PERFORMANCE OF CORN AGROINDUSTRY BUSINESS AND REGIONAL DEVELOPMENT ON NORTH CENTRAL TIMOR REGENCY OF INDONESIA

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ABSTRACT

Agricultural commodities, including maize are perishable commodities, to maintain the use value requires processing into certain products. Corn agro-industry processes corn into sticks, crackers, chips, and tortillas. The location of agro-industry is adjusted to the availability of raw materials, labor and agglomeration. The study aims to: (1) to compare the performance of agroindustry which processed corn products, (2) analyze their relationship with the regional development of the TTU Regency. The method used for data analysis are Likert Scale and descriptive statistics. The results showed that the business performance of corn crackers was in the high category, while the business of corn sticks, corn chips, tortillas were in the medium category. The high performance of the agroindustry business contributes more to regional income, income equity, economic linkages, the inflow of funds in TTU Regency, as the indicators of regional development.

Key words: corn agroindustry, performance comparison, regional development

I. INTRODUCTION

1.1. Background

Agricultural commodities are generally produced as raw materials and easily damaged, so they will be consumed or processed first. The willingness of consumers to pay the price of small industrial output at a relatively high price is an advantage for the small processing industry to produce industrial output.

Processing of agricultural products is generally carried out by small industries known as agro-industries. Agroindustry is an effort to create a processed product in the form of finished goods and semi-finished goods whose main raw material is agricultural products (Soeharjono, 2001). Corn can be processed into various processed products. One of the corn processed products that is favored by many consumers is corn sticks (Mangunwidjaja, 2003). The processing process of this product is quite simple so that it has the opportunity to be adopted by rural communities, especially women farmers as home industries.

Corn as a staple food has good nutritional value. In addition to its carbohydrate content, 63.60 percent also contains fat with high saturated unsaturated fatty acids, 7.90 percent protein, minerals and vitamins; including high vitamin A content compared to other types of seeds (Ahmadi, 2009). Nevertheless the production and nutrient content of corn has not been used optimally (Mahendradatta and Tawali, 2008). One way to increase the value added of corn products is to process it into various kinds of processed corn products (agro-industry).

The growing agroindustry shows the transition of rural communities to urban areas as stated by Whynne-Hammond (1979) in Rustiadi (2011). Agro-industry of corn processed products

that develop in TTU Regency in the form of corn sticks, corn crackers, corn chips and tortillas. These products are generally processed by small industries and home industries.

The prasurvey showed that the location of agro-industrial processed corn products spread fairly evenly in TTU Regency. There are 8 corn processing agroindustry units in TTU Regency consisting of 1 corn stick business unit, 5 corn cracker business units, 1 corn chips business unit and 1 tortilla business unit.

The corn agro-industry are able to create jobs and increase added value which are several measures of agro-industry performance. The performance of corn agroindustry differs between 1 type of business and other types of businesses. The performance of corn agroindustry is related to the contribution to regional income and business linkages which are indicators of regional development. This study is important to analyze the performance of corn agroindustry and regional development.

1.2. Formulation of the research problem

Based on the background, some problems can be formulated as follows:

1. How do you compare the performance of corn processing business to corn sticks, corn crackers, corn chips and tortillas on North Central Timor Regency?

2. How does the corn processing business contribute to the regional development of the North Central Timor Regency?

1.3. Research purposes

Based on the research problem, the research objectives are:

1. To compare the performance of each type of corn processing business (corn sticks, corn crackers, corn chips and tortillas) in the North Central Timor Regency.

2. To analyze the contribution of corn processing business to the development of the North Central Timor Regency.

1.4. The Benefits of research

The benefits of this research are:

1. As a source of knowledge on the performance of various types of corn processing into corn crackers, corn chips, corn sticks and tortillas.

2. As a contribution of research to North Central Timor Regency

3. As a reference for other researchers interested in the same field.

II RESEARCH METHOD

2.1. Place and Time of Research

The study was conducted on North Central Timor Regeny of Indonesia in April to September 2018.

2.2. Population and Sample

The population in this study were corn stick business (1 unit), corn cracker business (5 units), corn chips business (1 unit) and tortilla business (1 unit). The research sample was 1 business unit for each type of corn processing, so the number of samples was 4 business units. The sample technique used is disproportional stratified random sampling. Furthermore, a sample of 20 respondents came from workers and customers for each type of processing business. Determination of sample respondents by purposive sampling.

2.3. Data collection

The data collected in this study consisted of primary data and secondary data. Primary data were obtained from interviews directly to the respondent using a prepared questionnaire. Whereas secondary data is obtained from available data at each business unit and related agencies such as the Industry and Trade Institute, as well as the literature related to this research.

2.4. Data analysis

Data analysis was conducted to answer research problems. The first problem is analyzed using several stages. First, descriptive analysis to measure the performance of each type of corn processing business. The second stage of comparative performance analysis uses a Likert Scale for comparison. Comparison between businesses for each component/criterion uses a Likert Scale which is made in 3 categories as follows:

> 1: component performance is not good if the value is lower than the minimum value
> 2: medium component performance if the value is between the minimum and maximum values
> 3: high component performance if the value is higher than the maximum value

Note:

Determination of minimum and maximum values using average data and standard deviation (SD), namely SD ± Average. The standard deviation is determined by the formula:

$$SD = \sqrt{\frac{\sum (Xi - Xbar)^2}{n-1}}$$

Furthermore, the total value of performance comparison is done by summing the value of each component of the performance of each type of corn processing business (sticks, crackers, chips and tortillas). Criteria for determination are carried out in the following ways:

$$\text{Class interval} = \frac{(maxsimum\ value - minimum\ value)}{number\ of\ category}$$
$$= \frac{27-9}{3}$$
$$= 6$$

Criteria the total performance:

> The low performance categories   : 10-15
> The medium performance categories : 16-21
> The high performance total category : 22-27

The second problem was answered by descriptive analysis to relathionship the performance of agro-industry with regional development in North Central Timor Regency. Regional development indicators associated with contributions to the regional economy, business linkages, equal distribution of income, regional inflow and outflow of North Central Timor Regency.

III. RESULTS AND DISCUSSION

3.1. Comparative Analysis of Corn Agro-Industry Business Performance
3.1.1. Input and Input Costs

Input are a number of production factors used to produce a particular product. The inputs used for corn agroindustry business in general consist of business capital, raw materials, auxiliary

materials, equipment, labor, marketing, value added, benefit and R/C ratio. Inputs that have been given a value are called costs (Reksoprayitno, 2000).

a. Venture capital

Business capital is input in the form of money used in producing a product. The corn agroindustry business capital is around Rp. 500,000 up to Rp. 1,000,000. Capital issued by each type of agro-industry business results in greater (profitable) revenue. The highest capital performance is a corn cracker business with an income of Rp. 28.80 for each rupiah issued. The performance of business capital in a row are tortillas, corn sticks and corn chips. Details of business capital performance are shown in Table 1.

Table 1. Comparassion of Venture Capital Performance of Corn Agroindustry Business on North Central Timor Regency of 2017

No	Corn Product	Venture capital (Rp)	Capital performance
1.	Corn Sticks	500,000	7,20
2.	Corn cracker	500,000	28,80
3.	Corn chips	500,000	4,80
4.	Tortillas	1,000,000	14,40

b. Raw materials and auxiliary materials

Inputs used are corn as raw material and several types of auxiliary materials. The cost of raw materials is the value of all business inputs in processing corn into corn sticks, corn crackers, corn chips and tortillas. According to Riadi (2012) the cost of raw materials is the cost directly costs which, used in production to realize a variety of finished products that are ready to be marketed.

Every raw material cost incurred will get a certain revenue that describes the performance of raw materials. The corn chip business has the lowest performance compared to other businesses with a value of Rp 20.00 for every rupiah raw material costs. The performance of raw material costs for other types of agro-industry businesses (tortila, corn sticks and corn crackers) is the same, namely 50.00. The details are shown in Table 2.

Table 2. Comparassion Performance of Material Cost on Corn Agroindustry Business in North Central Timor Regency of 2017

No	Corn product	Material cost (Rp)	Material cost performance
1	Corn Stick	72,000	50,00
2	Corn cracker	288,000	50,00
3	Corn chips	120,000	20,00
4	Tortillas	288,000	50,00

Other materials besides raw materials which also form the processed products of corn (sticks, crackers, chips and tortillas) are known as auxiliary materials. The auxiliary materials used to produce the processed corn products are mostly the same and a little different.

Stick corn using auxiliary materials in the form of finished spices, salt, tapioca flour, whiting and cooking oil. Corn crackers use auxiliary materials in the form of finished spices, salt, tapioca flour, whiting and cooking oil. Corn chips use auxiliary materials in the form of finished

spices, salt, tapioca flour, whiting and cooking oil. Tortillas use auxiliary materials in the form of finished spices, salt, tapioca flour, whiting and cooking oil.

The value of auxiliary materials from each processed product varies, as well as its performance in producing products, marketing, values added, and benefits. The results of the analysis showed the highest performance of corn cracker auxiliary materials compared to auxiliary materials from other agro-industry businesses (tortillas, corn chips, corn sticks). Comparison of performance of auxiliary materials is shown in Table 3.

Table 3. Comparassion Performance of Auxiliary Materials of Corn Agroindustry Business North Central Timor Regency of 2017

No	Corn product	Auxiliary Materials Values (Rp)	Auxiliary Materials Performance
1	Corn sticks	936,000	3.85
2	Corn crackers	2,244,000	6.42
3	Corn chips	612,000	3.92
4	Tortillas	2,880,000	5.00

c. Equipment

The technology used by each type of agro-industry is simply technology. The type of equipment used for processing corn sticks and corn crackers is the same; namely basin, silk, cauldron, mole noodles, hook stove, scales. The equipment for processing corn chips includes hooks stove, cauldrons, scales, sieves, silk, slippery zinc, pans, basins. The equipment for processing tortillas is mole noodles, mortar, cages, basins, silk.

Equipment costs are calculated using a depreciation approach because the equipment used experiences depreciation for each use. Depreciation values do not differ greatly between the types of processed corn products business, but their performance is quite far apart as shown in Table 4. The performance of the equipment used by the tortilla business is the highest (136.28) compared to the performance of other types of businesses which performance values are below 100.

Table 4. Comparassion Performance of Equipment Cost of Corn Agroindustry Business on North Central Timor Regency of 2017

No	Corn product	Equipment cost (Rp)	Equipment cost performance
1	Corn sticks	144,583	24,90
2	Corn crackers	159,333	90,38
3	Corn chips	117,266	20,47
4	Tortillas	105,666	136,28

d. Labor

Workers who work in every type of corn agroindustry business range from 1 dd. 8 people. The largest number of workers in the tortila business is 8 people and in a row are 4 corn crackers, 2 corn crackers, and 1 corn stick business. The labour used is laboring in the family. Workers wages are not calculated because the agro-industry is a family business.

The performance measure of the agro-industrial workforce uses labor productivity as stated by Mathis and Jackson (2006) that performance is basically what employees do or don't do.

The measure of labor productivity as one indicator measure as stated by Robbins (2006) that indicators of individual employee performance measurement can be based on several indicators, namely quality, quantity, timeliness, effectiveness and independence.

Based on labour productivity indicators in producing products for each agro-industry; labor performed in corn cracker business is the highest compared to other agro-industry businesses. Every labor in corn cracker business produces a product value (revenue) of Rp. 7,200,000, while the lowest is the performance of a corn chips emperor whose workforce gains Rp. 600,000. Summary of the comparison of labor performance is shown in the table 5.

Tabel 5. Comparassion performance of labour on Corn Agroindustry Business in North Central Timor Regency of 2017

No	Corn Product	Labour (men)	Performace of labour (Rp)
1	Corn sticks	1	3,600,000
2	Corn crackers	2	7,200,000
3	Corn chips	4	600,000
4	Tortillas	8	1,800,000

3.1.2. Marketing

Performance

The product of corn agro-industrial business are expected to be marketed at a selling price that benefits and is acceptable to consumers. However, the constraints on the price of the products of agro-industrial businesses generally cannot be controlled by these efforts (Downey and Erickson, 1998) or in other words, agro-industrial enterprises are relatively price takers, not price makers. This condition also determines the marketing performance of each corn agroindustry product. The corn agroindustry performance indicator is based on a comparison between the number of products sold and the number of products produced.

The results showed the highest marketing performance of corn chips (100%) compared to other corn industry businesses which 96%, 76,39% and 72,92% (Table 6). The whole corn chips product was sold because it was marketed to trading businesses near the agro-industrial location and located far to the cities of Kefamenanu and Atambua.

Tabel 6. Comparassion of Marketing Performance on Corn Agroindustry Business on North Central Timor Regency of 2017

No	Corn Product	Amount of product	Amount of marketed	Performance (%)
1	Corn sticks	550	720	76,39
2	Corn crackers	2400	2400	100
3	Corn chips	350	480	72,92
4	Tortillas	2496	2400	96,00

3.1.3. Added Value and Relative Benefits

a. Value-added

Tarigan (2005) states that income calculation uses several approaches, namely: expenditure approach, income approach, and value added approach. Furthermore, it is said that value added is obtained from wages or salaries, land rent, interest on money, and profits or business

profits. The measurement of the benefits of agro-industry businesses uses a value-added approach. Products of good quality, the price will be higher and will eventually increase the value added obtained as stated by Soehardjo (1991).

The result showed the highest value added is the business of corn chips compared to other processed corn products (sticks, crackers, and tortillas). Value added shows the performance of all resources owned by each business of processed corn products. The details of the performance four types of corn bussines are shown in Table 7.

Table 7. Comparison of Value Added on Corn Agroindustry Business in North Central Timor Regency of 2017

Corn Product	Product Value (Rp)	Cost(Rp)			Value added (Rp)
		Cost of row materilals	Cost of auxiliary materials	Depreciation of equipment	
Corn sticks	4,050,000	72,000	936,000	144,583	2,897,412
Corn crackers	10,000,000	288,000	2,244,000	159,333	7,308,667
Corn chips	10,000,000	120,000	612,000	117,266	9,150,734
Tortillas	10,000,000	288,000	2,880,000	105,666	6,726,334

b. Relative advantages and benefits

The advantages of the business of corn sticks and corn chips are in the range of one million rupiah, in contrast to the profits of the business of corn crackers (Rp. 10,509,000 -) and tortillas (Rp. 9,926,000). The benefits obtained by each agro-industry business also show the performance of each type of agro-industrial business. Agro-industrial performance can also use the relative profit value calculated using the R/C ratio as shown in table 8.

Table 8. Comparison of R/C ratio on Corn Agroindustry Business in North Central Timor Regency of 2017

No	Corn product	Revenue (Rp)	Costs (Rp)	Profit (Rp)	R/C ratio
1	Corn sticks	3,600,000,-	1,752,583,-	1,847,417	2,05
2	Corn crackers	14,400,000,-	3,891,000,-	10,509,000	3,70
3	Corn chips	2,400,000,-	1,089,266,-	1,310,734	2,20
4	Tortillas	14,400,000,-	4,473,666,-	9,926,334	3,22

The results showed that the R/C ratio of all types of corn processed products is greater than 1 (R/C ratio> 1) which means profitable. The highest value of R/C ratio in corn cracker business which achieved a value of R/C ratio of 3.70 which means that every rupiah the cost incurred will receive revenues of 3.70 rupiah.

3.2. Agroindustry and Regional Development Performance

3.2.1. Summary of Comparison of Corn Agro-Industry Business Performance

The performance of corn agroindustry obtained from input indicators (capital, raw materials, auxiliary materials, equipment, labor), marketing, value added and profit varies. A summary of the performance of each type of agro-industry business is shown in Table 9.

Table 9. Summary Performance Of Corn Agorindustry Business on North Central Timor Regency of 2017

No	Performance component	Stick	Crackers	Chpis	Tortillas
1	Capital	7,20	28,80	4,80	14,40
2	Raw materials	50,00	50,00	20,00	50,00
3	Auxiliarly materials	3,85	6,42	3,92	5,00
4	Equipment	24,90	90,38	20,47	136,28
5	Labour	3.600.000,00	7.200.000,00	600.000,00	1.800.000,00
6	Marketing	76,39	100,00	72,92	96,00
7	Value added	2.897.412,00	7.308.667,00	9.150.734,00	6.726.334,00
8	Profit	1.847.417,00	10.509.000,00	1.310.734,00	9.926.334,00
9	R/C ratio	2,05	3,70	2,20	3,22

The summary of the performance of the corn agroindustry business as shown in table 9 can be used as an index so that it can be compared. The approach uses a statistical approach to determine the average value and standard deviation of each component of performance. Then, using the Likert Scale with 3 categories, namely:

1 = less performance; 2 = medium performance; 3 = high performance

Tabel 10. Criteria for Determining Performance Classification for Each Component of Corn Agro-Industry Performance

No	Performance Component	Standar Deviasi	Avarage	Minimum	Maximum
1	Capital	10,80	13,80	3,00	24,60
2	Raw materials	15,00	42,5	27,50	57,50
3	Auxiliarly materials	1,20	4,80	3,60	6,00
4	Equipment	55,62	68,01	12,39	123,62
5	Labour	2.877.498,91	3.300.000,00	422.501,09	6.177.498,91
6	Marketing	13,65	86,33	72,68	99,98
7	Value added	2.627.322,60	6.520.787	3.893.464,15	9.148.109,35
8	Profit	4.997.967,16	5.898.371	900.404,09	10.896.338,41
9	R/C ratio	0,80	2,79	2,00	3,59

Based on the 9 criteria as shown in Table 15, the performance of the corn cracker business is high on the criteria of capital, auxiliary materials, labor, marketing and relative profit (R/C ratio). The performance of corn chips is high on value added and marketing. The tortila business performs high on equipment and marketing criteria. The criteria for the performance of the business of corn sticks are generally moderate, except for the value added that is classified as lacking. Likewise the performance of raw materials in the low-grade corn chip business. The conclusion is that a corn processing business is classified as low, medium and high performing using the following criteria:

The low performance category : 10-15
The medium performance category : 16-21
The high performance category : 22-27

Table 11. Summary of Comparison Performance Corn Agorindustry Business on North Central Timor Regency of 2017

No	Performance Component	Stick	Cracker	Chip	Tortilla
1	Capital	2	3	2	2
2	Raw materials	2	2	1	2
3	Auxiliarly materials	2	3	2	2
4	Equipment	2	2	2	3
5	Labour	2	3	2	2
6	Marketing	2	3	2	2
7	Value added	2	3	2	2
8	Profit	1	2	3	2
9	R/C ratio	2	2	2	2
	Total	17	23	18	19

The data in table 11 shows comprehensively the performance of corn crackers business is classified as high performance, while the performance of other businesses (tortila, corn chips, and corn sticks) is classified as medium. This condition occurs because the management of corn cracker business is better than the management of other businesses of corn agroindustry.

3.2.2. Descriptive Relationship Between Agro-Industry and Regional Development Performance in North Central Timor Regency

The relationship of agro-industry performance and regional development in a region can be seen from several indicators. The intended indicator is the contribution to the value of regional income from the manufacturing industry sector, business linkages, income distribution, cah inflow and outflow on the region.

a. Contribution of corn processing business on regional development in North Central Timor Regency

Every economic activity in a region including corn processing business into sticks, crackers, chips and tortillas contributes to the regional economy in North Central Timor Regency which is one indicator of regional development. The total income of the corn processing business is Rp. 23,593,500, - or the average for these businesses is Rp. 5,898,300.

The number of corn processing businesses in North Central Timor Regency is 8 business units, which means that the regional income directly contributed by the corn processing business is

Rp. 47,186,400, or 0.13% of the total manufacturing industry revenue in North Central Regency which amounts to Rp. 36,119,100,000. , -

The performance of corn processing business into corn crackers is the highest compared to other businesses that have an impact on its contribution to the value of Product Domestict Product Bruto (PDRB) in the manufacturing sector. The analysis results shown in Table 12 show that corn crackers have a higher contribution than other businesses.

Table 12. Contribution of Corn Processing Business in Regional Economies of North Central Timor Regency in 2017

No	Type of bussines	Income of corn processing business	Contribute to PDRB processing industry sector
1	Stick	1,847,400,-	0.0052
2	Cracker	10,500,000,-	0.0291
3	Chip	1,310,700,-	0.0036
4	Tortillas	9,926,300,-	0.0275
	Total Sample	23,593,400,-	0.0653
	Total Population	47,186,400,-	0.1306

b. Linkages of corn processing businesses and other business

Corn processing business into sticks, crackers, chips and tortillas in addition to directly contributing to the value of the income of the processing industry in TTU Regency, also contributes to the development of other economic sectors. The related linkages include forward linkages and backward linkages.

Backward linkages with providers of raw materials and auxiliary materials, while the future linkages with retailers. This linkage can be done with businesses in the same regency, which can also be related to other businesses in other regency. Data on the relationship between maize processing businesses in North Central Timor Regency are shown in Table 13.

The results summarized in Table 13 show the impact of agro-industry performance, especially marketing. The corn cracker business has a more business relationship because it has marketing opportunities in Ponu (Biboki Anleu Subdistrict), Kaubele (Biboki Moenleu Subdistrict), Wini (Insana Utara Subdistrict), Kefamenanu (th Capital Of North Central Timor Regency) and Atambua (the Capital of Belu Regency). Other corn processing businesses (sticks, chips and tortillas) have a marketable range that is limited to the location of production and marketed to Kefamenanu City.

Table 13. The Linkages of the Corn Agroindustry Business on North Central Timor Regency in 2017

Corn product	Business Location	Backward Linkages	Forward Linkages
Stick	Bikomi Selatan Sub district	Raw materials and auxiliarly materials from market on Kefamenanu city	Distributor on Kefamenanu city and Southest Bikomi sub district
Cracker	Biboki Anleu Sub District	Raw materials and auxiliarly materials from market on Ponu	Distributor on Ponu, Kaubele, Wini, Kefamenanu, and Atambua
Stick	Kefamenanu city	Raw materials and auxiliarly materials from market of Kefamenanu city	Distributor on Kefamenanu city
Tortilla	Insana Barat Sub District	Raw materials and auxiliarly materials from market Kefamenanu city and market Maubesi nearby Kefamenanu city	Distributor on West Insana Subdistrict and Kefamenanu City

These agro-industries grew and developed because of the availability of raw materials, labor and agglomeration as well as the Location Theory introduced by Weber in Adisasmita (2005). Agroindustry of processed corn products was established in the Kefamenanu City and southern Bikomi because of symptoms of agglomeration. Agroindustry established in West Insana is more due to the location of excess raw materials. The corn cracker agroindustry which has the highest performance is located in Biboki Anleu because it is close to raw materials, labor is available and there are symptoms of agglomeration in nearby cities.

c. Equitable income

The number of workers absorbed by the corn agro-industry is 13 people in 4 business units or on average each business employs 3 workers. The number of workers absorbed the most is the tortilla business, which is 8 people and the least is in the corn stick business, which is as many as 1 person.

Every labour in each type of corn processing business receives remuneration for the income earned. However, there is an income gap between workers in each type of business because the average income of corn cracker business workers reaches Rp 5,254,500, while the average income of corn crackers reaches only Rp 327,675. This condition shows the performance of corn processing businesses contributing to the income gap in TTU District. The full results are shown in figure 1. Other community groups and other regions actually contributes to income distribution.
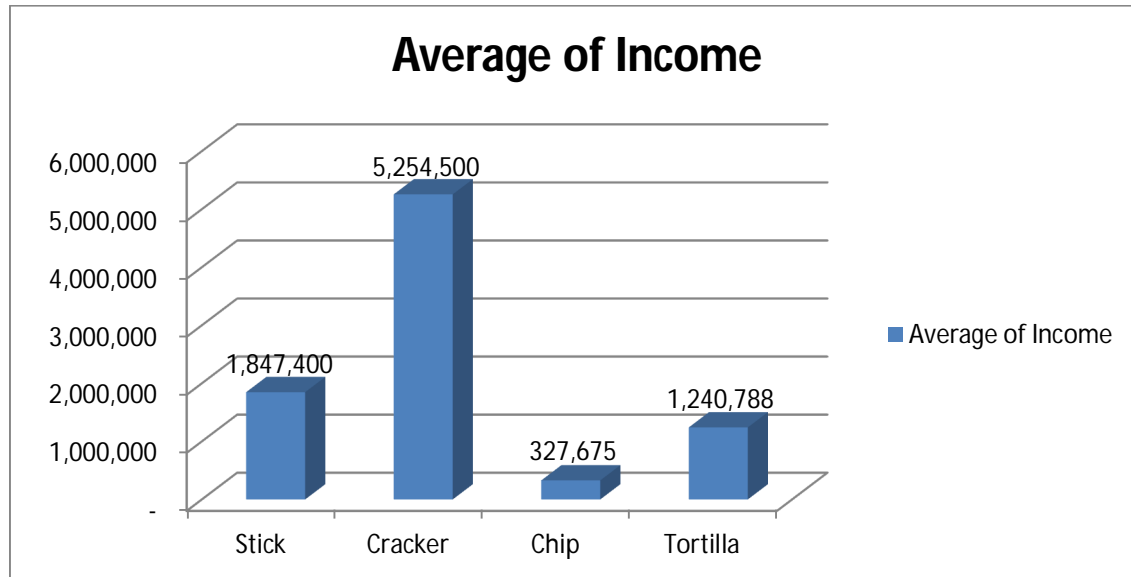
Average of Income

Figure 1. Average Income Per Type Of Corn Processing Business

d. Flow of Funds in and Out of TTU Territory

Businesses that buy raw materials and auxiliary materials from outside North Central Timor Regency will increase the outflow of North Central Timor Regency which means causing regional leakages. On the other hand, businesses that sell their products outside of North Central Timor Regency will increase the inflow into North Central Timor Regency.

The results of the study as shown in table 13 state that the corn cracker business is bringing funds to North Central Timor Regency because the products are sold to Atambua (the Capital of Belu Regency). Other businesses (sticks, chips and crackers) are not marketed out so that they have not been able to increase the inflow of funds to North Central Timor Regency. This condition shows the relationship between the performance of agro-industry and regional development in North Central Timor Regency.

IV CONCLUSIONS AND SUGGESTIONS

4.1. Conclusion
The conclusions in this study are:
1. The performance of the corn cracker agroindustry is in the highest category, while the corn chips, tortillas and corn sticks are of medium performance.
2. The high performance of corn cracker agro-industries have a positive relationship descriptive with contributions to regional income, business linkages, inflow of funds, and income equity in North Central Timor Regency. Nevertheless contribute to income disparity in corn agroindusry business.

4.2. Suggestion
The performance of corn processing business into sticks, crackers, crackers and tortillas can be improved by:
1. Continuity of production is recommended to continue to gain market trust
2. Increased use of capital and technology can increase production
3. Expansion of market share

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