

DETERMINANTS OF TEA VALUE CHAIN LINKAGES IN THAI NGUYEN PROVINCE, VIETNAM

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Abstract

This study aims to explore factors influencing value chain linkages between actors in tea sector of Thai Nguyen province, Vietnam. Cronbach's alpha, exploratory factor analysis (EFA) and linear regression were employed. Data were collected from depth interviews with 170 actors in the tea value chain. This study finds out that five key factors influencing the value chain linkages including benefits; information; access to resources; risks and policies in the value chain. Among key factors, this study concludes that the operation policy is the most important factor influencing the linkages. Results imply that value chain interventions through support policies strengthen linkages and contribute to positive tea farm outcomes.

Keywords: Linkages, actors, value chains, tea operations, Vietnam

INTRODUCTION

Tee trees are seen as one of the most potential crops of Vietnam's agriculture sector as it is suitable with climate conditions and creates employment, improves income for farmers in Vietnam. In addition, the rising demand for tea in both domestic and foreign markets creates an advantages for the development of the tea sector in the country, particularly in the Northern Mountainous Region of Vietnam. Vietnam is one of the biggest five tea exporter with an average volume of 7000 tons and an export revenue of USD 10.700 millions. Among tea production areas in Vietnam, Thai Nguyen is an well-known tea production region, which has 18.600 hectares of tea, annually produces 185.000 tons of tea fresh buds. Although the tea sector has advantages and opportunities for development, its has encountered many difficulties such as limited tea quality; poor processing techniques, poor tea labels and standards, limited access to tea market and weak linkages between the actors in the value chain. Althouth, the government has implemented a comprehensive solution such tea production planning, selection of suitable tea varieties, cultivation techniques, quality assurance in order to overcome these inadequacies, tea sector in Thai Nguyen has been limited by poor linkages between actors, shortage of corporations and well as limited access to market and factors of production. As a result, tea products lack of necessary quality to fulfill market demand and therefore value added for actors in the value chain can not be improved.

LITERATURE REVIEW

There were many different studies and approaches to value chain analysis on the world and, according to Kaplinsky and Morris (2001), there have no approach is "the best". Basically, the specific analysis method depends on the research question and the characteristics of the research product. Because of the current value chain can be very complex, especially with many intermediates. An agricultural household (or an enterprise) can participate in different value chains.

In the study of Nguyen Van Huan (2010) which pointed out that Vietnam has a number of commodities involved in the global value chain such as rice, coffee, rubber, pepper, Basa Frish). The agricultural product processing industry have made significant contributions to the promotion of export value chains of agricultural products in Vietnam. However, the relationship between production and processing based on the value chain principle were still inadequate to meet the requirements of developing high quality agriculture. This article gave some views on the linkage chain between the agricultural production and the agricultural product processing industry in Vietnam. Meanwhile, Chu Tien Quang (2010) showed that: the process of economic development of human beings has now reached the association and crossed the boundaries of

national borders to form multinational companies. Participation in one area and to many other parts of the world is an economic globalization trend. In this process, the value chains of previously established products in a country have stepped out of that national boundary, penetrating into other countries, creating the value chain of Longer products, higher value or, in other words, larger scale, more engaging actors.

Tran Tien Khai (2011) argued that one of the current trends related to globalization is the emergence and development of modern markets. These commodity markets are closely linked to large-scale wholesale and retail supermarkets. These markets required a big number of goods and low cost products and must meet quality, hygiene and food safety standards. Merchandising systems of these markets are often vertically integrated, globally operating, and highly complex. These markets are very dynamic, responding rapidly to price fluctuations, consumer demand, and new technological opportunities. The size of revenue of these modern market systems is enormous, and combined with low cost, results in huge profits overall. The concentration of markets is huge, can control most sales even with only a few retail groups.

THEORETICAL FRAMEWORK

The term value chain refers both to a set of interdependent economic activities and to a group of vertically linked economic agents, depending on the scope of the study the focus of the analysis can be on the activities or on the agents. *A value chain starts with the production of a primary commodity, ends with the consumption of the final product and it includes all the economic activities undertaken between these phases such as: processing, delivery, wholesaling, retailing* (Lorenzo Giovanni Bellù, 2013).

Figure 1: General stages and relevant agents in a value chain



Actors	Input suppliers	Farmers, Cooperatives	Collectors, traders	Cơ sở chế biến, nhà máy, xí nghiệp...	Supermarkets, wholesalers, restaurants, retailers...	Domestic consumption, exports...
Activities	Varieties, Fertilizers, Pesticides, Labor	Soil preparation, cultivation, harvest	Collection, transportation, storage	Classification, processing, packaging	Wholesaling, retailing	Consumption

According to Fabre: *A value chain includes all the actors that participate in bringing a product or service from its conception to its end use in the market, as well as the extent and type of relationships between these actors. In other words, value chain development involves strengthening these product-to-market systems. The objective is to increase productivity and trade, and, ultimately, economic returns for small producers and agricultural businesses.*

All the actors including producers, processors, distributors, and retailers) that participate in bringing a product or service from its conception to its end use in the market, as well as the extent and type of relationships between these actors. Value chain development refers to strengthening product-to-market systems to increase productivity and trade, and, ultimately, economic returns for small producers and businesses. Actors in agricultural value chain include:

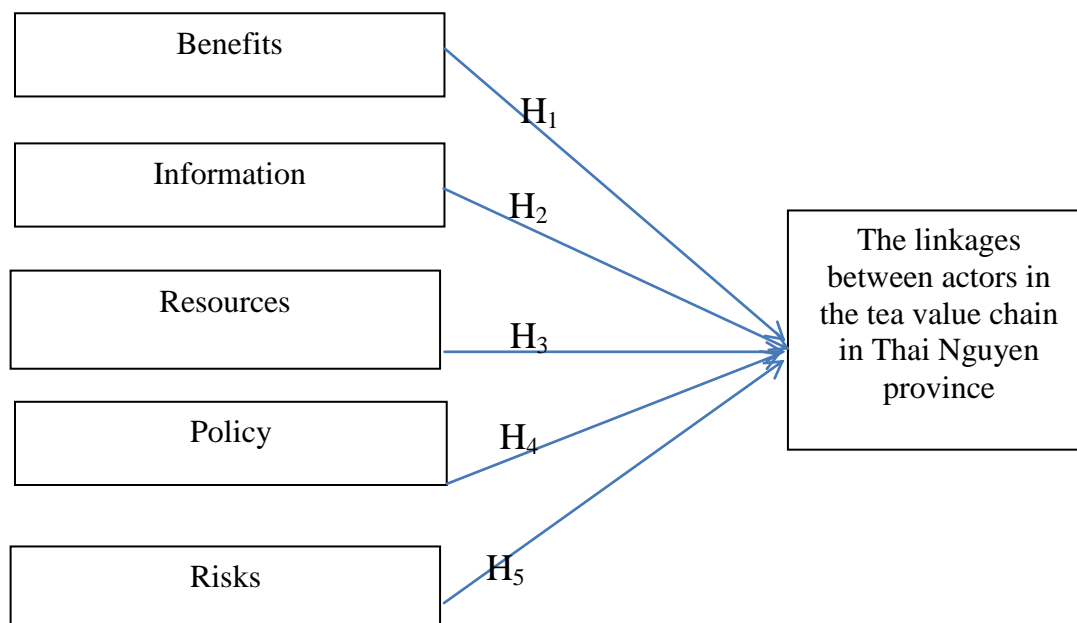
- Actor “farmers” include all individual farmers participating in the value chain.
- Actor “collector” consists of all individual collectors engaging in the value chain.
- Actor “Seller” refers to all wholesalers and retailers to trade and bring agricultural products to the end consumers.
- Actor “supporting” include all other actors such as banks, extensions, state agencies and so on to support the development of a value chain.

METHODOLOGY

Theoretical model

The theoretical model presents the factors and relevant hypotheses on how they influence the linkages between actors in the tea value chain in Thai Nguyen province:

Figure 2: Theoretical model



Hypothesis 1 (H1)-Benefit: It is assumed that a higher flow of benefits to each actor will strengthen the linkages between actors in the tea value chain.

Hypothesis 2 (H2)- Information: the transfer of information regarding learning, technical, financial and business services from one actor to another will improve the vertical linkages between actors in the value chain.

Hypothesis (H3)- Resources: Access of actors to resources can help reduce the cost of inputs and services (including financial services) and increase efficiency. It is therefore assumed favorable access to resources facilitate linkages between actors through collective learning and risk sharing while increasing the potential for upgrading and innovation.

Hypothesis 4(H4)- Policy: Governmental policy in terms of trade, infrastructure, financing, marketing will provide supports to actors in the value chain and facilitate different types of horizontal linkages, including cooperatives, associations between actors in the chain.

Hypothesis 5(H5)- Risk: A higher level of risks in the value chain can prevent a actor from cooperating with another. In addition, we address the important role that risk sharing plays in developing the sustainable tea value chain in Thai Nguyen province.

Empirical model

Five factors influencing the linkages in the tea value chain used the empirical model include: (1) Benefits to actors (X_1); (2) Information flow in the value chain (X_2); (3) Access to resources by actors (X_3); (4) Policy (X_4); (5) Risk incidence (X_5).

In this section, we employ a linear regression model using data collected from depth interviews with key actors in the tea value chain. Data were cleaned and coded using SPSS 20.0 software.

- Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group (a factor). It is considered to be a measure of scale reliability. In general, a score (Corrected item-total correlation) of more than 0.7 is considered acceptable. If the value is less than/below 0.3 then it indicates inconsistency or unreliable measure (e.g., questionnaire) thus, it is considered unacceptable.

- Exploratory factor analysis (EFA) is used to uncover the underlying structure of a relatively large set of variables. EFA is a technique within factor analysis whose overarching goal is to identify the underlying relationships between measured variables. In general, each item has a relatively strong loading on one factor (target loading > 0.5). Total variance explained should be at least 50% of the variance using the least number of factors. According to Kaiser's criterion, Eigen-values should be greater than 1. All acceptable variables will be later used in the linear regression as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5$$

Where:

Y: dependent variable

X_1, X_2, X_3, X_4, X_5 independent variables

- t-statistics and analysis of variance (ANOVA) will be used to test the statistical difference of some groups of item (factor) in relation to the linkages between actors in the tea value chain.

ANALYSIS AND RESULTS

Interviews with key informants and particularly with actors participating in the tea value chain, including farmers, collectors, traders, processing at all levels, and relevant governmental agencies were carried out at survey locations. In total, more than 170 actors were interviewed. The questionnaire was designed with a total of 24 variables to measure factors influencing the linkages between actors in the tea value chain. Applying a formula $n = 5 * m + 50$, a sample size will be 170. We collected a total of 170 questionnaires with full responses.

Table 1: Results of Exploratory factor analysis (EFA)

		Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Benefits	The value chain benefits actors	5.566	.401	.637
Alpha = 0.675	Reduce intermediate costs	5.193	.454	.613
	Each actor holds an important position in the chain	5.055	.474	.604
	Actors keep cooperative linkages	5.230	.458	.612
	All actors cooperate to develop the value chain for a common goal	5.408	.361	.656

Information Alpha=0.787	Transparent flow of information in the chain	7.891	.643	.723
	Accurate flow of information	7.232	.582	.744
	Timely and adequate information	7.704	.550	.753
	No constraints to receive information	9.070	.437	.784
	Information is used efficiently	7.934	.631	.726
Resources Alpha=0.656	Actors have no constraints to access to finance and credit	3.535	.431	.593
	Actors are willing to apply science and technologies to generate value added	3.286	.462	.571
	Sufficient labor forces in each stage of the chain	3.143	.494	.547
	Sufficient infrastructure (storage, processing, product show shops...)	3.589	.363	.638
Policy Alpha=0.683	Receive policies to support the development of the tea value chain	4.912	.457	.624
	Export policies	5.195	.426	.637
	Land use policies	5.204	.428	.636
	Market policies	5.316	.356	.667
	Financial policy to support actors	4.666	.519	.594
Risk incidence Alpha=0.672	Weather factor	5.312	.397	.633
	Market	4.915	.460	.604
	Management	4.887	.469	.600
	Logistics	5.101	.443	.612
	Support policies	5.210	.358	.651

Table 1 reports the results of Exploratory factor analysis (EFA). The first component is retained because it has an eigenvalue greater than one. Results show that all Cronbach's alpha coefficients greater than 0.6 and all Cronbach's Alpha of items greater than 0.3 revealing that all variables are accepted and have consistent and expected signs.

Using 24 variables, the results from Principal Component and Varimax show 22 variables load quite strongly to each factor with the absolute value of loadings is greater than 0.5. The remaining 2 variables have factors loadings smaller than 0.5 will be excluded. The remaining 22 variables are then analyzed using EFA and five general components are extracted from the analysis with total variances in the dataset 89,65%. The Kaiser-Meyer-Olin (KMO) test is an index for comparing the magnitudes of observed correlation coefficients to the magnitudes of partial correlation coefficients. KMO equals 0.764 (>0.5), indicating the adequacy of the

sampling. The analysis reflects that all variables used are appropriate to measure one common component. The significance level of the Bartlett test equals 0.0000 (<0.05) indicating that the EFA model is suitable to explain the factors influencing the linkages between actors in the tea value chain.

Five general factors are then incorporated into a linear regression to further explain the determinants of the linkages between actors in the tea value chain in Thai Nguyen province.

Table 2: General linear regression model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.801 ^a	.761	.735	.557

a. Predictors: (Constant), X₁, X₂, X₃, X₄, X₅

b. Dependent Variable: Y

ANOVA ^b						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	94,728	5	18.946	96.273	.000 ^a
	Residual	50.866	164	.310		
	Total	60.594	169			

a. Predictors: (Constant), X₁, X₂, X₃, X₄, X₅

b. Dependent Variable: Y

Results show that R^2 equals 0.761 indicating that all independent variables explain a total of 76.1% variances in the dependent variable. F-statistics equals 96.273 with the significant level of 0.00000 much smaller than 1% indicating that the model is fit to be used given survey data.

Table 3: Results of the linear regression model

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.081	.579		7.043	.000
	X ₁	.220	.076	.220	5.262	.000
	X ₂	.147	.079	.147	3.855	.000
	X ₃	.200	.090	.200	4.220	.000
	X ₄	.226	.088	.226	6.300	.003
	X ₅	-.178	.090	-.178	-2.309	.000

a. Dependent Variable: Y

Based on results in Table 3, the model can be written as follows:

$$(Y)=4.081+ 0.220*X_1+0.147*X_2+0.200*X_3+0.226*X_4-0.178*X_5$$

The model helps to explain five factors influencing the linkages: benefits, information, resources, policy and risks. All independent variables measured by Likert scales are able to indicate the level at which each factor influences the linkages. In addition, results also show that the policy factor has the strongest impact on the linkages, followed by benefits, resources and information. As expected the coefficient of the risk variable is negative show revere relationship between risk incidence and the strength of linkages between actors in the chain. All coefficients are positive and statistically significant at 1% level.

CONCLUSION

The study found out that five factors influencing the linkages between actors in the tea value chain: (1) Benefits to actors through participating in the value chain; (2) The flow of information; (3) Access to resources by actors in the chain; (4) Policy; and (5) risk incidence exposed by actors. The study used 24 observable variables and all five hypotheses are accepted at a significant level of 5%. The model fits to conclude that all factors are strongly associated with the linkages between actors in the value chain. Based on results, recommendations to further improve the chain and generate value added are as follows:

Strengthen the linkage between four stakeholders including the state, the scientist, the farmer and the enterprise for years, support models demonstrated their efficiency and feasibility in tea value chain development;

The inefficient implementation of policies in the sector is needed to create real incentives to the innovation and resources mobilization in this tea sector. Accordingly, contract farming, relaxing access constraints to resources, market demand forecasting, training, application of hi-technology in tea production, quality assurance for tea towards VietGAP, Global Gap standards are very relevant.

It is very necessary to make sure that the flow of information in the value chain is timely, accurate and updated to benefit all actors in the chain. Moreover, the linkage between stakeholders in the tea value chain can be strengthened through harmonious benefit-cost sharing between actors.

The government should enhance its role in managing inputs such as fertilizer, pesticide, tea varieties, quality insurance. It is also important to promoting anti-counterfeiting, infringing intellectual property to improve tea quality.

Talking about scope for further research, in subsequent studies, researchers should conduct a broader study in different provinces in Vietnam for a more multidimensional perspective on research issues.

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