RESEARCH ARTICLE

CHARACTERISTICS OF SHEEP BREEDERS AND THE CONTRIBUTION OF THE CONCEPT OF LIVESTOCK INTEGRATION TO THE INCOME OF SHEEP IN SECANGGANG DISTRICT, LANGKAT REGENCY

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Manuscript Info	Abstract
	……………………………………………………………… The long-term objective of the study is to determine the extent to which the characteristics of sheep breeders and the contribution of livestock integration to the income of sheep breeders in Secanggang District, Langkat Regency. The specific target in this study is to see the characteristics of sheep breeders and the contribution of livestock integration to income. The integration of livestock and plants is one of the livestock cultivation activities, which is the application of an integrated business between plant commodities and livestock (sheep) commodities that utilize agricultural potential as livestock integration, both in the form of livestock waste and agricultural production activities such as picking their own agricultural products. The concept of livestock and crop integration that is often applied by sheep breeders in Secanggang District, Kab.Langkat is the concept of sheep farming with food crop cultivation. From this livestock and crop integration activity, farmers will get additional income from both the sheep farming business and the food crop business. Organic matter that can increase soil fertility. Therefore, it is necessary to research how big the contribution of this concept of livestock integration to the income of the sheep farmer family is. Not all sheep breeders apply the concept of integration, there are also sheep breeders who choose only sheep farming. So it is necessary to analyze the characteristics of breeders such as those who apply the concept of integration of livestock with plants.

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Introduction:-
The livestock sub-sector which until now is still one of the activities in the implementation of development must be a priority scale, because by promoting this business it will overcome the shortage of animal protein needs. Improving the quality of Indonesian human resources, who are able to think creatively in their work, will only be achieved if our society has fulfilled protein needs (especially animal protein). Thus, both the whole community as farmers, investors and especially for local governments as policy makers in development, must act together for the welfare of their nation (Ali, et al, 2012). Sheep are one of the livestock that have become an important part of the farming system in rural areas. The concept of an integrated agricultural system is an agricultural concept that can be developed for limited or large agricultural land. In limited land or narrow land owned by farmers, this concept is generally very appropriate to be developed with a land intensification pattern. Narrow land will provide maximum

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production without any wasted waste. Meanwhile, for a wider area of land, this concept will be a solution to develop more profitable agribusiness agriculture. Through this integrated system, it will be beneficial for land use efficiency, production optimization, waste utilization, cross subsidies to anticipate market price fluctuations and production sustainability (Bangun, 2005). Secanggang District is one of the areas in Langkat Regency which has an important role in the community's economy towards the agricultural sector. Where this area has a potential area with the availability of forage as animal feed which is very large so that it is quite potential for the development of sheep.Secanggang District is a district with a sheep population which annually experiences a significant increase in sheep population when compared to other sub-districts in Langkat Regency, the sheep population data in 2019 in Secanggang District is 26,677 (Department of Agriculture and Food Security, Langkat Regency 2019). Secanggang District is one of the sub-districts located in Langkat Regency, North Sumatra Province. Secanggang District is located between north latitude 03046'17" - 03057'30" and east longitude 98027'45"- 98039'40". With an area of 231.19 Km2. Secanggang sub-district in the north is directly adjacent to the Malacca Strait, in the south it is bordered by Stabat sub-district, while in the west it is bordered by Hinai sub-district and also TanjungPura sub-district, and in the east it borders Deli Serdang Regency. (Secanggang District in Figures 2020).

Material And Methods:-

Research Location and Time
The location of the research was carried out purposively (deliberately) namely in Secanggang District, Langkat Regency because it is one of the districts which is the center of sheep farming. Judging from the sheep population, the population in the sub-district continues to increase every year. This research was conducted in October 2021 – January 2022.

Data collection technique
The data used is primary data collected by using a questionnaire (questionnaire) given to farmers who apply the integration of sheep with agricultural crops. Secondary data is obtained from various related agencies. The population is taken from breeders who apply the concept of integration of sheep in their business. The sample uses non-probability sampling, namely purposive sampling as many as 60 samples.

Data analysis method
The analysis used in this research is descriptive qualitative analysis and income analysis.

Qualitative Descriptive Analysis
Qualitative descriptive analysis is used to look at the characteristics of farmers to get a clear picture of the problem being studied. The characteristics of farmers can be grouped into three parts, namely demographic characteristics, socio-economic characteristics and socio-cultural characteristics (Agunggunanto, 2011). Demographic characteristics are divided into age, education and number of dependents of the family. Socio-economic characteristics consist of land area, income while socio-cultural characteristics consist of farmers' livelihoods and institutions (Salikin. 2003). Developed**.**

Income Analysis
Farmer/breeder income analysis is calculated by adding up income from non-agricultural/animal husbandry activities, livestock activities with cattle insurance and non-insurance cattle.

$$P = Pnp + Ppa + Pna$$

Information:
P = Total Revenue
Pnp = Non-Farm Income
Ppa= Sheep Farming Income with Integration of Livestock with Agricultural Crops
Pna= Sheep Farming Income with Non-integration of livestock with agricultural crops
Income contribution from sheep farming activities that implement livestock integration with agricultural crops:

$$Kpa = (Ppa/ P) \times 100\%$$

Kpa = Contribution of sheep farming that implements livestock integration for farmer/breeder income
Ppa = Farmer/breeder income from sheep farming activities that do not implement livestock integration
P = total income of the farmer's household

An explanation of the income and contribution of livestock that implements sheep integration can provide information on various problems faced by farmers/breeders. The results of the analysis can be used to analyze what needs to be done for the development of the concept of integration of sheep in Langkat Regency.

Results And Discussion:-
Characteristics of Farmers Applying Integration
Characteristics of breeders will describe the motivation, characteristics, self-concept, values, knowledge or expertise of farmers in conducting livestock business. The variables of age and formal education, length of business in raising livestock and the length of time applying the integration of crops and livestock are the socio-demographic characteristics of breeders. Variable area of land and land location is a characteristic of farming.

The first characteristic is the age of the breeder which is one of the indicators that influence the way of thinking and physical ability in running a livestock business. Farmers in Indonesia tend to be old and conservative in responding to changes in innovation and technology. Young farmers will tend to quickly adopt innovations even though they are still inexperienced (Ilhamet al., 2014)

Table 1:- Characteristics of Sheep Breeders who carry out integration.

	Description	farmers	percentage
1.	**Age (Year)**		
a.	26-35	22	37%
b.	36-45	10	17%
c.	46-55	15	25%
d.	>55	13	21%
2.	**Formal education**		
a.	Primari School	11	19%
b.	Junior High School	13	22%
c.	Senior High School	26	43%
d.	Bachelor	10	16%
3.	Large area(Ha)		
a.	0–0,9	36	50%
b.	1–1,9	14	30%
c.	≥2	10	20%
4.	**Farming experience (Year)**		
a.	1-10	22	37%
b.	11-20	28	47%
c.	21-30	7	12%
d.	31-40	2	3%
e.	>40	1	1%
5.	**Long-time applying the concept of integration (Year)**		
a.	1-5	15	25%
b.	6-10	24	40%
c.	11-15	17	28%
d.	16-20	3	5%
e.	>20	1	2%
6.	**Area Secanggang District**	**60**	**100**

Source: Processed primary data

The results showed that 37% of breeders were between 26-35 years old. Most of the breeders are second generation and continue their parents' farming business. This age is still classified as productive and has the potential to develop business integration of sheep and agricultural crops. Breeders who are still of productive age will enable them to more easily accept innovation and improve their livestock business.

Education is one of the factors that influence a person's way of thinking. A high level of education will help in receiving information, making decisions and adopting technology and innovations, especially those related to the

integrated development of sheep and other agricultural crops. Most of the education level of sheep breeders is high school, which is 43%. It can be said that farmers have a fairly good level of education. Breeders who have a higher level of education will be more rational in thinking than breeders with lower education. Soedjana, (2007) said that the lack of an educated workforce absorbed has an impact on the slow growth and economic development because education is very important and affects productivity. Education makes people faster and more ready to face change.

Land is one of the factors of production that is very influential on farming. The size of the farm production is influenced by the area of land used. The results of this study indicate that farmers who apply this concept have a medium land area. Sheep farmers who apply the concept of integration as much as 50% have a land area of 0-0.9 ha, while 1-1.9 ha is 30% and 2 ha is 20%. According to Schilling and Sullivan (2014), small-scale family farms are more likely to apply the concept of integration. Family farming is a small business managed by an individual whose main livelihood is as a farmer. This is because small-scale farming has limited access to markets, so this concept is actually very beneficial for small-scale livestock businesses.

Farmer's experience is a knowledge gained by the farmer through his livestock business activities and from the events he has experienced. Experience in doing farming will affect cultivation techniques and how to run their business because they already have knowledge and experience. Farmers who have longer farming experience will be able to plan better farming because they already understand all aspects of farming. From Table 1, it can be seen that 47% of farmers have started raising livestock for 11-20 years. Breeders start raising livestock when they are very young so they have quite a long practice.

The concept of integrating livestock with other crops is a concept that allows farmers to increase their farming results. The concept of integration is quite attractive to farmers who aim to increase their income. This breeder applies the concept of integration for 6-10 years as much as 40%. The time to apply this concept is certainly still shorter than the experience of raising sheep.

Based on the results of field observations, surveys and interviews, almost all of the sheep farmers who apply this integration concept have a location behind their residence.

If you look at the characteristics of farmers and farms that apply the concept of integration, the opportunity for developing this concept is quite large. The age of breeders who are still productive and have experience in raising livestock so that they have the ability to adopt and implement innovations in the development of livestock businesses that use the concept of integration.

Farmer's Income and Contribution to the Concept of Integration of Livestock with Plants

The income of sheep farming in this study is the income of sheep breeders who implement the integration of livestock with plants. This classification is carried out in order to determine the amount of income contribution through integration to the total income of sheep farmers. The results of the income analysis of sheep farmers in Secanggang District, Langkat Regency can be seen in table 2 below.

The table below shows revenues, expenses and revenues. The largest cost components are fertilizers, pesticides and drugs, amounting to 40.96% of the total cost, while the cost of seeds, feed and cages is 36.49%. Sheep farmers tend to be very often in taking feed by slashing.

The workforce consists of Domestic Workers (TKDK) and Outside Family Workers (TKLK). In the integration of sheep farming activities, it requires a lot of manpower to provide feed, fertilizing, thinning, spraying, and treating. Labor costs incurred by farmers amounted to 27.91% of the total cost. Other costs consist of water, electricity and land taxes paid by farmers per year.

Table 2:- Income Analysis of Sheep Breeders in Secanggang District, Kab.Langkat Year 2022.

No	Description	income	Percentage
	Integrated (Rp)	114.277.313	
(2)	NonIntegrated(Rp)	30.973.527	
	Cost Seeds, feed and cage(Rp)	24.800.500	36,49%
(2)	Fertilizers, pesticides and drugs(Rp)	18.110.400	40,96%

(3)	Labor(Rp)	18.970.000	27,91%
(4)	s h r i n k i n g (Rp)	2.889.250	4,25%
(5)	Other cost(Rp)	3.193.750	4,69%
	Totalcost (Rp)	67.963.900	
	Income(Rp)		
	Integrated(Rp)	46.313.413	
(2)	Non- integrated (Rp)	6.173.027	

Source:Processed primary data

The advantage of the integration concept is that farmers benefit if the price of livestock is lower because it is substituted or supported by the crops they cultivate

From the results of income analysis, farmers earn an income of Rp 46,313,413 through the concept of integration, while from non-integration they earn Rp 6,173,027. This shows that the contribution of sheep and crop integration to the total income of sheep farmers is 88.24%.

The results of this study indicate that the integration of sheep with crops has a positive impact on increasing the income of farmers. This is in accordance with the research of Schilling et al. (2014) which states that agrotourism has a positive and significant effect on farming profits. This impact is mainly for small-scale farmers who are run by individuals.

Conclusion:-
Based on the results of the study, it can be concluded that the characteristics of farmers who apply this integration are at a productive age, a fairly good level of education, family and small business scale, have been farming for a long time but are still relatively new in implementing the concept of integration. The concept of integration itself has a positive impact on increasing revenues and profits received by sheep farmers.

Recommendations:-
The concept of agro-tourism is quite promising and can increase the income of farmers, but in order for this integration business to be sustainable and develop it is necessary to innovate both in terms of farming and processed products.

Conflict of interest
The authors declare that they have no conflict of interest

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