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Beef cattle farming potential in the coconut plantation companies lands in South Minahasa Regency, Indonesia

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Abstract— *This study aims to determine the carrying capacity and profitability of developing beef cattle farming in the coconut land hold by coconut plantation companies. The research was conducted using a survey method on tenant farmers of coconut land that are managed by plantation companies, both state company and private companies holding land use rights (HGU) for coconut plantations. Data that are observed and measured in the field based on the results of interviews with respondents, as well as secondary data from related agencies. The analytical methods used are carrying capacity and profit predicted analysis. The results of the study were concluded as follows: (1) Potential carrying capacity of forage for cattle in coconut plantation company land has an average of 5.28 AU (Animal Unit) of cattles, while on average ownership of cattle only 2.06 AU of cattles each tenant farmer in coconut land that are managed by plantation companies, so that the number of cattle ownerships can still be increased by about 3.22 AU. Tenant farmers of coconut plantation companies land have the potential for the availability of forage on cultivated coconut land owned by coconut plantation companies, so that they can still increase the number of cattle kept.*

Keywords— ***Beef cattle, cattle ownerships, Cultivation Rights.***

I. INTRODUCTION

Indonesia has several potential resources, including natural resources to develop location-specific beef cattle farming. One of the resources for the development of forage is the coconut plantation area, which can be managed with the coconut-beef cattle integrated farming system (coco-beef IFS).

North Sulawesi Province determines coconut as one of the leading and potential commodities, and nationally, the province accounts for around 9% of production national coconut, but coconut's contribution to revenue area is still low (Yusuf et al., 2020). The area of coconut plantation land for both smallholder plantations and plantation companies in North Sulawesi is around 270 thousand hectares (Marbun, 2014). North Sulawesi has a state-owned plantation company (BUMN) namely PTP Nusantara XIV (or PTPN XIV) and several privately owned plantation companies that hold land use rights (HGU) for coconut plantations.

Most of the coconut land areas are cultivated in monoculture, even though they have the potential for integration with beef cattle (Polakitan, 2012, Osak et al., 2018 and Osak et al., 2020) for planting various kinds of superior forage. Quantity and quality of forage in the tropics fluctuates especially during the dry season resulting in a decrease in the level of productivity of cattle with low levels of growth (Osak et al., 2020). For this reason, it is necessary to research the carrying capacity and profitality of beef cattle farming in the coconut plantation companies land in South Minahasa which is very potential to increase the population of cattle in the context of food security from beef cattle.

The research aims to obtain the following results: (1) the potential for the development of forage crops in coconut fields belonging to coconut plantation companies;

and (2) profitability or potential profit from developing beef cattle farming in coconut areas controlled by coconut plantation companies in South Minahasa.

II. MATERIALS AND METHOD

This research was conducted on sharecroppers on coconut plantation companies in North Sulawesi Province, Indonesia where the regency that had the largest coconut plantation area and the largest population of cattle was selected, namely South Minahasa Regency.

The data used are primary data from sharecroppers who raise cattle on land areas under the control of coconut plantation companies that have Cultivation Rights (HGU). The economic valuation method uses primary data, namely data obtained from direct observation in the field, using in-depth interviews with respondents based on questionnaires that have been prepared according to the objective of the study (Hidayatullah, *et al*., 2011). Data were analyzed using Microsoft Excel.

III. RESULT AND DISCUSSION

The potential carrying capacity of coconut land is studied based on carrying capacity in coconut land for cattle, namely the maximum number of animal units (AU) of cattle that can be supported or served by feed resources in an area of coconut land. Forage feed is one of the important factors in efforts to maintain and increase the productivity of cattle. In addition to having a big influence on livestock productivity, feed is also the biggest cost in raising livestock. The main driver was feed, which may account for 60%-70% of total livestock production costs (Becker, 2008). Therefore, the quality and availability (stocking) must be continuously available so that it can meet the basic needs of life, production and reproduction. The adequacy of the availability of fodder for cattle that is kept is a quite serious challenge in the development of livestock in Indonesia. An indication of a shortage of feed supply is the low level of cattle production, both in terms of population and production, so that beef and feeder imports are still dominant.

The availability of forage sources as the main feed for cattle ruminants has recently been increasingly limited. This is due to reduced land for forage production due to the conversion of land use for food purposes and residential areas. In North Sulawesi, cut and carry superior forages were not commonly used, whereas in this area only natural pasture vegetation was used, of which only about 30% was edible for livestock. Cow (Kaligis and C. Sumolang, 1991, Kaligis et al 1996). For this reason, the effectiveness of alternative land use for forage crops needs to be increased, where one of the alternative lands is coconut plantation land.

Table 1. Capacity and potential for raising cattle in coconut plantations by sample villages

No	Sample Village Name	Average grazing area (ha/farmer)	Average Cattle Animal Unit (AU)	Average Capacity (AU/Year)	Average Development Potential (AU)
1.	Pungkol Village Tatapaan Subdistrict	0,76	2,19	4,08	1,89
2.	Ongkaw Village Sinonsayang Subdistrict	0,61	1,58	6,32	4,74
3.	Blongko Village Sinonsayang Subdistrict	0,64	2,19	3,80	1,61
4.	Tiniawangko Village Sinonsayang Subdistrict	0,67	2,30	6,93	4,63
	Average	0,67	2,06	5,28	3,22

The capacity to accommodate cattle in the coconut area and the availability of forage forage used by cattle breeders in coconut plantation company land can be seen in Table 1, which shows that overall the sample cattle breeders have an average of only 2.06 AU of beef cattle, while the average On average, it has a capacity to accommodate 5.28 AU of beef cattle on coconut land.

This showed that coconut land tenant farmers have the potential to provide forage forage under coconut trees land owned by coconut plantation companies, so that they can still increase the number of cattle units kept by

around 3.22 AU of beef cattle or an increase of about 56.31 percent. These results indicated that the sample tenant farmers of coconut land that are managed by plantation companies have the potential to provide forage in the cultivated coconut land owned by the coconut plantation companies, so that they can still increase the number of cattle units kept.

This potential will be further increased through the introduction of superior shade-tolerant forage plants under coconut trees such as dwarf elephant grass and the legume Indigofera sp. will increase the carrying capacity and production of cattle. Carrying capacity of natural pasture, including coconut plantations in North Sulawesi, was only 1-2 AU (animal unit) per hectare, whereas with the introduction of innovative superior feed crops it could reach greater than 20 AU (Paat and Taulu, 2012) so it has the potential to increase around 15.88 AU of beef cattle or an increase of about 770.87 percent, if land use in coconut plantations is increased by planting a variety of superior forages, both grass and legumes that are shade tolerant, such as elephant grass cv. Mot. and ruzi (Brachiaria ruziziensis) and the legume Indigofera sp. (Osak et al., 2022).

The potential for increasing the capacity to accommodate beef cattle will increase the population and production of cattle as a food source of animal protein which is needed by the consumer community, and increase the income of farmer-breeder households and the economy.

IV. CONCLUSION

1) The average ownership of beef cattle by tenant farmers or cultivators on the lands of coconut plantation companies is 2.06 AU, while the holding capacity of cattle on their cultivated land can reach 5.28 AU so that the number can still increase by around 3.22 AU Beef cattle are grazed on coconut plantation company land, and predicted that potential around 15.88 AU of beef cattle or an increase of about 770.87 percent, if land use in coconut plantations is increased by planting a variety of superior forages, both grass and legumes that are shade tolerant
2) The potential for the development of cattle on coconut plantations will be further increased, if through the introduction of superior forage crops that are shade tolerant under coconut trees such as elephant grass cv. Mot. and ruzi (Brachiaria ruziziensis) and the legume Indigofera sp.. akan meningkatkan kapasitas tampung dan produksi ternak sapi.

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