

Analysis of Diversification Pattern and Income of Integrated Farming That Developed Cashew Farmers in the Muna Regency

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Abstract- This research aims to: (1) identify the pattern of diversification of farming farmers developed integrated cashew nuts on Muna Regency, (2) know the integrated farming income based on patterns of diversification developed cashew nuts farmers. The research was carried out on the territory of the Center for the development of the mainland people's cashew plantation Island Muna Regency Muna concentrated. The study lasted for five months that the focus on the period of the flowering period to post harvest cashew nuts starting from April to August 2016. The data type of this research is quantitative data and qualitative data, and data sources include primary data and secondary data. The analysis of Data used to identify patterns of diversification farmer farmer developed integrated cashew nuts on Muna Regency is a qualitative descriptive method and integrated farming income based on the pattern of diversification of smallholder cashew nuts that are developed using the formula: = NP-BT-BD, which, Integrated farming income = (IDR), NP = the value of the production (product products with unit price), BT = cash cost of farming (IDR), BD = the imputed Cost (IDR). The research found two prototypes and five integrated farming diversification patterns which have developed in cashew nut farmers Muna namely (1) the prototype Integrated farming various plants (Multiple Cropping) and horizontal diversification method that is adaptive – autotrophics production and (2) the prototype Integrated farming crop-livestock Integration (Multiple integration) and Vertical Diversification coordinative method which is mutual-herbiforics productions. The diversity of patterns of diversification of farming farmers developed integrated cashew nuts on Muna Regency is the Subsistence level of farming integrated Facultative i.e. (a) integrated farming patterns of cashew nuts//food crops and (b) the pattern of farming integrated cashew/HMT + horses. Integrated farming Commercial level i.e. (c) the pattern of farming integrated cashew/HMT + cows, (d) cashew nuts/HMT + Goat (e) cashew nuts/corn + poultry. Integrated farming of commercial significance in different level than the subsistence level in Facultative. The highest income occurred in integrated farming patterns of integration of cashew nuts – cows with average gains of IDR. 38,313,000 and cost benefit-ratio (B/C) = 8.07 and lowest on integrated farming pattern patterns E integration of cashew nuts-poultry with the average income of IDR. 10,974,000 and the benefit-cost ratio B/C is 4.18.

Index Terms- pattern diversification, income, integrated Farming

I. INTRODUCTION

Cashew nut (*Anacardium occidentale*, L) is one of the commodities of plantations which have significance for the economy of Indonesia. In addition to foreign exchange earner as the country and the source of income of farmers, also serve for land conservation efforts. Cashew nuts come from South America and Brazil, known as the plant grows well on greening, tropical climate, and spread to Indonesia in the 1960s. After the economic value then developed the cultivation of cashew nuts in the form of business people's estates. Cashew nuts plantations business people in addition to functioning as a plant conservation, as well as a producer of foodstuffs and industrial raw materials (Cahyoo, 2001).

Development of cashews as cash crops and industrial crops receive priority in the development of agribusiness plantations, especially the East region of Indonesia. Cashew is the main producing areas to contribute to a national cashew agribusiness is Southeast Sulawesi (47.5%), South Sulawesi (20.4%), East Nusa Tenggara (5.0%) and Bali (3.5%), (Daton and Tinaprilla, 2008). Raw cashew nut production data Southeast Sulawesi 2014 around 37 981 tonnes, and productivity is around 417.16 kg / ha with an area of about 120 871 ha farm. and the number of farmers 100 633 households. Muna is one of the growth areas of cashew plantations in Southeast Sulawesi with a total area of planting 33 986 hectares or 28.12%, the production of 6602 tons or 17.38%, the productivity of 328.8 tons / ha / year or 78.82% and the number of 28 562 farmer households, or 28.38%. (Updating BPS data Southeast Sulawesi Crops and Horticulture, 2014).

Demand export raw cashew production nationwide increased from year to year until the year 2014 mainly to India and Vietnam which is a major producer of cashew world. Export of cashew dominant form of logs approximately 49.0% (36% and 13% logs cashews) has hurt farmers, the processing industry and the government. The losses in the form of a potential loss of entrepreneurial opportunities in cashew processing to obtain economic value added, which has up IDR.1,8 - 2.9 trillion per year. These conditions indicate that the importance of the cashew industry Indonesia for the international market (Listyati and Sudjamoko, 2011).

Efforts to diversify farming of cashew in the form of intercropping with crops interrupted (corn, cassava and peanuts) and integration with cattle on dry land, can increase income, food production, farmer motivation, and opportunity management

efforts compost as organic fertilizer available 2, 1 ton per week, (Witjaksono, et al., 2004). Farm diversification is an attempt expansion and diversification of the type of farming through technological innovation. Because the application of technology in diversifying the number of farms would lead to integrated farming system performance varied. By Drucker (1986) in Alifuddin and Rasak, (2015) confirms that innovation is the special function of entrepreneurship, both existing business, public service institutions, as well as start-up individuals. Technological innovation can open up opportunities in the mix of farm land cashew crop monocultures. If the utilization of land resources, labor and capital optimally through technological innovation will increase farm productivity integrated sustainable manner. Integrated farming system is a system of integrated agricultural development with technological innovation, social engineering and financial engineering as well as institutional engineering. The technological innovations include entrepreneurial environment seeks to find, create, and develop new products, methods and equipment that can be utilized for increasing the productivity of agribusiness. Agricultural technology innovation entrepreneurial environment by optimizing the utilization of resources (land, labor, and capital) will drive increased productivity and sustainable farming income (Ashari, 2006, Mardikanto, 2009).

Farmers on the island of Muna has long been seeking Cashew and empower wastelands between cashew crop monoculture, family labor and capital, but not optimal. This allows for the implementation of integrated farming systems with farm diversification patterns and application of entrepreneurship can increase the added value and the food security of farmers (Said, 2004). Efforts in increasing production and income farmer cashew in districts Muna required cashew farming systems diversification. This study aims to: (1). identify patterns diversified integrated farming developed cashew farmers in Muna, (2) determine the integrated farm income diversification patterns developed by farmers of cashew farmers in Muna.

In this study suggests some important information and technology and renewable: First, it is important Issue cashew plantation farming is farming awakened the performance of the pattern of subsistence farming, monoculture, aimed at reforestation. Land between nut crops is still potential for the development of other crops or livestock enteidrrises. Supriatna Research, (2005), about the performance Cashew plantation farming folk conclusion that farming of cashew originally planted as reforestation land rehabilitation. Recommendation technology, Muna local seed varieties, productivity of 285 kg / ha / yr. Cost of family capital and family labor and the results are marketed as green. Mahajan and Parashram (2012) in a study of White Gold : An Experience of Cashew, concluded the potential for increased production of cashew appropriate environmental conditions can increase business opportunities for the poor in India (Kasuga, 2013). Performance cultivation genotype polyclonal seed varieties and local varieties of cashew orchards Southeast Tnzania. The study concluded that there was no significant difference between polyclonal varieties of seed orchards with local varieties in growth, plant height, diameter canopi, production, seed weight spindles. This study wants to analyze the performance of integrated farming of cashew entrepreneurship to increase

incomes and food security of farmers. Second, integrated farming and subsistence patterns, an attempt to diversify the technology applied to increase productivity. Empirical facts subsistence model of integrated farming of cashew people approaching Theory Dangerous Spiral Circle (Haidrer, et. Al, 1986).

Efforts to break the cycle of harmful spiral through a system of intensive polyculture farm diversification. The decision of farmers for farm diversification is a farmer courage to accept risks in entrepreneurship cashew. Wongnaa Research, (2013) Factors that affect productivity in the town WENCHI cashiew Ghana, show that (1). the average size farm on a subsistence level of about 3.33 acres, (2) extensive farming, farming technology (fertilizers, pesticides, pruning, education, extension contact) positively correlated to the increase in production cashiew. (3) labor and farming experience were not significant. Yuhono and Suhirman, (2006), analyzing the socio-economic aspects of conservation farming on sloping land with Agroforestry patterns. that (1). There are still many untapped sloping land with a plantation and forestry planting pattern, (2). Pattern still subsistence farming, conservation farming knowledge and technology is still low, but the response is quite high. (3). Integrated farming income is higher than monoculture farming. This study analyzed the factors farm diversification patterns and needs of integrated farming technology in increasing productivity and food security cashew farmers. Third, Concession cashew plantations for farmers means of investing and cost benefits to the needs of long-term survival. Integrated farming options, opportunities subsistence farming into commercial transformation through innovation entrepreneurship. Prajitno Research, (2009), integrated farming system as a model of sustainable agriculture diversification at farm level measured by the criteria; (1). The increase in total farm production due to the efficient use of available resources, (2) increase the income of farmers as a result of farm diversification. (3). Increased social and cultural values experienced by farmers as a result of the practice of integrated farming. (4). Improving the condition of the environment and conservation of land resources, water and other inputs. Analysis of the economic feasibility of an integrated farming system that (1) the integration of farmers apply food crops, plantations and cattle can create jobs for the community, increase production and farmers' income, (2) farmers are not prepared to maintain the cattle developed off the cage. (3) improving the welfare of farmers (Siswati and Aryanto, 2011). The same study Witjaksono, 2008. Assessing the economic added value of agricultural systems integration goats and Cashew concluded that (1). The added value of the increase in body weight of goats per head / day. (2) the added value of manure per day, (3) the value-added sales of organic fertilizer. In this study, to evaluate the difference in value-added benefits and costs of integrated farming developed cashew nut farmers in order to increase farmers' incomes and food security in the island of Muna among subsistence farmers to commercial farmers.

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II. RESEARCH METHODS

The research was conducted on the territory of cashew plantation development centers in mainland people are concentrated on the island of Muna. The study lasted five months and focus on the flowering period until the post-production from April to August 2016. The type of data in this study is qualitative data and quantitative data and data sources include primary data and secondary data. Data Analysis Method which is used to identify the pattern of diversified integrated farming developed cashew farmers in Muna using qualitative descriptive and determine the integrated farm income and a draw ratio of benefits to costs is based on the pattern of diversification developed cashew farmers farmer in Muna use = NP BT-BD, Where, = farm income Integrated (RM), NP = the value of production (the product of the products at a unit price), BT = Cash cost farming (IDR), BD = cost taken into account (USD) and the ratio of draw benefits at a cost integrated farming (ratio B / C) where, B = benefits of integrated farming of cashew and C = total cost incurred during the period of production.

III. RESULTS AND DISCUSSION

a. Characteristics Cashew Nut Farming

Table 1. Total TBM stands, TM, TTR, Production, Productivity and lost production Cashew every year in Muna.

No	Size and characteristics of stands Cashew	YEARS			
		2012	2013	2014	2015
1	TBM (Ha)	1.074	1.724	1.734	2.734
2	TM (Ha)	18.025	19.531	20.081	21.081
3	TTR (Ha)	12.668	12.181	12.171	12.171
4	Large (Ha)	31.767	33.454	33.986	35.986
5	actual production (ton)	2.565	6.373	6.602	7.902
6	Productivity (kg/ha)	142,3	326,3	328,8	374,84
7	TBM + TTR (Ha)	13.742	13.905	13.905	14.905
8	TM + TTR (Ha)	30.693	32.730	32.252	33.252
9	production Potential (ton)	4.361.6	10.679.8	10.604.46	12.464.18
10	production Lossed (%)	14,21	32,63	32,88	37,48

Source: Muna processed from BPS data in Figures, 2015

Information

TBM = Immature Produce

TM = Plants produce

TTR = old and damaged plants

TBM + TTR = area farm development potential of various plants

TM + TTR = area of potential development of livestock farming production integration potential is the result of cashew nuts are harvested from TM + TTR

Production loss = Loss (yield gap) is obtained from the difference between the production of potential production with actual production.

Based on the data in the table above shows that the 5:11 cashew stand condition can be described in broad development indicators immature plants (TBM) or young plants, plant area produces (the productive / TM), and a plant area of old / broken (TTR). Overall vast stands of cashew has increased every year for the last four years since 2012 to 2015. The increase in broad stands of plants Cashew 2015 respectively is 57.67% immature (TBM), 4.98% area plants produce (TM), the total area being old

crop / broken no increase / remain the same as in 2014 and the overall broad cashew crop has increased by 5.88% from 2014.

Increased extensive stands of cashew crop is directly proportional to the increase in production potential on a scale of farming both monoculture and polyculture farming / integrated. Muna in the last four years have shown a significant increase, but the results have not enjoyed by most people Muna. This is as shown in the table above. there are differences in the amount of actual production and potential production of cashew farming. This shows the productivity gap (yied yield gap gap I and II).

The difference in results yield gap I caused because the technology can not be moved and the environment. Yield gap II occurs due to differences in the productivity of a farm with the resulting potential farmers. There are two main factors that cause the yield gap II; constraints biological and socio-economic constraints (Cramer and Jensen, 1988, Sukartawi, 1989).

b. Patterns Diversified Farming Systems Integrated Cashew

Patterns diversified integrated farming and adoption of the technology applied in Entrepreneurship Development of Integrated Farming Cashew in Muna and sustainable food security can be described as follows :

The mindset of farmers (Mindset) has undergone a social transformation by changing the pattern of cashew farming through integrated farming approach of diversification of methods according to the needs of food and trade. Experience farmers in developing integrated farming, 2 (two) prototype developed integrated farming of cashew farmers in Muna namely: (1) Prototype farming Various plants and (2) that is a mixture of farming Prototype Various crop farming with livestock (integrated farming). Prototype integrated farming form the type of farming Multiple cropping (various plant) can be realized in this type of crop farming stream (intercropping) and the type of crop farming hallway / fence (Alleycropping). While farming prototype integrative (Multiple Integration) can be realized in the integration patterns Cashew Plants with different types of livestock both ruminant and non-ruminant. The farm Prototype is the appearance or performance integrated farming system developed cashew farmers. in Muna can be described as follows: (1). Prototype farming Various plants that intercropping crops (corn Cashew / Peanut Cassava) in the form of integrated farming that combines cashew crop to crop often called Multicropping or intercropping. This farming land use patterns nut together with the mutualistic nutrient competition. Farm diversification intercropping method as above to follow the adaptive function - autotrofics where a plot of land to grow and develop competition known as the method of horizontal diversification. It said horizontal diversification as jointly compete in absorbing nutrients on a plot of land and agro-climatic space above it. (2). Prototype farming miscellaneous farming (Multiple integration) can be cultivated commodity mix of crops - livestock such as: (a). integrated farming pattern (Cashew // Corn / HMT + Livestock Horse). Integrated farming patterns like this shows where the models agropasture cashew crop serves as shade and hedgerows along fodder and forage crops or cattle berth as a freelance cage.

While corn and banana plants that are food crops that farmers keep food availability. (B) miscellaneous Farming

(Cashew /corn / HMT + Cattle). Integrated farming is also a model of cashew plants agro pasture which serves as a shade plant and moorings livestock and serves as a cage or off. Cashew with cows mutually beneficial for the harvesting process to serve as a sorting seeds and artificial fruit, while the cashew plant expects that cow manure, can improve soil fertility. (C). Farming various patterns (Cashew // corn / HMT + Goat). Goats still relatively small ruminants and ruminant. Livestock is expecting feed of fodder and forage crops or older. Because of the combination of food livestock forage on land Cashew include hedgerows like Lamtorogung, Gamal, shrubs. Besides as a source of food goat can also produce byproducts that dirt as well as a manure for the main crop. (D). Pattern various farming (Cashew // maize + Poultry). The pattern of the last farm diversification is still a developing agroforestry systems commodity or free-range chicken cashew crop canopy taken. Hope farmers here are in addition to expecting revenue can also improve soil fertility of goat manure.

Integrated farming pattern patterns (b, c, d, e) is the prototype integrated farming methods Multiple integration with vertical diversification coordinative. This is possible because the integration Farming is a combination of farming that utilizes a piece of land with the integration of crop and livestock commodities that are mutualistic in a chain mechanism eat / feed chain (mutual herbiforics). In this context cashew expect livestock manure to enrich the nutrients and the humidity, while the feed of cattle expect cashew young leaves, or grass under the canopy of cashew and also can make the fruit of all the byproducts of cashew as feed. If the pattern of integrated farming want to increase scale commercial farming it must take measures (1). vertical integration, where the stages of production and or marketing of farming can be coordinated with the company as a partner, and or conduct (2). contract production of cashew farming where farmers are integrated making production agreements with processors, intermediaries, dealers as a first partner before or after the coming of the company. These results indicate that there are five patterns farm diversification cashew farmers in the district have been developed Muna. Cashew farm diversification in an integrated manner based on the widely spaced crops, forage grasses and vegetation microclimate that allows food commodities can grow and develop under the canopy of cashew nuts. Comprehensive integrated farming and the average production and dissemination of this research sample is based on the pattern of diversified integrated farming developed Cashew farmers in Muna can be presented in table 2 :

Table. 2. Average area, production and sample according to the pattern of Diversified Farming Systems Integrated Cashew in Muna

No	Integrated Farming Patterns	Average Size (Ha)	Production (ton/ha)	Frequency Farmers	Percentage (%)
1	A	1,67	1,533	30	23,08
2	B	2,50	2,300	23	17,69
3	C	2.56	2,533	30	23,08
4	D	1,75	1,300	27	20,77

5	E	1,37	0,800	20	15,38
Total				130	100,00

Information :

- A = integrated farming pattern cashew / - edible plant
- B = integrated farming pattern cashew - livestock Horses
- C = pattern integrated pattern cashew - cattle
- D = integrated farming pattern cashew - goats
- E = integrated farming pattern cashew – poultry

Based on Table 2 above shows that the mapping pattern of diversified integrated farming that has developed cashew farmers in Muna there are five (5) pattern. The highest proportion of respondents who Cashew farming patterns / corn / peanut / cassava (Pattern A) and the pattern of cashew farming / cattle corn + (pattern C) occupied respectively by 23.08%. While the proportion of the next integrated farming is the pattern of cashew / corn + Goat (pattern D) by 27 respondents or 20.77%. as well as cashew nut farming patterns / maize + horse (pattern B) of 23 respondents to the proportion of 17. 69%. And the lowest sampling is integrated farming pattern cashew crop / corn + poultry by 20% of respondents, or about 15:38. Mapping is not the same number of samples in each pattern of farming due cashew farmer groups who develop pattern-based integrated cashew farming has been degraded due to the high growing economic life of cashew nuts.

c. Revenues and Benefit-Cost Ratio draw Integrated Cashew farming diversification pattern developed by Farmer.

Analysis of the results of Integrated farming is farming performance measure either one or more commodities that are cultivated in an area / land. For farming involving various kinds of commodities or in integrated farming, the result is more than

monocultures. Improved farming performance is increasing the number of production produced and may have implications increase farmers' income. Farm production in this study is the result obtained by farmers in developing cashew farming well integrated with food crops or livestock integration is measured in ton / ha or tonnes / ha / year in the farm or livestock unit the integration of livestock and crop production per one.

Production of integrated farming plantations of Cashew in shell, cashew nuts and products, derivatives crops; corn and its derivatives (kg / biomass), groundnut seed and derivatives, wet and dry cassava in kg / ha. While the production of livestock and meat horse tail number as well as their social value, the number of cattle and beef and its derivatives, the number of tails and mutton and derivatives as well as the number of tails and broiler chicken meat and its derivatives as well as eggs.

Data analysis of the results of integrated farming developed cashew farmers in Muna with a sample of 130 people who were grouped in five categories of integrated farming. (analysis of revenue according to the pattern UTI). The recapitulation of the results of analysis developed integrated farming of cashew farmers in Muna can be described by patterns of farming as presented in the following table:

Table. 3. Summary Of Results Cashew Farming According To Integrated Farming Pattern Developed Cashew Farmers In Muna, 2016.

No	Pattern UTI	R	Cost (IDR.000)	Production (t/ha)	Price (IDR/kg)	Income (IDR.000)	Profit (IDR.000)	B/C
1	Pattern A	30	4.288.	1,533	17.000	26.067	21.778	4,89
2	Pattern B	23	4.568.	2,300	17.000	39.100	34.532	7,56
3	Pattern C	30	4.748.	2,533	17.000	43.061	38.313	8,07
4	Pattern D	27	3.344.	1,300	17.000	22.100	18.756	5,60
5	Pattern E	20	2.626.	0,80	17.000	13.600	10.974	4,18
Total		130	15.547	8,466		143.964	128.311	42,49

Based on Table 3 above can be explained that the expenses of production facilities, production and income varies from cashew nut highest in integration patterns cashew-cattle (Pattern C) with an average profit IDR.38.313.000 and the ratio B / C 8 , 07 and the second highest in the pattern cashew farm-horse (pattern B). With the amount of production per hectare per year showed that an average of 2,300 tonnes / ha with the reception of IDR. 39.1 million - with an average profit of IDR. 34.532 million, - thus that the cost benefit ratio (B / C) indicates the value of the benefits and feasibility of integrated farming pattern C is 8.07. whereas the lowest of the above table are (pattern E)

with the value of the average income of IDR. 13.6 million, area 0.80 ha.

It is possible that a combination of subsistence farming still category is integrated farming cashew crop to crop and livestock integration horses (Pattern A and Pattern B). The combination of cashew crop farming with crops and cashew crop integration patterns with horses still subsistence for farming management not using technology fully.

IV. CONCLUSION

Found two prototype and five diversified integrated farming pattern that has developed the prototype of cashew farmers Integrated farming of various crops (Multiple Cropping) method horizontal adaptive diversification - autotrophic and prototype Integration Integrated crop-livestock farming (Multiple integration) with diversified methods Vertical coordinative nature mutual- herbiforik. Performance of diversified integrated farming pattern developed cashew farmers on the island of Muna is integrated farming Subsistence level Facultative namely cashew integrated farming pattern - edible plants and integrated farming patterns Cashew // HMT + Horse and integrated farming Commercial level namely (a) Patterns integrated farming cashew / HMT + Ox, (b) cashew // HMT + Goat (c) cashew / corn + Poultry.

Integrated farming commercial level different significance than the subsistence level Facultative. The highest revenues in integrated farming cashew integration patterns - a cow with an average profit of IDR. 38.313 million and benefit-cost ratio (B / C) = 8.07 and the lowest in integrated farming pattern patterns pink mete- E integration birds with an average income of IDR. 10.974 million and the benefit-cost ratio B / C is 4.18.

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