

Agro-Industry Value Chain of Green Products Processed Aloe Vera in Pontianak

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ABSTRACT

This paper introduces the agro-industry value chain of processed aloe vera in Pontianak, West Kalimantan, Indonesia. For this purpose, the authors have identified the complete value chain from producers (farmers / processors), traders, end consumers and policy makers. Finally, the national product is described in the context provided by the international market. The results showed that the performance of each of the actors of the value chain to work effectively so that consumers feel the best service with the product received while producers gain increased competitiveness and profitability.

Keywords: Value Chain, Green Products, Aloe Vera Agro-Industry

JEL Classification: Q1, Q13.

INTRODUCTION

The aim of the supply and value of the chain is to optimize performance which uses a collaboration and capabilities of the members in the chain. The success of the chain is depended on the integration, coordination and communication between partner with the success of the traditional measure into the return on the investment investment (O'Keefe 1998; Boehlje 1999; Dunne, 2001, Bryceson & Kandampully 2004). The value which is integrated with supply chain, strategic alliances between the series of independence business is merged as one unit which is able to utilize the opportunities of the market (Cox 1999).

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Value chain in this case means creating value which is added at each link in the chain which may give advantages for business in the chain. The way of how the actual value is created is the main concern for the business. Porter (1985) states that value can be formed by classified every step of the value chain which is able to stimulate the buyer to buy and improve the performance of the buyers . In most of the production, the process of creating focused on the commodities and moreover generic characteristic and the consequences create small profit for the producers. The value chain management are green products processed aloe that has led to a green economy with the resulting product is a beverage, dodol, tea, crackers and jelly.

When the basic concept of the value chain is not multipart, explicit characteristic and mapping of the value is important as a comparison. Analysis of agro-industry supply chain has become a precious instrument in formative return (Beamon, 1998, 1999). In order to generate industry, Chain Lean of Lamming (1996) and Womack and Jones (1996) Most of the analysis regarding to supply chain tends to direct on quantity of the stock and flow of product, information and financial factors and how to deal with it in a way to bring to the better business strategies which may lead to innnovative value added and competitive advantages, sustaibnable production and professional education(Govindarajan and Trimble 2005), competitive advantage (Porter 1985), sustainability (Svensson 2007) or managerial education (Dunne 2004).

RESEARCH METHOD

This study uses an explanatory study is a research method to retrieve data from the sample and questionnaire as a data collection tool. Once the data is obtained, the results are explained in the explanatory, and the data were analyzed to test the hypothesis proposed at the beginning of the study (Creswell, J. W, 1992). Determination of the sample using multistage sampling technique for sample consists of several parts: a sample of small entrepreneurs, merchants sample, a sample of consumers and policy makers samples (Ferdinand Augusty, 2014). This study uses primary data that needs to be done to test the validity and reliability of data with a minimum requirement considered valid if the instrument has a value of $r \geq 0.3$. Overall coefficient $r \geq$ variable has a value of 0.3, meaning that valid research instruments. Data Analysis using SEM method

- a. Development of a model
- b. Development of flowcharts
- c. Conversion Flowchart into the equation SEM

Selection of input matrix and estimation techniques

This study will examine causality, so that the matrix is used as input SEM is a covariance matrix. Covariance matrix is used for the explanation or prediction of phenomena being studied. The estimation technique used is the maximum likelihood accordance with the provisions of the samples tested is a total of 100 up to 200.

Assessing the problem of identification

Identification of the problem would seem to circumstances where the standard error for one or several coefficients is very large or very high correlation between the coefficients (> 0.9).

Evaluation of models

In this step the accuracy of the model was evaluated, through the stages of various criteria for goodness fit. Conformance test models as follows:

Table 1. Goodness Of Fit

Goodness Of Fit Indeks	Cut Of Value	Compatibility Level Can Be Accepted
X ² - chi square	<df with $\alpha= 0,05$	$\chi^2 / df > 5$
RMSEA	$\leq 0,08$	RMSEA $\leq 0,08$ (good fit) RMSEA $< 0,05$ (close fit)
GFI	$\geq 0,95$	$0,80 \leq GFI \leq 0,9$ (marginal fit)
AGFI	$\geq 0,95$	$0,80 \leq AGFI \leq 0,9$ (marginal fit)
CMIN/DF	$\leq 2,00$	-
TLI	$\geq 0,95$	-
CFI	$\geq 0,95$	CFI $> 0,9$ (marginal fit) CFI $\geq 0,95$ (good fit)

(Ghozali, 2013)

Interpretation models

After going through the compatibility test, researchers still can make modifications to the model that was developed when it appeared that some requirements are not met. Hypothesis is a formulation while on a matter that is made to explain it and also can lead / directing further research.

Research Result

Validity and Reliability Test

Overall results of the questionnaire are worth more than ≥ 0.3 it can be concluded that the questionnaire is valid. According Priyatni (2010), if the count $r \geq r$ table the instrument or item-item questions correlated significantly to the total score (declared valid). If r count $> r$ table the instrument or item-item question did not correlate significantly to the total score (declared invalid).

Reliability test value worth more than 0.6 for all the variables studied. The results showed that all variables are reliable. According Priyatno (2010), Cronbach's Alpha method is suitable for use on a score form scale or range. Reliability testing typically uses such restrictions as 0.6. The reliability of less than 0.6 is unfavorable, while 0.7 is acceptable and above 0.8 is good.

RESULTS AND DISCUSSION

Analysis of Structural Equation Modeling (SEM)

1. Confirmatory Factor Analysis Off Farm

Confirmatory factor analysis is the phase variable measurements to the dimensions of forming the latent variables in the research model. Latent variables or constructs used in the study consisted of two models with the total dimensions are 18 variables. Interest confirmatory factor analysis was to examine the dimensions of forming respective latent variables.

a. Confirmatory Factor Analysis- Exogenous Construct

Exogenous construct confirmatory factor analysis conducted to see whether these indicators is the gauge factor is concerned. Results of confirmatory factor analysis processing exogenous construct is shown in Figure 1 and the results are presented in Table 2

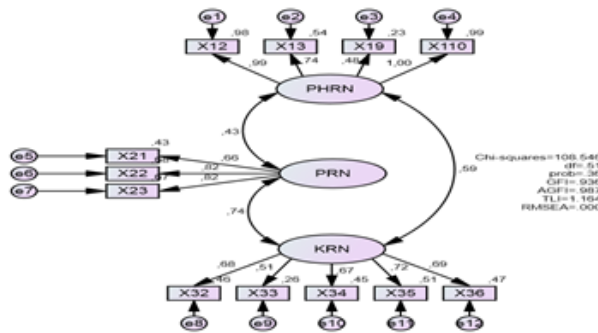


Figure 1. Confirmatory Testing Results Exogenous Construct Factors Aloe Vera Agroindustry (Off Farm)

Table 2. Summary of Confirmatory Factor Analysis Exogenous Construct Aloe Vera Agroindustry (Off Farm)

Variable	Estimate	S.E.	C.R.	P	Label
Cost barriers (X12)	1,000				
Lack of knowledge (X13)	,858	,076	11,216	***	par_1
Barriers to business management (x19)	,576	,102	5,630	***	par_2
Barriers quality of human resources (X110)	1,005	,021	48,556	***	par_3
Timely delivery (X21)	1,000				
Contacting the end user (X22)	1,213	,181	6,698	***	par_4
Developing technologies (X23)	1,315	,199	6,622	***	par_5
Timely product delivery (X32)	1,000				
Respond to customer needs (x33)	,806	,166	4,848	***	par_6
Its partnership with key suppliers (X34)	,884	,151	5,868	***	par_7
The ability to design products (X35)	1,061	,177	5,987	***	par_8
Promoting green products (x36)	,837	,143	5,869	***	par_9

Source: primary data analysis, 2015

Latent variables or exogenous construct on the research model consists of three latent variables that concern the value chain by four indicators, the practice of the value chain with 3 indicators and competence of the value chain by 5 indicators. Furthermore, Table 2 shows that there are six variables that were analyzed did not provide significant results, namely X11, X14, X15, X16, X17 and X18. While variable X12, X13, x19, X110, significantly influence the value chain attention. Variable X21, X22 and X23 significant effect on the value chain practices. Variable x32, x33, X34, X35 and x36 significant effect on the competence of the value chain. Each variable has a value of $CR \geq 2.00$, standardize factor loading ≥ 0.5 and $p \leq 0.05$.

b. Confirmatory Factor Analysis – Endogenous Construct (Off Farm)

Endogenous latent variables or constructs in the research model consists of two constructs that increased activity of the value chain with six indicators and the performance of the agro-industry with four indicators. Results of confirmatory analysis of endogenous constructs shown in Figure 2.

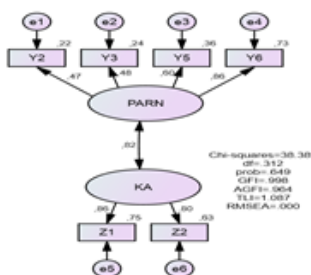


Figure 2. Testing Results of Confirmatory Factor Endogenous Constructs Aloe Vera Agroindustry

Table 3 shows that there are six endogenous variables have a significant effect. Variable Y2, Y3, Y5 and Y6 significant effect on the increase in the activity of the value chain, variable Z1 and Z2 also have a significant effect on the performance of the agro-industry.

Table 3. Summary of Factor Analysis Endogenous Agroindustrial Construct Aloe Vera Agroindustry

Variable	Estimate	S.E.	C.R.	P	Label
The price of the corresponding input (Y2)	1,000				
The timely flow of output (Y3)	1,056	,279	3,780	***	par_1
Price corresponding output (Y5)	1,141	,283	4,025	***	par_2
The flow of information (Y6)	1,884	,451	4,175	***	par_3
Increasing competitiveness (Z1)	1,000				
Increased profitability (Z2)	,891	,112	7,923	***	par_4

Source: primary data analysis, 2015

Factor loading value ≤ 0.5 , the probability and the value of $CR \geq 2.00$. Agroindustri aloe vera has a target to increase the activity of value chain actors and performance of agro-industries. Variable supporters described benefit agro-industry, for the development of agro-industries in the future could increase regional economic growth.

2. Analysis of Structural Equation Modeling (SEM)

After a confirmatory factor analysis, each indicator in a fit model, further analysis of Structural Equation Model (SEM). The result of the processing shown in Figure 3. It shows that the model according to research data.

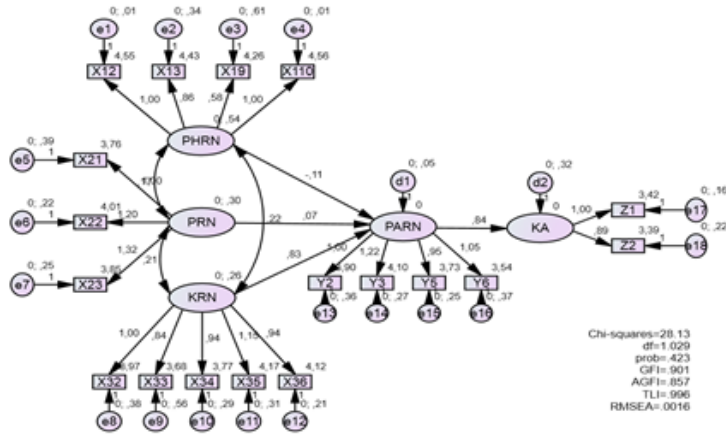


Figure 3. Results Testing of Structural Equation Model Aloe Vera Agroindustri (Off Farm)

The results of SEM model analysis indicated that the resulting value x2 is 28.13 and the value of p = 0.432 (Figure 3). These results support the null hypothesis that SEM has a good match (Ho). The p-value is very substantial (p values > 0.05), supporting the overall proportion that the model fits the data.

Table 4. Analysis Results Summary of Measurement Model of Aloe Vera Agroindustri

	Variable	Estimate	S.E.	C.R.	P	Label
ENHANCEMENT	<--- AVAILABILITY	-,110	,073	-1,509	,131	par_17
ENHANCEMENT	<--- KRN	,832	,246	3,383	***	par_18
ENHANCEMENT	<--- PRACTICE	,073	,144	,508	,612	par_20
KA	<--- ENHANCEMENT	,837	,213	3,925	***	par_19
X12	<--- AVAILABILITY	1,000				
X13	<--- AVAILABILITY	,858	,076	11,218	***	par_1
X19	<--- AVAILABILITY	,576	,102	5,630	***	par_2
X110	<--- AVAILABILITY	1,005	,021	48,510	***	par_3
X21	<--- PRACTICE	1,000				
X22	<--- PRACTICE	1,201	,178	6,742	***	par_4
X23	<--- PRACTICE	1,321	,198	6,662	***	par_5
X32	<--- KRN	1,000				
X33	<--- KRN	,840	,180	4,665	***	par_6
X34	<--- KRN	,937	,162	5,784	***	par_7
X35	<--- KRN	1,146	,189	6,068	***	par_8
X36	<--- KRN	,940	,157	5,999	***	par_9

Table 4 : (Cont.)

Y2	<---	ENHANCEMENT	1,000					
Y3	<---	ENHANCEMENT	1,216	,201	6,035	***	par_10	
Y5	<---	ENHANCEMENT	,946	,185	5,111	***	par_11	
Y6	<---	ENHANCEMENT	1,049	,218	4,814	***	par_12	
Z1	<---	KA	1,000					
Z2	<---	KA	,892	,160	5,586	***	par_13	

Source: primary data analysis, 2015

Based on the value of the path coefficient of each factor or supporting components of the value chain that is displayed on the model SEM image 3 and the results of analysis of regression weights in Table 4, the level of influence of each factor or component of the value chain to the increased activity of the value chain are presented in the form of structural equations as following:

$$ENHANCEMENT = - 0,110 ns AVAILABILITY + 0,073**PRACTICE + 0,832**KRN \quad (1)$$

Structural Equation 1 shows that no one factor or supporting component of the value chain showed a negative value which means that in the event of an increase in the availability of the value chain, the increased activity will decrease the value chain. While factors or supporting components of the value chain showed a positive value to the practice of the value chain and the competence of the value chain, which means that if there was an increase to practices and competencies that will enhance the increase in the value of the coefficient paths of factors increased activity on the performance of the agro-industry is shown in the form of structural equation as follows.

$$KIA = 0,837** ENHANCEMENT \quad (2)$$

The coefficient of the equation 2 shows that the positive values which means that if an increase in activity it will increase the performance of the agro-industry. Activities of value chain actors will encourage improved performance as it relates to the management of agro-industry input-output, synergy and value chain integrity. Both indicators are important for value chain actors are expected to work well for the achievement of the performance of agro-industries that were examined in terms of the progressive increase in diversification and efficiency of agro-industry, the progressive increase added value, increase profitability of agro-industry and increase marketing efficiency.

Table 5 shows the summary results of the measurement model agro-industry value chain of aloe vera to the increased activity of value chain actors and the performance of the agro-industry. These five variables studied were (practice, availability, competence, increased activity and performance of agro-industry). The value chain is valid on the respective concept because the concept of significant statistical parameters. Factor loading value of each indicator ≥ 0.5 is the value received in the research. Testing the significance of the dimensions extracted in the form of latent variables, derived from the value of the standardized loading factor of each dimension. Each indicator or dimension forming respective latent variables showed good results for the value of the critical ratio ≥ 2.00 . All the probability value for each indicator is < 0.05 . Thus it was stated that the indicators are strong in the measurement model.

The value of standardized regression weights indicate that when there is an increase in the independent variable, there will be an increase in the dependent variable for the coefficient value. The critical ratio value equal to the value of t-test, which means when compared with the value t count it all indicators which formed a significant effect. The analysis results shows that the attention of the value chain has no effect on the increase in activity due to the value of CR <2.00 and p values > 0.05. Indicators forming latent variables concern the value chain needs to be addressed because it affects the increase in activity. Weak availability due to the lack of a sense of trust among members of the value chain, the lack of cooperation, lack of information systems, weak ability to manage the inventory value chain, lack of interest among suppliers and customers, suppliers and customers within the region as well as the production of far-apart locations.

The assessment of goodness of fit is the main objective of structural equation is to determine how far the fancy models hypothesized “fit” or match the sample data. Goodness of fit analysis results are shown in Table 5.

Table 5. Goodness of Fit Index

Goodness of fit index	Cut-off value	Analysis Result	Model Evaluation
X ² chi-square	≥ Chi-Square Table	28,13	Good
Probability	≥ 0,05	0,423	Good
RMSEA	≤ 0,08	0,0016	Good
CFI	≥ 0,95	0,986	Good
GFI	≥ 0,90	0,901	Good
AGFI	≥ 0,90	0,857	Good
CMIN/DF	≤ 2,00	0,312	Good
TLI	≥ 0,90	0,996	Good

Source: primary data analysis, 2015

Table 5 shows that the test results of goodness of fit model indicate SEM produces fit in both criteria and marginal (approaching requirements). Structural index values of these statistics include CMIN / DF (0,312), GFI (.901), CFI (0.986), AGFI (.857), TLI (0.996), RMSEA (0.0016) which shows that the model has a satisfactory match. Because the probability value and structural model index is above the recommended level, this model is considered representations.

a. Reliability, Variance and Discriminant Validity Test

Reliability is one indicator of convergent validity. Reliability test indicates the extent to which a measuring instrument can provide relatively similar results when performed again on the same object. The minimum reliability value of dimensional forming latent variable that can be received is equal to 0.70, while the reliability 0,6-0,7dapat accept a validity indicator in either model. The results of reliability analysis, variance extract and validity determinant shown in Table 6.

Table 6. Reliability Construct Value, validity Determinant Variance Extract and Aloe Vera Agroindustry

Construct	Value		
	Reliability Construct	Extract Variance	Discriminant Validity
PRACTICE	0,7	0,5	0,7
KRN	0,8	0,5	0,7
AVAILABILITY	0,5	0,4	0,6
ENHANCEMENT	0,5	0,5	0,6
KA	0,7	0,5	0,7

Source: primary data analysis, 2015

Table 6 shows that the latent constructs have good reliability for each latent constructs the value chain practices, competence value chain, value chain attention, increased activity and performance of the agro-industry value chain has a value of ≥ 0.5 is required in the model. Results of the analysis showed that the five latent constructs VE has a value of between 0.4-0.5 is required either. The validity of discrimination between 0.6-0.8 required either, so that all meet the requirements of both variables in the model.

b. Hypothesis testing

The results of hypothesis testing shows that the H2 and H4-H7 is acceptable because the test results significantly with $CR > 2.00$ ($p < 0.05$). While the H1 and H3 was rejected because the value $CR < 2.00$ ($p < 0.05$). Hypothesis testing is shown in Table 7.

Testing H2-H4 accepted CR value respectively 3,383 and 3,925. There is a reciprocal relationship between the value chain practices, attention and competence value chain value chain as well as the positive contribution of each component of the value chain to increase the activity and performance of the agro-industry. The third construct is exogenous policy variables that were involved in the implementation of the principles of agro-industry value chain aloe vera. It is absolutely necessary that the alignment of the principles of the value chain for the development of aloe vera agro-industries in a sustainable manner.

Table 7. Hypothesis Testing of Structural Model of Value Chain Aloe Vera Agroindustry

			Estimate	S.E.	C.R.	P	Hypothesis	Description
ENHANCEMENT	<---	AVAILABILITY	-,110	,073	-1,509	,131	H1	rejected
ENHANCEMENT	<---	KRN	,832	,246	3,383	***	H2	accepted
ENHANCEMENT	<---	PRACTICE	,073	,144	,508	,612	H3	rejected
KA	<---	ENHANCEMENT	,837	,213	3,925	***	H4	accepted
KRN	<-->	AVAILABILITY	,223	,053	4,211	***	H5	accepted
KRN	<-->	PRACTICE	,206	,052	3,941	***	H6	accepted
AVAILABILITY	<-->	PRACTICE	,171	,050	3,426	***	H7	accepted

Source: primary data analysis, 2015

Testing H1 and H3 rejected by each CR value of -1.509 and 0.508 indicates that attention and practice the value chain does not affect the increase. Various activities described not everything can be done by value chain actors so they needed a good cooperation between the actors of the value chain so that the activities of the value chain can be improved and evolve towards the better. Each value chain actors still work separately separated and not well coordinated centrally. And this becomes important when all parties are responsible jointly to promote agro-industry *aloe vera*.

Food chain is the basic issues for the chain of agro industry. It means that the raw product grown on the farm is the problem with most of food which is transformed through a chain for food product process got by the customers on the outlet. A good quality product is considered very important since the globalization has increased the competition among the producer of the commodities in order to fulfil the demand of the customers for clean food (USDA 2002) . The food security has become the target of the debate that was held on the late 1990s and early 2000s so that providing high quality product for people (Foster *et al.* 2001).

Testing H2 and H4 H5 received CR values of 3.383 and 3.925 and 4.211 > 2.00 and $p < 0.05$ showed that increased activity affect the competence of the chain of value, performance of agro-industry influence on the increase in activity and value chain competencies to affect the increased activity. Manufacturers of processed *aloe vera* can overcome obstacles in his small company that cost barriers, the lack of knowledge, business management barriers, barriers quality of human resources. So that the performance of the manufacturer satisfies traders and consumers due to respond to customer needs, cooperation with key suppliers are good and have the ability to design products. This is in line with the second issue and the longest for the agro-industry is that they are dealing with commodities low margins where the power of competitive markets has typically resulted in production costs are very close to the value created, thus leaving profit margins are relatively thin (Boehlje 1999) , Moreover, Weather and climate influence the development of the raw product creation through agronomic production because the production is really depended on weather. If the weather is good, commonly there is no problem in producing the commodities (Miranda & Vedenov 2001). For example, value chain analysis of the tomato and bean production. It result in various quality of the raw product when it is produced (O'Keefe 1998). Price can be a stimulator for a business to grow. If the producers are able to to produce a good link especially in the supply and value, it can help to force the agribusiness industry. The link of the supply and value of the product will determine the flow of the product until customers. If the product is well distributed, it will come to customers and the supply will fluently flow, moreover, if the value of the commodities is high, the customer also will consider to buy so that the purchasing will be done smoothly due to the quality of the product.

Testing H6 received CR value of 3.941 > 2.00 and $p > 0.05$ indicates that the practice of value chain effect on the increase in activity. This means that manufacturers of processed *aloe vera* have a good management in terms of delivery remains a product, contact the end user after the product is purchased and developed the technology to be in line with the wishes of the value chain producers, traders and consumers that the price of the corresponding input, the output stream on time and output prices appropriate. Tracking product, or traceability, is the ability to track the inputs used to make food products back to their source through different points

in the supply chain. Track set for the attribute when attribute information about the specific systematically recorded from creation to marketing. For example, for complete traceability of beef will include the ability to identify genetic (through tracking DNA), a source of feed, husbandry techniques, methods of slaughter, etc. (Clemens 2003). Some attributes of a product can be recorded this way.

H7 testing received CR value of $3.426 > 2.00$ and $p < 0.05$ indicates that the improvement on the performance of the agro-industry. This means that manufacturers and merchants were able to run with good management value chain, namely the price of the corresponding input, output flow of timely and appropriate output prices. The effect of consumers being very satisfied with the performance, so that these effects lead to increased competitiveness and improved profitability for manufacturers and traders. This business operates as a single-purpose company, network, vertically integrated operations and wholesale company / merchandising. Only two or three of these businesses has an annual turnover of more than one million dollars (Ryder & Latham 2005). Furthermore, manufacturers and traders have a value chain management which is nice because it is assisted by the main factors, namely the farmers of aloe vera is the producer of the raw material processed aloe vera it is in line with research Bush harvest is the way of production dominant with half a dozen species of wild-collected (Robins & Ryder 2004). However, cultivation expanding as demand for bush food generally throughout the food production, processing and retail sectors, as well as in the restaurant trade. There is a growing tension between the production of food with the main agricultural and horticultural methods and the traditional approach to planting.

CONCLUSION

The development of industrial production has turned on to demand driven development. If a product is in a high demand, the potential market should be evaluated because without a good money supply, the purchasing will not happened a what expected. If the money is not managed well, the potency that is owned by product will not valuable because the market is not running duet o the money shortage.

There are five areas of concern in this writing, they are Marketing, production, finance, infrastructure and management. Marketing deal how the products are sold and distributed to the customers. Production is the ability to maintain supply and improve the quality of the commodities. Finance will determine the sales of the commodities. Infrastructure is the ability of the commodities arrive to the customer because of good facilities and other supporting instrument. And management is the knowledge of how to develop and create a opportunities for both parties to get a good system for production and consumption.

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