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The analysis of seasonal crops integration of income-beef cattle live stock in Bone country Bolango Gorontalo Province, Indonesia

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A B S T R A C T

The analysis revenue the analysis on the integration of seasonal crops and beef cattle in the district Tilongkabila Bone Bolango Regency on the integration of seasonal crops and beef cattle in the district Tilongkabila Bone Bolango Regency. This study aims to know contribution to the integration of seasonal crops (rice plant, corn) and beef cattle on farming income. The research method used is a survey method by using List of Questions tools (questionnaires) and conducted interviews with a respondents. The data analysis method used is 1) descriptive the analysis to describe the state of the respondents which quantitative, 2) to know the contribution the integration revenue seasonal crops (rice plant, corn) and beef cattle then used the analysis of income. The results of this study indicate that the average livestock ownership of 6 tails contributes Rp. 16,485,607 (54%) with an area larger than the average tenure 0,> 1 Ha Rp. 14,090,691 (46%). Quantitative Analysis indicates that more and more cattle kepemiikan increasingly widely cultivated and yang diushakan land use will increase the contribution of return of farmers in Sub district Tilongabila Bone Bolango Provision

Introduction

Indonesia is known as an agricultural country meaning that agriculture played an important role of the national economy. This can be shown much population living and worked in the agricultural sector. The

agricultural sector as an integral part of national development systems is increasingly important and strategic in line with currents changes in the national and international scope of. The main objective

national development is to improve living standards, intelligence and welfare of all people. One indicator of the welfare of farmers is increases levels of income. Ikbal (2006) revealed that the increase in earnings can be obtained by diversification of farming well as the existence of income other than farming system.

According to the view structuralists (Bustanul Arifin, 2005) the agricultural sector able said to be alive if the income of farmers has increased and better the welfare of farmers. Therefore, all available energy needs to be directed to the welfare of farmers and the rural agricultural sector is generally. In view of the populist mashab agricultural revitalization can be said to be successful if agricultural development that has been carried out is able to help alleviate farmers and other rural citizens of of the shackles and poverty.

The keywords of view second school of thought the above is an increase in farmers' income, as well as the agricultural and rural development. Therefore the in accordance with the spirit of regional autonomy, in the Constitution - Act No. 32 of 2004 on Regional Government and Constitution - Law No. 33 of 2004 on Financial Balance Central and Regional Government was given wide authority to execute and manage the wheels of governance in terms of utilizing and explore the potential of available resources in the area of an effort to improve welfare of society.

In the welfare improvement of agricultural development is one of the is quite strategic sectors in the Indonesian economy, especially in food production, GDP growth, substitution of imports, provision of employment, and business opportunities. Development of the agricultural sector which includes plantations, farms, forestry

and others conducted through the a system approach and competitiveness of agribusiness activities, berkerakyatan, sustainable, decentralized, well as covers the upstream aspects, cultivating, downstream aspects, nor supporting components.

Farms development is a part of the development of agriculture in the broad sense. With the development policy as stated in the mandate of the Agriculture, Fisheries and Forestry (RPPK) which has been proclaimed by the President dated June 11, 2005, the agricultural development needs to take a holistic approach and integrative with others sub-sectors under the auspices of the agricultural sector and to build endurance steady food. According to Ali et al. (2011) The program supposed be run in an integrated and unified.

One of the business integrated farming system namely the system integration of crop - livestock. For example, system integration rice crops, corn-beef cattle livestock which is the intensification farming systems through the management of natural resources and the environment in an integrated with the components of beef cattle as part of business activities. System integration of rice plants, corn-beef cattle is one of the upayah to increase the production of beef cattle as flesh the largest contributor against national meat production so that cattle business potentially to be developed to increase the income of farmers.

The integration of rice plants, corn with of livestock in Gorontalo Province, especially in Bone Bolango Regency already become a farming activities which increase the income of farmers. This Farming System is supported by the production of food crops and beef cattle livestock farming system population at Regency Bone Bolango potential. Agricultural lands, especially rice

field area in Bone Bolango in 2012 covering an area of 2046.93 acres that consist of semi-technical irrigation County (1897.28 ha), land Tada Rain (38.50 hectares) and others (111.15 ha) or largely rice crop using technical irrigation systems which reached 92.69 percent (Data from Central Bureau of Statistics, 2012). As for the production of rice crop, of corn annually increased every year as shown in Table 1.

While the beef cattle population Bone Bolango Regency in 2012 as much as 2,442,152 tails and the most cattle population in District 5376 Tilongkabila as much as tails as shown in Table 2 below.

Based on the table above signifies that the integrated of beef cattle farm business with crops plant, corn potential to been developed in support of the sustainable farms of business activities by optimizing the utilization of local resources available for acquire profits for farmers, ranchers in Bone Bolango regency.

Suharto (2000) in reference Priyanti (2007) stated that the integration system is the an integrated effort the application of through the the Low of External Input approach between rice commodity and cattle, where the rice straw is used as cattle feed producer of cattle and livestock manure as the main ingredient of compost as organic fertilizer can improve soil fertility.

Low External Input approach is a way in the applying concept of integrated farming by striving the use of inputs from its own agricultural system, and minimizes the use of production inputs from outside the agricultural system.

Communities in the Bone Bolango Regency have long been do system integration between the rice plants, corn beef cattle livestock (Integrated Farming System)

which is in addition to rice plant, corn also maintain beef cattle livestock. But in the people do not pay attention to the factors which affect the production of farming so that does not affect the maximum expected revenue.

Based on the above, and look the potential for the production of rice plants, corn and livestock population at Regency Subdistrict Tilongkabila Bone Bolangoparticulathe authors interested conducting research with the title "Income Analysis on System The integration of (Integrated Farming System) Rice Plants, Corn - Beef Cattle in that area.

Materials and Methods

Location and description of study area

This study was conducted in the district Tilongkabila Bone Bolango regency, Gorontalo province. The research was conducted from 12th May to 14th July 2014. Location determination is based on the consideration for the location of the base of the development of beef cattle and crops of rice, maize by local government (Department of Agriculture and Animal Husbandry) Bone Bolango Regency Gorontalo Province.

The instrument and information study

The research instrument is a tool in collecting a data. This study requires the data to test the hypothesis. The data is that is collected facts. Collecting facts is of procurement process the data through standard procedures that and the systematic. The data that are used as ingredient in this study was included primary data and secondary data. Primary data was obtained from the farmers selected respondents in the sample by using a list of questions (questionnaires) which has been prepared in advance. Secondary data is data that taken of

agencies related to the topic of this research. The questionnaire used in this study more can see in the attachment.

In the preparation of the questionnaire necessary played targets (direct or indirect) and the shape of the questionnaires (stuffing, stuffing option or combination of options). In this study respondent target is directly with the questionnaire form a combination of fields and options. For secondary data obtained from relevant institutions as well as related literature. The materials prepared on questions of structured questionnaire, which the question created such a way that respondent be limited in answering the questions on some alternative any with a language that is easily understood.

Primary data include characteristics of farmers, mastery agricultural resources, farming activities, economy activity outside farming. Farm production, farming income, application of agricultural technology and so forth, the data obtained through interviews respondent based on a list of questions that have been be prepared and direct observations on some farmland.

Secondary data such as the amount and average area of land farmers, the average harvest area, production of rice, corn, livestock population, population, climate, administrative area and etc., is obtained from the Village Office, District, Office of the Department of Food Crops and horticulture, Animal Husbandry Department at Regency Office Bone Bolango Gorontalo

Methods of sampling

The first stage, were purposively selected in the subdistrict Tilongkabila Bone Bolango Regency of Gorontalo province, with the consideration that location is one of the base region of the development of beef cattle and has a sizeable total population of as many as

1552 farmer-breeders compared to other sub districts in the Regency Bone Bolango.

The second stage, from total population of proficiency level conducted by determination the magnitude of sample that can be representative of the population. The determination of the amount of the magnitude of the sample is done with the formula of Slovin in Umar (2001) as the following.

$$n = \frac{N}{1 + N (e)^2}$$

wherein : n = number of samples
N = the amount population
e = the level of leniency (15%)

thus obtained the following results:

$$\begin{aligned} n &= \frac{N}{1 + N (e)^2} \\ &= 1552 / (1 + 1552(0,15)^2) \\ &= 43,2071 \\ &= 43 \end{aligned}$$

The third phase, the study sample was obtained by 43 farmers in Kecamatan Tilongkabila, Bone Bolango Regency. Because the population is heterogeneous, namely the amount of livestock and land ownership are different so as to obtain a homogeneous a data then carried out by Stratified sample withdrawal is random sampling population is classified into strata based on the scale of land are as following:

The fourth stage, at the sub-district in the village was randomly select six simple: Bongoime Village, Village Tamboo, Mootilango Village, Village Butu, Tunggulo village, and the village of Moutong as a sampling study.

The fifth stage, in every selected villages farmers election respondent as the unit of analysis the farm level. Sampling conducted

using stratified random (stratified random sampling) stratified based on farmers cultivated land area and are grouped into three business scale. Namely: 1) Peatni who seek 0.5 hectares farming land. 2) Farmers who cultivate land from 0.5 to 1.0 ha and 3) Farmers who cultivate land over 1.0 hectares.

The sixth stage, selected farmers in every village is also divided into two groups according to which branch branches farming rice crops, particularly corn rice, corn and beef cattle business branch or in this study is called system integration paddy, maize and cattle.

Method of Analyst

In accordance with the objectives to be achieved in this study, the models and analysis techniques used in this research is conducted are:

Descriptive analysis

This method is used to describe the state of respondent were quantitative. The picture is in the form of the development of crop farming rice, corn, cattle, and also illustrates the characteristics of respondent, which consists of resident identity, education, business experience, extensive land use, the number of animals grown, the number of workers that are used and description of the variables study.

Analysis of income

Analysis of the data used is descriptive statistical analysis is to calculate the average income, and tabulating a data. Analysis of a data to determine farm income in the system integration of rice plants, corn-beef cattle in Kecamatan Bolango Bone Bolango Regency as the following:

1. To determine the acceptance of beef cattle breeding business with system integration rice plants, corn-beef cattle livestock used the formula

$$\text{Total Revenue (TR)} = Q \times P$$

(Soekartawi, 2003, 57-58)

Where:

TR=Total Revenue/revenues (Rp/Year)

Q=Total production/ year

P=price (Rp)

2. To determine the income or profits of beef cattle breeding business with system integration of rice plants, maize-beef cattle livestock used the formula

$$\pi = \text{TR} - \text{TC} \text{ (Soekartawi, 2003, 57-58)}$$

Where:

π =Total income generated by farmers(of Rp/Year)

TR=Total Revenue / Revenue obtained breeder (of Rp/Year)

TC=Total Cost/Cost incurred breeder (of Rp/Year)

Total Revenue (TR) =QxP (Soekartawi, 2003, 57-58)

Results and Discussion

Analysis of production and revenues integration of plant beef cattle

Acceptance of enterprises integration system rice plants, corn-beef cattle

Acceptance of in effort integration system of rice plants, corn - beef cattle is all revenues the resulting during the the year or during a period in namely the research of the amount of production that are sold in multiply it the selling price. Soekartawi, et al (1986) in (Siregar, 2009: 34) states that acceptance is the total value of farm products in a given period of time, whether for sale or not on salewhereas according to Soeharjo and Patong (1973) in (Siregar, 2009: 34) states

that acceptance is the product of the total production by the price per unit. The total production is the main results and byproduct, while the price is the price at the farming level or farmers selling price.

Acceptance of beef cattle is enterprises

Acceptance of beef cattle farmers in the district Tilonkabila Bone Bolango Regency, can be seen the table below

Acceptance of for Rice, Corn

Acceptance of system integration corn plant in District Tilonkabila, Bone Bolango Regency, receipt of can be obtained from farming in rice, corn 1 (rice), receipt of tanamn season 2 (rice, corn), and the extra revenue from crop waste rice, maize during the one year. The receipt of system integration can plant dilihan in table 5.

Total Acceptance of In the Integration of Rice, Corn and Beef Cattle

Total revenue is the result of revenues generated from the beef cattle business effort rice crop, corn. Total revenues in effort integration system of rice plants, corn-largest beef cattle are on a scale of land area > 1 ha of Rp. 90,258,571 / yr and smallest in scale land area <0.5 Ha of Rp. 48,635,324 / yr in which the size of the receipt of is affected by the level of scale-owned businesses.

In the total effort receipt of integration system of rice plants, corn-biggest beef is the beef cattle business in effort compare paddy, corn this is due to the size of population and cattle which sold where cattle have value selling price and the value end of the year high compared with the

receipt of paddy, corn derived from rice, rice, corn.

Harnanto (1992), argued that receipt of each respondent varies depending on the number of cattle population owned by each farmer to use the relationship between revenues and expenses it is known branches of farming profitable for at try. For more details, the total income of the integration of paddy, corn and cattle can be seen in table 6.

Cost of Seasonal Plants Production Systems Integration-Beef Cattle

Production Cost of on effort integration system of rice plants, corn-beef represent costs incurred in the farmer-breeders business activities for one year. Cost of production is crucial from petanipeternak business activities undertaken because it can affect revenues.

Production Cost of incurred by the farmer-breeders in the district Tilonkabila Bone Bolango Regency in farming activities are divided into two kinds of costs are fixed costs and variable costs. The costs of production that exist in effort integration system of rice plants, corn-beef cattle in the district Tilonkabila Bone Bolango Regency among others

Fixed Costs

Soekartawi (1995): fixed costs are costs incurred by the farmer-breeders that are still not depend on the size of the production. Fixed costs incurred on systems integration of rice plants, corn cattle in District Tilonkabila, Bone Bolango Regency consists of depreciation of equipment, depreciation cage, and taxes. Each large fixed cost component can be seen in the table 7.

Table.1 Harvested area and total production of rice crop, of corn in Bone Bolango Regency 2013

No	Commentary	2010	2011	2012
1	Rice of corn			
	Harvested Area (Ha)	2044	2078	2086
	Production (Ton)	8.375	8.599	8 609,8
2	Rice of corn			
	Harvested Area (Ha)	3054	3.132	3 145
	Production (Ton)	14.352	14.475	14 598

Table.2 Population of beef cattle each district in Bone Bolango Circumstances in 2013

No	Districts	beef cattle		Totality
		Manly	females	
1	Tapa	405	493	898
2	Bulango Utara	793	893	1686
3	Bulango Selatan	413	517	930
4	Bulango Timur	391	448	839
5	Bulango Ulu	384	701	1.085
6	Kabila	798	926	1724
7	Botupingge	365	446	811
8	Tilongkabila	2388	2988	5376
9	Suwawa	616	706	1322
10	Suwawa Selatan	126	246	372
11	Suwawa Timur	746	983	1729
12	Suwawa Tengah	275	380	655
13	Bone Pantai	1750	2031	3 781
14	Kabila Bone	798	978	1 776
15	Bone raya	651	853	1 504
16	Bone	2097	2261	4 358
17	Bulawa	1132	1332	2 464
Total Population				2442152

Data sources: BPS Bone Bolango Regency 2012.

Table.3 The results calculation of taking samples

No	scale land area	Population	Calcultions	Samples
1	< 0,5 Ha	823	$823/1552 \times 43$	23
2	0,5 – 1 Ha	475	$475/1552 \times 43$	13
3	> 1 Ha	254	$254/1552 \times 43$	7
Amount of		1552		43

Source: Primary Data Processed in Kecamatan Tilongkabila, Bone Bolango Regency

Table.4 Acceptance average score beef cattle breeders in District Tilongkabila Bone Bolango Regency, 2013

Scale of Effort (Ha)	Occupancy Cattle (tails)	Cattle End of Value (Rp)	Sold Cattle Value (Rp)	Acceptance of Feces (Rp)	The total Receipts (Rp)
< 0,5	4	620,500,000	181,500,000	21,392,000	823,392,000
		26,978,261	7,891,304	944,370	35,799,652
0,5 -1,00	5	401,300,000	182,000,000	16,687,000	599,987,000
		30,869,230	14,000,000	1,283,615	46,152,486
> 1,00	6	251,500,000	120,250,000	8,649,000	380,399,000
		35,928,571	17,178,571	1,235,571	54,342,714

Primary Data Sources After the in Olah 2014.

Table.5 Acceptance of score for Rice, Corn 1 and 2 in the District Tilongkabila Bone Bolango Regency

Scale of Land (Ha)	Cattle End of Value (Rp)	Sold Cattle Value (Rp)	Acceptance of Feces (Rp)	The total Receipts (Rp)
< 0,5	225,225,000	145,081,000	45,199,460	415,505,460
	9,792,391	6,307,870	1,965,194	18,065,455
0,5- 1,00	236,100,000	152,748,000	21,625,450	410,473,450
	18,161,539	11,749,846	1,663,496	31,574,880
>1,00	128,500,000	149,860,000	22,049,495	300,409,495
	18,357,143	21,383,714	3,149,928	42,915,642

Source: Data primer After Processed in 2014

Table.6 Acceptance of stocking Avg rice farming, corn and beef cattle in District Tilongkabila Bone Bolango Regency, 2013

Scale Area of land (Ha)	Acceptance of Integration Plant and Beef Cattle		The total Receipts (Rp)
	Beef Cattle	Plants 1 and 2	
	< 0,50	35,799,652	
0,50 -1	46,152,846	31,574,880	77,727,726
>1	54,342,714	42,915,642	97,258,356

Table.7 Average fixed cost of integration plants - livestock husbandry in district Tilongkabila Bone Bolango Regency, 2013

Ascale Land Area (Ha)	Ownershpa scale(Tail)	Fixed Components of cost (Rp / Year)							Total Fixed Costs
		The cattle business				Crop Farming System of ric, the corn			
		Cost of Cage	Cost of Equipment	Tax Cost	Total of Cost	Cost of cage	Tax Cost	Total of Cost	
0,50	4	140,00	73,91	40,44	256,96	92,83	7,39	100,22	357,17
0,50-1Ha	5	144,62	77,50	57,69	272,12	159,36	13,23	172,36	444,48
1 Ha	6	168,57	78,57	64,29	311,429	126,920	16,92	143,84	455,269

Source: Data primary After Processed in 2014.

Table.8 Average variable costs in integration system for rice, corn - beef cattle in district Tilonkabila Blango Bone district, 2014

Ownership ascale (Tail)	Component cost (Rp)									Total variable cost
	The cattle business				Farming System of ric plant, the corn					
1	17.456.51	770.51	315.44	4.222.83	22.765.30	1.063.11	1.941.41	7.206.52	10.211.05	32.976.34
2	26.057.69	915.23	442.31	4.442.31	31.857.53	2.652.51	3.621.26	9.548.08	15.821.84	47.679.38
3	27.857.14	925.11	441.43	7.039.29	36.262.97	6.674.24	7.772.14	14.785.71	29.232.09	65.495.06

Source: Data primary After Processed in 2013

Table.9 The average the total cost of the enterprises systems integration rice plant, corn-cattle in district Tilonkabila, Regency Bone Bolango

Land Area (Ha)	Scale of ownership	Revenues (Rp/ Year)						total cost of production
		The cattle business Cut		Farming System Rice Plants, Corn				
-	-	fixed costs, (Rp)	variable costs (Rp)	The amount of costs (Rp)	fixed costs, (Rp)	variable costs (Rp)	The amount of costs (Rp)	-
□ 0,50	4	256,96	22,765,30	23,022,25	92,83	8,421,37	8,514,20	37,185,33
0,50 -1,00	5	272,12	31,857,53	32,129,65	159,37	12,932,51	13,089,20	50,565,01
□ 1,00	6	311,43	36,262,97	36,574,35	143,85	28,557,81	28,824,95	65,339,30

Source: Primary Data After in Processed 2014

Table.10 The average revenues integration rice plants, corn and beef cattle in District Tilonkabila Bone Bolango Regency

Land Area	Scale of ownership	Revenues (Rp/ Year)						Total Revenue farming system crop livestck
		The cattle business		Farming System Rice Plants, of Corn				
-	-	Acceptance Of	Production of Cost	the amount of revenue	Acceptance Of	Production of Cost	the amount of revenue	-
□ 0,50	4	35,799,65	23,022,25	12,777,40	18,065,46	8,514,20	9,551,25	22,328,65
0,50-1,00	5	46,152,49	32,129,65	14,022,88	31,574,88	13,089,2	18,485,68	27,112,20
□ 1,00	6	54,342,71	36,574,39	17,768,32	42,915,64	28,557,9	14,357,83	46,148,99

Source: Data primary After Processed in 2014

Table.11 Contributions revenues in systems integration rice, corn beef cattle in District of Tlongkabila, Regency Bone Bolango

Scale Land Area (Ha)	scale ownership	Revenue beef cattle (Rp/Thn)	Incamof crops (Rp/Thn)	total farm revenue *Rp)	Beet of cattle (%)	Crop s (%)
< 0,50	4	12,777,40	8,514,203	21,291,60	60%	40%
0,50 – 1,00	5	14,022,84	13,089,200	27,112,04	52%	48%
>1,00	6	17,768,32	28,557,90	46,326,13	38%	62%

Source: Data primary After Processed in 2014

Variable costs

Rasyaf (1995), Variable costs represent costs that are change according the amount of production so that the size of the variable costs will be determined by the size scale and the resulting production. Variable costs incurred by respondents in venture integration system of rice plants, corn-sapipotong in District Tlongkabila, Kabupan Bone Bolango Regency can be seen in the following Table.8.

The total cost of enterprises systems integration rice plant, corn-beef cattle

The total cost represents the number of fixed costs and variable costs are issued by the farmer-breeders in their business processes. The total cost of the dikeluarkan on business integration system of rice plants, corn-beef cattle in District Tlongkabila, Bone Bolango District can be seen in the Table 9.

Revenue in integration system rice plants, corn- of beef cattle

Incomes is the amount of money earned once all expenses are covered if a positive result means the reduction of profit, otherwise apabila negative result means the loss reduction, Rasyaf 1999 in Asna (2009). The amount of income of livestock farmers in the business integration system of rice plants, corn-beef cattle in District

Tlongkabila, District Bolngo Bone can be seen in the Table 10.

Contributions revenue to the integrated system rice plant, corn-beef cattle

Contributions effort integration system rice plants, corn - of beef cattle can be obtained published as getting the magnitude of each total of income both from of income and of income of beef cattle rice plants, namely corn planting season 1 and season 2 in District of Tlongkabila Bone Bolango Regency.

As for the contribution of the effort integration system rice plants, corn - of beef cattle can be seen in Table 11.

Conclusion

Based on the description of the results of this scientific work, it can be concluded that: System integration of rice plants, corn - of beef cattle at the level effort scale <0.50 ha, and scale ownership of beef cattle earn Rp. 11,826,026, giving an average income of farmers amounted Rp.21,003,173 for large scale> 1 ha, and Rp. 23,197,101 on a scale of 0.50 to 1 ha, and Rp. 11,826,026 on a broad scale land <0.5 ha. System integration of rice plants, corn -sapi cut a major contribution to the revenue-livestock farming system is the contribution of corn on a scale rice farming land area <0.5 ha

66.40%, 74.04 ha and 0.50 to 1 scale and scale > 1 ha of 78.00% and for of beef cattle on a broad scale land <0.5 ha 33, 60%, scale 1 ha land area 0,5- 25.96%, and the scale of land area > 1 ha 22%.

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