing, (4) Mainstreaming ideal cattle farming patterns based on local resources and oil palm plantations, and

(5) Developing science and technology for forage feed and palm oil processing industry waste.

**b. The Medium Term Strategy (6 – 10 years)** includes (1) Establishing a livestock market or expanding access to the livestock market as well as increasing online marketing capabilities for breeders and breaking the long and difficult market distribution chain, (2) Development of slaughterhouses under the supervision of the Department of Agriculture, (3 ) Increasing the competence of human resources to increase productivity, added value and welfare of farmers and breeders, (4) Management of livestock health and biosecurity at the farmer level, (5) Placement of veterinarians/veterinary staff at each Poskeswan, (6) Technical guidance for increasing knowledge/ skills of PPL workers, (7) Provision of livestock business credit and access to livestock capital to increase business scale.

4. Referring to regulation No. 105/Permentan/PD.300/8/2014, wherein 1 ha of grazing land in oil palm plantations will be able to accommodate 2 cows, then with an area of oil palm plantations in Kotabaru (155,813 ha) its contribution reached 23,494 head (ST) and the province of South Kalimantan (565,712 ha) the contribution of the oil palm-cattle integration program reached 1,131,424 head (ST). This production was able to meet the deficit both in South Kalimantan with contribution reached 4,425% above the cattle deficit, and sufficient for East Kalimantan's deficit to reach 2,089% above East Kalimantan's cattle deficit.

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