Enhancing the Coffee among Small holder farmers by Value-Added System in Thandaunggyi Township, Karen State, Myanmar

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Abstract

Thandaunggyi is one of the townships in Karen state, Myanmar that is categorized as a conflict-affected (brown) area, characterized by late development and natural sightseeing place. However, since crop agriculture are susceptible to drought, Robusta coffee has become the sole most important alternative form of sustenance. Despite documented potential benefits of value addition, coffee is majorly produced and marketed with little processing. There is insufficient knowledge on why this is the case. Using survey data from 185 randomly selected coffee farmers from three areas in Thandaunggyi township, descriptive methods were used to summarize household characteristics and to characterize the farming systems in the study areas, while in-depth interviews with 40 participants and the Probit Regression Models were used to determine the extent of value addition contingent on the decision of a coffee famer to participate in value addition activity, and to assess the link between coffee value addition and household poverty status, respectively.

Introduction

Like most of other countries in ASEAN, Myanmar economy is predominantly agricultural. Sixty-seven percent of the population is rural, and agriculture accounts for 32% of gross domestic product (GDP), 56% of employment, and 24.4% of exports [1]. Consequently, agriculture, through its roles in supplying affordable food to improve the real purchasing power of consumers, generating farm incomes, and providing employment, can play an essential role in economic progress and poverty reduction. Moreover, given that a majority of the country's ethnic minority groups are agriculturally dependent, developing the sector will also contribute to inclusive and regionally balanced growth and social stability. Myanmar has comparative advantages due to its unique geographical location adjacent to big markets such as China, India and Thailand.

Historically, much of the effort has been focused on increasing agricultural productivity. However, productivity is looked at in terms of physical output rather than the monetary value. In looking at monetary value, focus will shift from extractive activities to post harvest (marketing) activities like transport, storage, and transformation to consumable products. Due to this shift in focus, agribusiness and value addition have gained more importance as a way of fighting rural poverty.

Myanmar has grown coffee since the British introduced Arabica plants to Shan State. Today coffee plants are grown in numerous locations throughout the country, from Kachin State in the north to Mon State in the south, but on a relatively small scale and largely at the lower end of the business. Much of the country's coffee output consists of lower-grade. Robusta beans for instant coffee and export. Better quality Arabica beans grown in Shan State and other locations are mainly sold to traders at the Myanmar-China border and elsewhere for low prices.

In order to try and start a new era, the Myanmar Coffee Association (MCA) was

established in 2014 with the aim to increase income for coffee farmers and to upgrade their living quality by means of annual increase in productivity and innovation. Its members want to increase home-grown processing of beans to create higher-grade finished products, including specialty coffees. They also hope that more coffee associations will spring up throughout the country, including in locations such as Kayin (Karen), Kachin and Kayah states, to help boost the industry, raise livelihoods and encourage competition.

According to data from the Department of Agriculture (DoA), most of the coffee plantations in Thandaunggyi grow the Robusta variety. The total planted area is estimated to be 6,800 acres with an annual production of about 300,000 viss (approximately 500 tons).

In the Thandaunggyi area, coffee is produced by small-scale farmers who grow coffee on their land next to other crops, such as durian, cardamom, lychee, and other cash crops. The volumes produced are relatively small. In terms of production techniques, most farmers use the multiple stem system which results in approximately 435 trees per acre. On average, farmers own about 500 trees on 1-2 acres of land, with an average production yield of 60-600 viss. This results in an average profit of about 1 million Kyat ($ 680) per year for each coffee farming household. For small-scale farmers, this is a significant contribution to their household income.

There are four main reasons to do this research in Thandaunggyi township. Firstly, this research assists the entrepreneurs in coffee industry to understand the scope of socio-economic factors which is mainly affected to smallholders in coffee farming agribusiness. It could be advantage to plan the strategy not only value addition processes but also overcoming the constraints in start-up agribusinesses.

Secondly, the market is emerging, as described above, in case of doing many observations led by international researchers who are supported by agricultural development organizations. In facts, coffee is already a kind of export product of Myanmar to China, Thailand and so on. But still needs to improve the quality and pricing strategy to enter the global market. On the other hand, the factors influencing to primary supplier (farmers) is one trigger to be considered by such as agribusiness owners, official associations and exporters in Myanmar.

Third, the awareness to comprehend the value addition and its benefits is as critical as the potential demand. As a smallholder farmer, the risk of making profit has precisely related with the factors of socio-economic. With the awareness of value addition, the vertical integration could be driven by them.

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Lastly, the financing in agribusinesses is one of the prevalent issues as same as others industry. Conversely, most of the agribusinesses are formed with people from rural areas. They have limited skill to manage the time and wealth. Thus, the financial institutions, i.e. microfinance, have to deal with unexpected condition. This paper would comfort them to reduce those unexpected risks.

Literature Review

Value Addition

Value addition can be broadly stated as the process of economically adding values to products (raw commodities) that possess intrinsic value in their original state by changing their current place, time, and form characteristics to improve their economic value and preferred by consumers in the market place [2]. According to this author, value addition can be achieved in two ways; innovation and coordination. Value addition through innovation focuses on improving the existing processes, procedures, products, and services or creating new ones, while value addition through coordination involves arranging partnership among the value chain actors that produce and market farm products, changing the distribution of value in the chain which in turn through direct marketing, vertical integration, producer alliances, and cooperative efforts. By producer alliances is to mean individuals/companies from the same level of the chain consolidate in order to produce and market a superior product whereas by cooperative effort is to mean individuals or companies pool their products in order to increase bargaining power.

Madevu [3] studied the nature and magnitude of competition between supermarkets, green grocers and hawkers in the fresh produce markets of South Africa and ways of improving the value chain. He used the value chain analysis method and found that the value chain can be improved in four ways: processes, product, functional and chain upgrading. He also found that low income areas were dominated by informal traders while the supermarkets dominated the high-income areas. He recommended empirical testing of the effect of value addition on profitability, sales and competitiveness.

Punjabi [4] observed that it has become clear worldwide that the most rapid growth in agriculture has been occurring on the part of post-production activities. This is being driven by growth of middle-income consumers even in low income countries and their demands for better-quality value-added products. Absence of agro-industry and agribusiness resulting in low levels of value addition of agricultural commodities has been one of the main causes of stagnation in rural incomes.

A substantial agribusiness sector generating a high outflow of value-added commodities is always correlated with high agricultural GDP and high rural incomes.

Brewin et al [5] examined the adoption of product and process innovations in the Canadian food processing industry using multivariate probit model. Their findings suggest that firms that conduct both process and product innovations in- house are better able to enjoy complementarities that arise in the discovery process. They also found that firms were more likely to innovate in response to keeping pace with competitors.

Gashaw et al [6] expressed that value addition after production would involve enhancements or additions to a product that result in higher returns to the commodity seller, who is often the farmer. From preliminary survey conducted prior in the study area, it is observed that selling value added coffee after drying would result in more earnings/profit than that of red cherry form. Yet, unlike their interest for value addition, farmers are challenged with many problems largely because of marketing environment, supportive services, resources, processing technologies, infrastructure, and economic and socio-demographic factors.

There were farmers who did not add value on coffee while others add value. Besides, there was variation between the intensity of value addition between those farmers who were involved in adding value on coffee. Farm level coffee value additions vary across socioeconomic and demographic characteristics of farm households and also in relation to factors associated with market access and institutional support services. Thus, to put value addition as an alternative and formulating strategies in line with it, it was pertinent to first analyze the underlying determinants of intensity of coffee value addition by smallholder farmers.

Tamru & Minten [7] show that lack of access to wet mills (in close proximity), lack of enough red berry buyers, and bad quality coffee reduce the likelihood of red berries sales. On the other hand, government's action of deciding designated selling dates, membership to a cooperative, and getting advances increase the likelihood of selling coffee in red berries form.

It is also interesting to find out that time-preference and risk-taking behavior of coffee farmers influencing the decision and volume of red berry sales. Results display that given positive level of red berry sales, time impatient coffee farmers do sell larger quantity of coffee in red berries form as compared to time-neutral farmers. On the other hand, risk taking coffee farmers is found to be more probable to sell their coffees in red berries form as compared to the risk neutral and risk adverse coffee farmers. Risk loving coffee farmers do also sell considerably larger quantity of red berry coffee as compared to risk-neutral coffee farmers.

They found out that membership to coffee-cooperatives increases the likelihood of selling in red. Furthermore, coffee farmers that have access to a loan are more likely to sell their coffee in red as compared to farmers that do not.

Customer Acceptance

Lucke [8] provides an important assumption for the term acceptance: it is based on the relations between acceptance subject, acceptance object and acceptance contest. The acceptance subject is a person or a group that provides acceptance for the acceptance object. For the term customer acceptance, the subject is the customer or a customer group that is not necessarily an individual human being: departments, organizations or societies are also potential customers.

In this context, Picot and Reichwald [9] differ between operators, users, organizations and societies. The acceptance object describes in this work a product, a service or a product-service system. The acceptance context contains the backgrounds of and between subject and object. In this work, the context covers the conditions and requirements between customer and product, e.g. purchase situation or time. As acceptance depends on all three parts (subject, object and context), they influence the degree of acceptance: if one of them changes, the degree of acceptance changes as well. Customer acceptance is not a one-dimensional property that exists or not, it consists of several aspects and it can be quantified and measured.

Socio-economic factors

Minai [10] show that 87.65% of the household heads were male while 12.35 % were female indicating that most households are male headed. The average age of the farmers was 52.95 years with the youngest farmer being 20 years old and the oldest 91. This suggests that the small holder coffee farming cluster is skewed towards the ageing. This concurs with the findings of the Coffee Research Foundation baseline survey conducted under quality coffee and commercialization project. Since most coffee production operations in the farm are manual, this has the potential to limit productivity. The results also agree with the findings of Adesoji and Farinde [11] who found that farmers older than 52 years had a tendency of getting less yields.

The findings revealed that 6.05% of the household heads had no formal education, 51.21% had primary education, 34.68% had secondary education and 8.06% had tertiary education. The mean number of years of education was 8.16 years. Generally, the more educated people are, the more efficient producers they become [12]. Low literacy levels can therefore hamper coffee production.

The study of Minai [10] showed that 48.21% of the farmers in the study area had farm sizes of 1 acre or less, 43.83% had farm sizes of between 1.1 and 5 acres and only and only 7.97% had 5.1 acres or more. This showed

that the farmers in the area have small farm holdings. The average area under coffee was 0.63 acres while the minimum and maximum acreage was 0.04 and 8.93 acres, respectively. The percentage of farmers who consulted extension staff or attended training in the last three years was 72.11 %. Of these, 94.74% attended field training while only 5.26% went to an office to seek advice. This means that field-based trainings would reach out more farmers than waiting for farmers to seek information themselves.

Besides, the study of Minai [10] shows that 76.52% of the farmers need credit to farm their coffee. Of these, 81.04% had access to credit while 18.95% indicated that they had no access. This inadequacy of credit is primarily because most societies lend depending on the number of kilograms delivered at the factory. Majority of the co-operative societies limit the credit to Ksh 10 per kilograms of cherry delivered. This creates a vicious circle of low yields since only those who have cash from other sources can afford the fertilizers and pesticides needed for coffee production. Those credits enable farmers to adopt new technologies more readily since they are able to plan ahead. Most of the credit, 86.6% was sourced from the co-operative societies with only 4.24% being sourced from the banks. None of the farmers indicated to have borrowed from the Coffee development fund despite the fund being in existence for over seven years.

Research Model and Hypotheses

In this study, the assortment of two assumptions could results the expected output. Firstly, the decision to add value in coffee is influenced by common socio- economic factors of target population in Thandaunggyi township. Socio-economic factors are background factors that result from stimuli exerted on the business by other activities, responsibilities as well as inbuilt human characters of the entrepreneur.

Whether the decision to add value or not follows the value-added product which is currently comprehensible product in the local market around the target area. The expected output is tolerable by finding the correlation between the customer acceptance of product and the value-added product of smallholder farmers. Finally, the value-added system expedites the result if one adds value it is expected that his level of income will improve (Figure 1).

Following hypotheses were used to examine,

H01: Decision to add value is not related with socio-economic factors. H02: Customer acceptance of product is not related with value addition. HA1: Decision to add value is related with socio-economic factors.

HA2: Customer acceptance of product is related with value addition.

Methodology

Sampling

The enough information has got from the responsible person of coffee development department under the management of Agriculture Ministry at Kyauk Tine. The total population is around 2,000 at targeted areas. According to Yamane formulation, the sample population is 185 in total of three villages.

Yamane's formula,

$n = \check{}\ (\$\%''\&\ )$

Where,

n= corrected sample size,

N = population size, and

e = Margin of error (MoE), e = 0.1 based on the research condition.

The sample size for in-depth interview was taken according to the number of participants who agreed to share.

The corresponded number is 40 participants in targeted area.

For Customer Acceptance survey, the total population of businesses and customers were not shown in specific. The researcher used the random sampling method and the sample size was 206 respondents. Both surveys were performed snow-ball data collection method.

Measurement

This research study consists of 2 parts as follow.

Part 1: Structured questionnaires

In this part, the farmers will answer the structured questionnaires which could satisfy the hypothesis of the study. The main focus of the questionnaires is the data interrelated with socio-economic conditions of the respondents have relationship with value addition on the product or not. There will be two tools to collect the data through online and on paper survey.

Part 2: Structured questionnaire

In this part, the customer acceptance of product is fulfilled by collecting data through closed-ended questionnaire from random consumers (B2C) and the retailers/wholesalers (B2B).

They are those in which some control or guidance is given for the answer. This may be described as closed form because the questions are basically
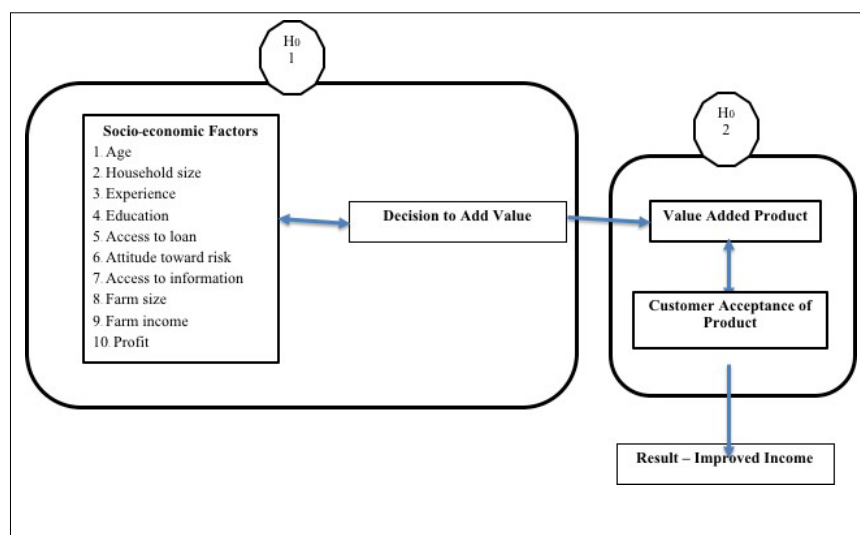

Figure 1. Research conceptual model.

short, requiring the respondent to provide a 'yes' or 'no' response, or checking an item out of a list of given responses. Questions that require yes or no answers are also termed as Dichotomous questions. It may, also be multiple choice options from which the respondent selects the answer closer to their own opinion. The respondent's choices are limited to the set of options provided. This is a data collection instrument mostly used in normative surveys.

This is a systematically prepared form or document with a set of questions deliberately designed to elicit responses from respondents or research informants for the purpose of collecting data or information. It is a form of inquiry document, which contains a systematically compiled and well-organized series of questions intended to elicit the information which will provide insight into the nature of the problem under study.

Data Analysis and Results

The study will use descriptive statistics like mean, frequencies and percentages to address objectives one, two and three. In doing this, the study evaluates whether the entrepreneurs engaged in value addition activities, the motivating factors for engaging in value addition, and finally the value addition systems were characterized and described. Information was collected from the farmers on the form, in which they dispensed their products (coffee beans) and all the other related services that accompanied the sale for example drying the beans, transporting, packaging, branding, brewing and others were also considered as they are all just different ways of adding value to raw beans. The quantities of coffee that goes to each form of value addition after sale service were also noted, because enterprises can be doing more than one form of value addition simultaneously. The intended goal for value addition was given by the farmer and his perception on whether it was achieved or not.

To determine the factors influencing the decision to engage in value addition, objective four, a Probity model will be used. The decision to use Probity is based on the fact that the decision to add value is discrete and dichotomous (one either adds value or not), discrete decisions are analyzed using qualitative response models one of which is Probity.

Part 1: Socio-economic Factor Composition of the Respondent

The researcher sought to investigate influence of social factors on smallholder coffee production. The social factors studied included age, household size, farming experience, education, access to information, attitude toward risk, farm size, farm income and profit of small-scale coffee farmers. The results are shown in Table 1.

Table 2 shows that, there was inequality in smallholder coffee farming of both gender and age. Most farmers, (38.4%) were aged between 39 and 54 years and (37.3%) were aged between 55 and 73 years. It was also the male dominated enterprise with majority, (53.5%) men against (22.2%) women. Young people of less than 22 years were fewer, (2%) and especially men. Meanwhile, there are more women in eldest group.

Table 3 shows that majority, (87%) of the respondents were married, (11.9%) were single while (1.1%) were separated.

Table 4 shows that majority, (45.9%) of smallholder coffee farmers had High school education, a total of (30.3%) had Middle school education. There were (22%) in both Primary and Higher education.

Table 5 shows that majority, (40%) of smallholder coffee farmers had farming experience for 26 years and above, a total of (24.3%) had 15 to 25

Table 1. Social Composition of the Respondent by Gender.

Gender	N	Percentage
Male	134	72.4
Female	51	27.6
Total	185	100

Table 2. Social Composition of the Respondent by Age and Gender.

Age Group	N	Male Percentage	Female Percentage	Total Percentage
Under 22	5	2.7	0	2.7
23 - 38	33	15.1	2.7	17.8
39 - 54	71	25.4	13	38.4
55 - 73	69	28.1	9.2	37.3
74 - Above	7	1.1	2.7	3.8
Total	185	72.4	27.6	100

Table 3. Marital Status of Respondents.

Marital Status	N	Percentage
Single	22	11.9
Married	161	87.0
Separated	2	1.1
Total	185	100

Table 4. Composition of Respondents by Level of Education.

Education Level	N	Percentage
Primary	22	11.9
Middle	56	30.3
High	85	45.9
Higher	22	11.9
Total	185	100

Table 5. Composition of Respondents by farming experience.

Years of Farming	N	Percentage
1 - 3	25	13.5
4 - 8	25	13.5
9 - 14	16	8.6
15 - 25	45	24.3
26 - Above	74	40
Total	185	100

Table 6. Composition of Respondents by farm size.

Farm size (acre)	N	Percentage
1 - 5	166	89.7
6 - 10	12	6.5
11 - 20	7	3.8
Total	185	100

years experience. There were (13.5%) each for 1 to 3 years and 4 to 8 years experience while (8.6%) had 9 to 14 years experience.

Table 6 shows that majority, (89.7%) of the respondents were farming 1 to 5 acres, (6.5%) were farming 6 to 10 acres while (3.8%) were farming 11 to 20 acres.

Table 7 shows that majority, (76%) of smallholder coffee farmers have medium family size with 4-8 members. The below 4 members and 9 - over members have same percentage (11.9%) respectively.

Table 8 shows that majority, (39.5%) of smallholder coffee farmers have not received any information about agribusiness while the receiving from social group/community and peers was slightly the same (28.6% and 26.5%). The information from multimedia was lowest (5.4).

Table 9 shows that, there was inequality in smallholder coffee farming of both income per year and saving/deficit. Most farmers, (70.8%) did not save from coffee farming although (76.8%) of smallholder farmers had lowest income; lower than 3 lakhs (MMK) and (21.1%) farmers had saved not more than 1 M (MMK) from coffee farming.

Table 7. Composition of Respondents by household member.

Family member	N	Percentage
Below 4	22	11.9
4 - 8	141	76.2
9 - over	22	11.9
Total	185	100

Table 8. Composition of Respondents by Channel of Information received.

Channel	N	Percentage
None	73	39.5
Social/Community	53	28.6
Peer	49	26.5
Multimedia	10	5.4
Total	185	100

Table 9. Composition of Respondents by Income and Saving/Deficit.

		< 3 lakhs	3.1 – 1M	1.1 -2M	> 2.1M	
< 1M	39	17.9	2.2	1.0	0.0	21.1
1.1M-1.5M	11	2.7	0.0	3.2	0.0	5.9
15.1M-25M	2	0.0	0.0	0.0	1.1	1.1
> 25.1M	2	0.0	0.0	0.0	1.1	1.1
None	131	56.2	8.1	1.1	5.4	70.8
Total	185	76.8	10.3	4.3	7.6	100

Table 10. Composition of Respondents by Attitude Toward Risk.

Attitude Toward Risk	N	Percentage
Slightly	23	12.4
Moderately	21	11.4
Seriously	18	9.7
Unknown	123	66.5
Total	185	100

Table 11. The Risk Level of Production.

Production	N	Mean	Std. Deviation
plucking	185	1.2865	.73653
Drying	185	.4108	.71770
Hulling	185	.5622	.84550
Roasting	185	2.4108	1.02887
Grinding	185	2.3730	1.06134
Packaging	185	2.2270	1.23020
Advertising	185	2.6108	.94977
Display the product	185	2.6000	.92783
Delivery service	185	2.0757	1.30413

Table 10 shows that, the considerate on risk is still unknown with the highest percentage (66.5%). Generally, the attitude towards risk was based on the process of coffee production in Thandaunggyi, such as plucking, drying, hulling, roasting, grinding, packaging, advertising, display the product and delivery service. The following table describes the risk level of production.

As shown in above Table 11, the risk of Roasting, Grinding, Packaging, and Delivery service are serious phase of coffee production for the farmers (mean value = 2). Nevertheless, the Advertising and Display the product are still unknown phase for them (mean value = 3). Moreover, the risk of plucking is moderately described (mean value = 1) while drying and hulling is slightly risk (mean value = 0).

N.B Correlation is significant at 0.01 levels (2-tailed).

Out of nine factors evaluated; influence of age of the farmer, influence of the farm size of the farmers owned, influence of year of farming, influence of

household member, influence of education level of the smallholder farmers, the attitude toward risk, the influence of information channel, influence of income per year and influence of saving/deficit amount, there are only influence of education level and income per year of the small scale farmers which showed strong relationship with the value added coffee production at 0.01 level of significance. This interprets that the level of education of the small-scale farmer was associated with 38.9% increase while the level of income per year was associated with 44.3% increase in value addition (Table 12).

The attitude toward risk has perfectly negative linear relationship with value addition level of coffee production. No correlation was established between social factors and farm size and farming experience though both at young and advanced age farmers had fewer acres of coffee farming and experience.

Table 13 shows that, the education, attitude toward risk and income of smallholder farmer have significantly probability to add value by coefficients (-1.11), (0.764) and (-0.672) respectively. The standard errors of probable factors were (0.3493), (0.1820) and (0.1909) apiece. The other parameters; age (-0.616), family size (-0.993), farming experience (-0.291), accessible channel of information (-0.202), farm size and saved/deficit (-0.132) from selling coffee have no significant probability to make the decision aimed at the value addition in coffee farming.

Part 2: Customer Acceptance on Thandaunggyi Coffee

Coffee is one of the beverages, which has various type and flavor. In Myanmar, coffee consumption per capita is increasing steadily every year and consumers' needs are diversifying. Similarly, the Myanmar market for coffee is also expanding, and the various types of ready-to-drink (RTD) and cold brew coffees are now available in coffee shops. Due to its complex flavor and characteristics, the customer acceptability is one of the parameters need to consider. However, few studies have considered brew coffee in terms of both instrumental and sensory aspects. Therefore, it is important to examine and identify consumers' acceptability of Thandaunggyi coffee and the sensory attributes that affect perception and interaction between them.

The Customer Acceptance on Thandaunggyi coffee was conducted by 206 participants who are users, retailers, and wholesalers. The data were collected in Thaung Goo and Thandaunggyi townships. The following Tables have shown that the customer acceptance on value added products.

The customer acceptance on Thandaunggyi coffee is rated according to value addition system of smallholder farmers. Generally, the perception on Thandaunggyi coffee is based on the characteristics of the product and the value-added product is categorized into four conditions of product: Red cherry, Roasted, Grinded and Brewed coffee.

As shown in above Table 14, 180 respondents have accepted the value-added type of grinded coffee in Majority. However, the roasted coffee is accepted by 25 respondents while one of 206 respondents accepts red cherry which mean value-added product.

The characteristic of value-added coffee was accepted by aroma, taste, color, and availability. Majority, 91 respondents accept the taste rather

Table 12. Correlation Coefficients among Socio-economic Factors Influencing Value added Coffee Production.

Influencer on Value Addition	Sig. (2-tailed)	Factor Score
Age	0.812	0.018
Farm size	0.513	0.048
Years of farming	0.163	-0.103
No. of household member	0.052	-0.143
Smallholder's education	0.000	0.389**
Attitude toward risk	0.000	-0.449**
Channel of info	0.076	0.131
Income per year	0.000	0.443**
Saving/Deficit	0.0668	0.032

Table 13. Description and measurement of variables to be used in the Probit model.

Parameter	B	Std. Error	Lower	Upper	Wald Square	Chi- t	Sig.
			95%			Wald Confidence	
					Hypothesis Test		
Age	-.616	.3012	-1.207	-.026	4.184	1	.041
Family size	-.993	.4877	-1.948	-.037	4.142	1	.042
Experience	.291	.1678	-.037	.620	3.016	1	.082
Edu	-1.11	.3493	-1.797	-.428	10.146	1	.001
Risk	.764	.1820	.408	1.121	17.644	1	.000
Info:	-.202	.2016	-.597	.193	1.005	1	.316
Farm size	.773	.5496	-.304	1.851	1.980	1	.159
Income	-.672	.1909	-1.046	-.297	12.377	1	.000
Save	-.132	.1241	-.375	.112	1.124	1	.289

Table 14. Customer acceptance on Value-added product.

			product			Total
			Red Cherry	Roasted	Grinded	
Character	Aroma	Count Expected Count Residual	0	2	59	61
			.3	7.4	53.3	61.0
			-.3	-5.4	5.7	
	Taste	Count Expected Count Residual	0	7	84	91
			.4	11.0	79.5	91.0
			-.4	-4.0	4.5	
	Color	Count Expected Count Residual	0	1	0	1
			.0	.1	.9	1.0
			.0	.9	-.9	
	Availability	Count Expected Count Residual	1	15	37	53
			.3	6.4	46.3	53.0
			.7	8.6	-9.3	
		Count	1	25	180	206
Total		Expected Count	1.0	25.0	180.0	206.0

Table 15. The significant correlation test by using Chi-Square.

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	29.693[a]	6	.000
Likelihood Ratio	25.314	6	.000
Linear-by-Linear Association	22.208	1	.000
N of Valid Cases	206		

than other characters. The aroma of coffee is accepted by 61 respondents and the availability of coffee is accepted 53 respondents while one of 206 respondents accepts the color of coffee.

Since in the Table 15 p-value is less than our chosen significance level $\alpha = 0.05$, it can reject the null hypothesis, and conclude that there is an association between Customer acceptance and Value-added coffee.

As described in conceptual framework, the growth of farm income is related with value addition system. The value addition process is constructed on red cherry, drying, hulling, roasting, grinding, packaging and other.

Mostly, the smallholders perform hulling as value addition but it is not adequate to be analyzed. Therefore, the roasting and above were set as value added system and below stages including hulling were not considered by using data transformation in SPSS.

As shown in Table 16, the respondents who did not add value on coffee rather than hulling have low income and the others 26 respondents who add value on product had more income. Since the p-value is less than our chosen significance level $\alpha = 0.05$, it can reject the null hypothesis, and conclude that there is an association between Farm income and Value-Added activities.

Based on the results, it can be stated the following:

• There was a significant association between customer acceptance and value-added product ($X^2(1) = 29.7$, p < .001).

• There was significant association between farm income and value-added activities ($X^2(1) = 26$, p < .001).

• The socio-economic factors are related with the decision on value addition.

• The in-depth interview study summarizes the contributing factors that influence the decision to make value addition among smallholder coffee farmers: (i) Current Value Addition, (ii) Individual Standardization, (iii) Sustainable Price for Smallholder (iv) Essential Tools (v) Advanced Production Process (vi) Credit Access (vii) Certification (viii) Education Level (ix) Attitude Toward Risk (x) Farm Income.

Discussion and implications

This study explored and described the factors involved in the development of Thandaunggyi coffee as the valued-added product through mixed research. The present section will look critically at the findings from interviews done,

Table 17. The significant correlation test by Chi-square.

	Value	df	Asymptotic Significance (2-**sided**)
Pearson Chi-Square	25.997[a]	3	.000
Likelihood Ratio	20.374	3	.000
Linear-by-Linear Association	25.730	1	.000
N of Valid Cases	185		
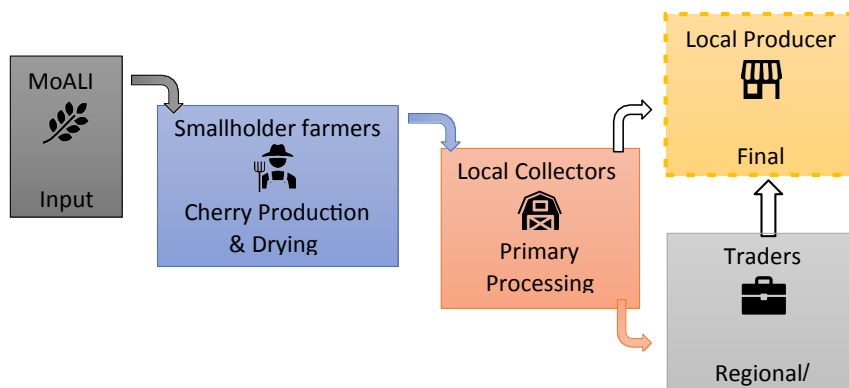
Figure 2. Current Value Chain.

questionnaires administered and written materials analyzed.

There are different players in the coffee sector who have a key impact on the production of coffee. They should work together to ensure that the production of coffee increases, to increase the local and international client base, and to increase benefits to the stakeholders and the economy as a whole. These stakeholders are the farmers who grow coffee, business people who own coffee grinding stations, Government officials who work in the coffee sector, in policy implementation and monitoring, and traders who export coffee.

However, despite previous opportunities, the Thandaunggyi coffee sector faces serious challenges that would need to be resolved for better outcomes to be ensured. As Gashaw [6] expressed, farm level coffee value additions vary across socioeconomic and demographic characteristics of farm households and also in relation to factors associated with market access and institutional support services. The findings have shown that the farmers in targeted area have same condition to be cracked in order to proper value chain (Figure 2).

Madevu [3] found that the value chain can be improved in four ways: processes, product, functional and chain upgrading. In the figure above, the local producer who performed the final processing is the critical part of chain upgrading. The products are noticeably exported after primary processing. It was the loss segment of coffee value chain.

There is a lack of a developed value chain linking growers to consumers. Strengthening this chain is essential for ensuring that farmers benefit from being integrated into wider markets an issue which will grow in importance as Myanmar tries to increase its exports of coffee. While there appears to be high competition among processors, there is minimal appreciation for the retail value of growing quality coffee. One view is that high competition among processors is beneficial for farmers because it may raise the prices offered to farmers. However, greater competition also erodes the ability to make profits, which could end up weakening the desire for processors to form close relationships with growers.

Punjabi [4] observed that it has become clear worldwide that the most rapid growth in agriculture has been occurring on the part of post-production activities. This is being driven by growth of middle-income consumers even in low income countries and their demands for better-quality value-added products. Absence of agro-industry and agribusiness resulting in low levels of value addition of agricultural commodities has been one of the main causes of stagnation in rural incomes. A substantial agribusiness sector generating a high outflow of value-added commodities is always correlated with high agricultural GDP and high rural incomes.

Madevu [3] also found that low income areas were dominated by informal traders while the supermarkets dominated the high-income areas. It is same fact that there are informal traders who collect the coffee (red cherry and dried bean) from farmers. Those informal traders have no license and no contract on most of trading procedures.

In addition, small-scale investors continue to face numerous challenges leading to land tenure insecurity, thereby undermining their investment. Registering land use rights is a very long and uncertain process. Once acquired, land use rights are strictly regulated and any change in the use of the land needs to be registered and related fees paid. Furthermore, customary land rights are weakly recognized in the existing legislation. Indeed, the new land laws discourage shifting cultivation and smallholders practicing such cultivation cannot register their land use rights. The land management system remains quite inefficient and confusing due to the existence of different laws regulating different types of agricultural land and different land management agencies lacking co-ordination.

Literacy status is another significant variable that affect intensity of value addition positively. Building education capacity of rural farmers through arranging consecutive trainings and experience sharing sessions among smallholder farmers or arranging other formal way of education should be designed to increase farm level coffee value addition.

Conclusion

Current Value addition status

• The value addition is generally accepted as the smallholder coffee farming is executed by traditional value addition system.

• The hulling process is performed mostly as value addition activity.

• The respondents were very knee to standardized the valued added production process.

Motivation to add value on product

• Sustainable price for the crops is essential for smallholder. The loss of price difference before the cultivation and after is quite high which have potential to stop planting coffee.

- In modern world, the essential tools/machines for production should be available at real farming area. The production would be faster, saved labor cost and the prospective of mass production is the dream of farmers.

- The customer acceptance on valued added product would be developed through not only local market but also export market.

Alternative value addition system

- The participants expect to emerge the standardized production for local products. It was still misplaced issue to be solved as soon as possible.

- Innovated technology in Agri-businesses is the unique solution to empower the value addition system.

- Credit accessibility was not ease for everyone. The procedures of getting loan should be mindful as clear as it can.

- Certification is first priority or may not significantly. Instead, the farmers have to decide to initialize the short- term plan or long-term plan.

- Somehow, low education level and untrusty on government system is the roots of communication breakdown between the authorities and local people.

Socio-economic Factors

- The local residents in the area had no proper education level. And the main income generating has come from farming.

- Most of the respondents have basic education level who is mostly farmers with traditional farming experience.

- Vocational and awareness trainings are the way to educate about farming and life skills.

- In coffee production, the complications are arising in each step. Most of the participants mentioned that the traditional solutions are still being engaged.

- Farming industry has a lot of chance to take advantages as other industries. The preparation and experience are the fundamental necessities to take the risk.

- Most of the farmers are low income and they have no financial statement.

- As mentioned, the rodent infestation made serious damage to the coffee farms for nearly three years. Most of the farmers do not expect income from coffee. Subsequently, the substitute crops were low demanded for 2 years. It is obvious case while doing research.

- Commonly, the quality of Thandaunggyi coffee was scored at 92 internationally. That would suit one of the inspirations to enhancing the coffee production.

- The need is a policy, something like to protect right of local farmers.

- Regard, the farmers should have preparation like joining awareness trainings to improve the knowledge.

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