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Sustainability of Rubber Farmers Cooperatives: Empirical Evaluation of Determining Factors

Kajohnjak Nuanphromsakul[1], Katarzyna Szczepańska-Woszczyna[2], Sebastian Kot[3], Singha Chaveesuk[1], Wornchanok Chaiyasoonthorn[1]

[1] KMITL Business School, King Mongkut's Institute of Technology Ladkrabang, Bangkok, Thailand

[2] Department of Management, Faculty of Applied Sciences, WSB University, Dabrowa Gornicza, Poland

[3] Faculty of Economics and Management Sciences, North-West University, Vanderbijlpark, South Africa and Faculty of Management, Czestochowa University of Technology, Poland

Abstract

The study investigated the factors that influence rubber farmers' cooperatives from the perspective of sustainability in Thailand. The research adopted a quantitative survey methodology with data purposively collected from 434 Thai rubber farmer groups. The variables included trust, sustainability, perceived value, satisfaction, loyalty, and brand image. The model was evaluated using Confirmatory Factor Analysis (CFA), while Structural Equation Modeling (SEM) was used to assess the hypotheses. The results indicated that the sustainability of the rubber farmers' cooperatives as a corporate entity is influenced by brand image, loyalty, and satisfaction. Trust was also found to have a significant effect on the satisfaction and loyalty of the rubber farmers' cooperatives. The research recommended that to enhance the sustainability of the rubber farmers' cooperative's brand image, loyalty, and satisfaction should be improved. The research's drawback is that it only looked at the rubber farmer cooperatives of Thailand as a corporation, and therefore, these factors should be taken into account when applying these results outside of this scope.

Keywords

Sustainability, rubber farmers, structural equation modeling, cooperatives, Thailand.

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Introduction

Thailand's rubber farmer cooperatives are considered vital as they play a crucial role in determining the sustainability guidelines of rubber plantation occupation, especially for small groups of rubber plantation farmers in terms of production, processing, and marketing. The rubber farmer's cooperatives have two groups. The first group is rubber farmer cooperatives, which are corporations such as associations and co-operatives, which are groups of farmers. The second group is rubber farmer cooperatives that are not corporations, such as groups of rubber plantation farmers and business groups. According to Section 4 of the Rubber Authority of Thailand Act, B.E. 2560 (2017), rubber farmer cooperatives must register with the Rubber Authority of Thailand to obtain support and assistance in organizing activities related to Para rubber. Recently, 789 groups of farmers have registered as rubber farmer institutions (Rubber Authority of Thailand, 2017). Nevertheless, the past activities organized by the rubber farmer cooperatives in relation to sustainability have still not convinced small rubber farmers to become members and participate in the activities due to many internal and external factors. The external factors are economic situations, societies, politics, cultures, and regions. There are two types of internal factors. The first type is behavioral and ideological, where members feel having different traits is a constraint in joining cooperative groups. They also set the various ultimate goals in the establishment of farmer institutions that affect the motivation to become a member of farmer cooperatives and the development of their participation in determining the development guidelines for farmer institutions that create stability and sustainability. The second type deals

with the structure of the farmer cooperatives, such as rational criteria, establishment objectives, implementation process, budget, duration, target, and implementation guidelines.

In the past, the rubber farmer cooperatives called for a closer collaboration with the government for support. It suggested a lack of fortitude and resilience as if the farmer's institutions were unable to serve as a hub for resolving issues for small farmers. Besides, the world rubber price situation has been volatile and uncertain, and the prices of natural rubber depend on the price in the futures market with the speculation of market investors. In the situation of global rubber production in 2015, there were 28 rubber-producing countries with 77.60 million rai in total, and the total production was 12.0 million tons (Office of Agricultural Economics, 2015). Thailand is the second country with the most rubber plantation areas (the rubber plantation area in Thailand is 22,176,714 million rai, followed by Indonesia (Rubber Authority of Thailand, 2017). Moreover, Thailand is the world's largest producer and exporter of natural rubber and its natural rubber production is estimated at 4.5 million tons per year, with an annual export of 3,749,456 tons (BizVibe, 2022). Under those circumstances, the rubber farmer institutions that are the owners of products do not have opportunities to participate in setting the trading prices of rubber.

Although the cooperatives play an important role in promoting and assisting farmers, other factors cause the farmer institutions to lose their memberships and are not sustainable. The main factors are the motivation of small farmers to become members of the rubber farmer cooperatives, the rubber prices that the farmer institutions purchase from their members, dividend income paid by the farmer cooperatives, average refunds, and welfare. Other key factors are the convenience of traveling to sell products, the honesty of the farmers' institution committees, and the past participation that could not achieve the given policy or goal. All these factors make the farmer unaware of the importance of farmer institutions and lack confidence in farmer cooperatives; also, the farmers assumed that the group could not help or solve their problems. Some groups of farmers do not register as corporations due to several difficulties. For instance, they not only have to prepare income and expense accounts but also have to encourage the members to register as juristic persons. The framers cannot fully conform to legal acts with the status of non-cooperation. The management lacks transparency because some members can manipulate the advantages. For instance, they can take benefits from the rubber prices that the farmer institutions purchase from members; the dividend income paid by the farmer institutions; the average refunds; the welfare; the convenience of traveling to sell products; and the integrity of the farmer institution committee and members, etc. Also, regarding the auction market of rubber products, there is a competition to launch the market, causing the separation of group members, and the government agencies promoting both policy and budget lack continuity, causing farmers to not see the benefits of farmer institutions. These reasons are the main factors of motivation that directly affect small farmers, leading to their applying for membership in rubber farmer cooperatives.

The uncontrollable external factors are other issues for the stability and sustainability of rubber farmer cooperatives, including economic conditions, societies, politics, cultures, crude oil prices, exchange rates between Thai Baht and other currencies, stock market movements, gold prices, climate conditions, natural disasters and speculation in the rubber futures market. When the rubber farmer cooperatives are stable and sustainable under a successful model of establishment, it will result in a gathering of members, products, dividends, working capital, brainstorming, and the concept of activity. Based on this background, this research investigated the determining factors of the rubber farmer cooperative's sustainability from the corporate perspective. The study objective focused on the sustainability of rubber farmers' cooperative and the impact on individual farmers who are members of the cooperative. This underscores the relevance of such groups and how they harness relationship and provide support effectively to group members. To this end, the specific objectives of the study include:

1. To ascertain the influence of the rubber farmers brand on farmers decisions.
2. To find out how perceived value affects loyalty and satisfaction to the rubber farmers' cooperative.
3. To explore the connection between trust and satisfaction with the rubber farmers' cooperative by rubber farmers.
4. To determine the influence of loyalty on sustainability.

Materials and methods

Since 1991, para rubber has been an important economic crop in Thailand. Today, Thailand is the world's No. 1 producer and exporter of para rubber, which makes hundreds of millions of baht per year for Thailand. In 2012, about 2.7 million tons of rubber was exported from Thailand, generating approximately 4 billion Baht. But in recent years, the price of rubber in the export market has been valued at about 183.64 Baht per kilogram in 2011, creating a highly volatile market and a gradual price decrease, resulting in losses for rubber farmers throughout the country (Rubber Authority of Thailand, 2017). Moreover, the continuously decreasing price of rubber raises concerns among rubber farmers throughout the country since the framers are not able to sustain the production costs with the low price of rubber.

Thailand has been recognized for its outstanding achievements in rubber production and export for over two decades. In 2014, Thailand, the world's biggest producer of para rubber, made 4.20 million tons of rubber production, with exports accounting for up to 34.37 percent, followed by Indonesia and Malaysia made rubber production of 3.17 and 0.84 million tons, equivalent to 25.94 percent and 6.87 percent of the global rubber production, respectively. Meanwhile, Thailand exported para rubber for 3.80 million tons, accounting for 37.15 percent or more than 1/3 of total para rubber export around the world. The major trading partners are China, Japan, and the United States, followed by Indonesia and Malaysia. The export was 2.90 and 1.36 million tons of para rubbers, accounting for 28.35 percent and 13.29 percent of the global rubber export volume, respectively (ERIA, 2016).

Over the past five years, natural rubber prices in Thailand have been plummeting since 2014, and the lowest price took place in 2015 because of the recession in European and American economies. Furthermore, China, the world's biggest rubber consumer, has faced a financial crisis, and the world market price of oil has been falling. Even though in 2016-2017 the rubber price has increased, it fell again in 2018 since the investors were reluctant to take a risk during the economic and political crisis, especially for international trade policy between China and America. Thus, rubber prices have fluctuated all the time.

The Sustainability Concept: Sustainable development is a key term in developing and emergent nations; moreover, some scholars and researchers have recognized and interpreted this term differently. Petushkova (2022) pointed out that the concept of sustainable development is a concept that compromises between a development-oriented group and an environmental-oriented group, in the rich zone and the poor zone. They are all satisfied with this concept because it is a concept that fosters both development and the environment. Sustainable development consists of various elements, which include:

1) The economy, which is a development to equally satisfy the needs of humans in the present era and the next eras without affecting future needs. It can produce a product that is friendly to the resources and needs of consumers.

2) The society, who's status is considered as sustainable for social development. It aims to provide humans with higher knowledge, performance, and productivity; and to promote a quality society, including a learning society, by organizing social systems as well as various businesses to be combined, harmonized, and united based on knowledge and reality.

3) Nature and the environment, which is the development of a sustainable environment that is based on the limits of natural resources and the environment, can meet current needs without adversely affecting future needs, and maintain the environment and nature as much as possible.

4) 4) The humans, applied to sustainable development: It is important to serve human development, both physical and mental aspects, such as good health, diligence, patience, responsibility, skill, knowledge, and expertise.

5) Technology, which is a technological development with the use of supportive technology. The framework of sustainable performance describes the application of sustainable development concepts to supply chain management to improve efficiency that affects the competitiveness of companies and organizations.

The frameworks of actions on the economy, society, and environment, which are mutual relationships, allow scholars to identify the most efficient approach from a sustainable development perspective, resulting in stable development. Moreover, this leads to a stable economy and encourages self-reliance, and economic

immunity, as they are prepared for changes. Sustainable development is growth that does not destroy the environment; instead, it is sustainable and beneficial to the society for the long term.

Brand Image

In this research, the element of brand image proposed by Wijaya (2013) has been adopted as one of the frameworks since it is relevant to the sustainable model of the rubber farmer cooperative registered as a juristic person. The term "brand identity" refers to the name, logo, color, slogan, tagline, vision, and personality of the executive or typeface of the cooperative or group of rubber farmers. Previous research suggests that brand image is not only associated with perceived value but also customer loyalty. For instance, Jung et al. (2020) conducted a study on sustainable marketing activities in the traditional fashion market and brand loyalty. The finding revealed that sustainable marketing activities resulted in brand image, trust, and satisfaction positively. The activities also created brands of royalty.

Brand perceived value

Anderson et al. (1993) and Majerova (2020) noted that consumers' perceived value is a result of whether they are satisfied with the product or service. It is divided into two types: the perceived value of price and the perceived value of quality. Petrick (2002) reasoned that the instrument that had been used to measure the perceived value could merely indicate tangible results. Thus, he develops an instrument that covers other dimensions. Zeithaml (1998) developed the model of how perceived value could be measured. This method is called the SERV-PERVAL scale. The results of many studies revealed that SERV-PERVAL is reliable and accurate. The model consists of five related dimensions: quality, emotional response, monetary price, and behavioral price.

Concepts of Satisfaction

Satisfaction with service quality can be measured by the perception and evaluation of service quality from the feedback that the providers gain from various situations and timings and the expectation that the consumer has of the service. Hence, the components of consumer satisfaction and service quality are composed of two key elements. Chaipunya (1998) pointed out that attitudes are measured in the following ways: (1) Questionnaire: The questionnaire aims to gather information from respondents. The respondents are required to answer a series of question that is relevant to several dimension of satisfaction. (2) Interviewing: Structured interviews should be used for collecting reliable data and (3) Observation: This method can be performed by observing the language use, manner, and reaction of the target group. The procedure for the observation should be structural.

Brand Loyalty

Aaker (2014) noted that brand loyalty is the positive view and satisfaction of the consumer with a product. This perception leads to the tendency of consumers to frequently purchase the products. Having a strong and positive relationship with the consumer can benefit a business over its competitors. That the competitors offer the same quality of products or services is not important since the consumers still have confidence in the particular brand, and it continuously meets the consumers' needs. For this reason, brand loyalty is formed (Kositsurangkakul, 2003; Chaveesuk et al., 2020). Brand loyalty is probably a result of a positive attitude toward the brand and whether the consumers have confidence in the brand. It also comes from when the brand can meet the consumers' needs or when the consumers continue purchasing the same brand. However, the marketing strategy plays a crucial role in brand royalty since brand royalty should be built, otherwise, the consumer will purchase other brands.

Trust

Trust reflects the effectiveness, identity, and culture of the organization and it leads to the sustainability of the organization (Yuen et al., 2018). Fazal and Kanwal (2017) studied the factors that lead to brand royalty. The result revealed that the brand trust of customers plays an important role in creating brand loyalty. The most satisfied customers are the loyal ones. In Pakistan, customers preferred price comparisons among brands, which influence their loyalty to one brand over another. Trust in a brand is a result when the consumer can rely on the brand. Trust is one of the factors that lead to brand loyalty. For instance, Park and Kim (2015) analyzed the different sustainable fashion brands and fast fashion brands with a sample of 556 respondents. The results suggested that consumers form brand loyalty toward sustainable versus fast fashion in a different manner. Hence, the operators should put more emphasis on improving trust to increase loyalty among customers.

Conceptual framework and hypothesis development

From the discussion of the literature review above, the following conceptual framework and research hypothesis were developed

Hypothesis 1 (Hl): Brand Image has a positive effect on influencing perceived value.

Hypothesis 2 (H2): Brand Image has a positive effect on loyalty.

Hypothesis 3 (H3): Brand Image has a positive effect on sustainability.

Hypothesis 4 (H4): Perceived value has a positive effect on loyalty to the organization.

Hypothesis 5 (H5): Perceived value has a positive effect on satisfaction.

Hypothesis 6 (H6): Trust has a positive effect on satisfaction.

Hypothesis 7 (H7): Satisfaction has a positive effect on loyalty to the organization

Hypothesis 8 (H8): Trust has a positive effect on loyalty.

Hypothesis 9 (H9): Loyalty has a positive effect on sustainability.

Hypothesis 10 (H10): Loyalty significantly mediates the effect of independent variables on sustainability.

Constructs

The study adopted a descriptive quantitative survey design, aimed to define the determining factors of the rubber farmers' cooperative's sustainability. The population was 434 Thai rubber farmer groups/cooperatives that are corporations. The respondents were purposively selected and classified into 3 groups, namely as follows: 1) the group of rubber farmers in the advanced stage or developed stage; 2) the group of rubber farmers in the developing stage, and 3) the group of rubber farmers in the initial stage. Questionnaires were used as an instrument for data collection. The data was analyzed using Structural Equation Modeling (SEM), which is a statistical model that describes the linear causal relationship between external latent variables through the intermediate variables into internal latent variables. The variables included brand image; perceived value; Satisfaction; Trust; Loyalty and Sustainability.

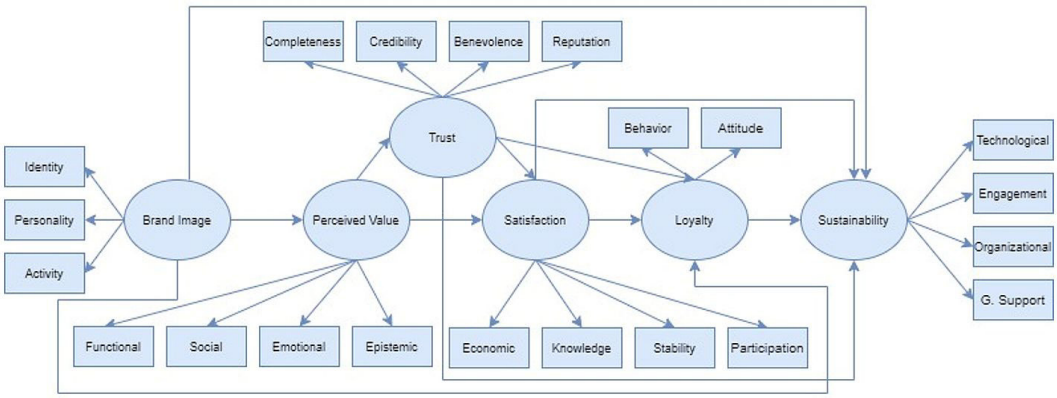
Data Collection and Analysis

The closed-ended questions were applied to ask respondents to choose from a distinct set of responses. The researcher sent a questionnaire to the sample group by sending a letter, online, or by mail, and handing out the questionnaire directly to the sample group. The questionnaire consists of questionnaires that have been reviewed by experts, along with a letter from King Mongkut's Cooperative of Technology Ladkrabang requesting cooperation. The first analysis was done on the basic statistics of samples by using descriptive statistics such as Frequency, Percentage, Mean, Standard deviation, Coefficient of Variation, Skewness, and Kurtosis. The Pearson's product-moment correlation coefficients are used to see the linear relationship among various variables. Confirmatory Factor Analysis to evaluate model fitness. Path Analysis using SEM was used for the survey of direct influence, indirect influence, and overall influence of factors affecting the sustainability of the rubber farmers' corporation.

Results and discussion

Demographic characteristics

The first evaluation done was for the demographic characteristics. A summary is presented in Table 1.



Source: Authors' elaboration

Figure 1: Conceptual framework.

		Frequency	Percentage
Gender	male	284	0.65
	female	152	0.35
			0.00
Age	20 -30	87	0.20
	31 -40	180	0.41
	41 - 50	102	0.24
	50+	65	0.15
			0.00
Rubber farming period	0-5 years	172	0.40
	6-10 years	209	0.48
	10+ years	53	0.12
			0.00
No. Rubber products	0-10kg	149	0.34
	10-50kg	189	0.44
	50+ kg	96	0.22
			0.00
Member of cooperative	yes	329	0.76
	no	105	0.24

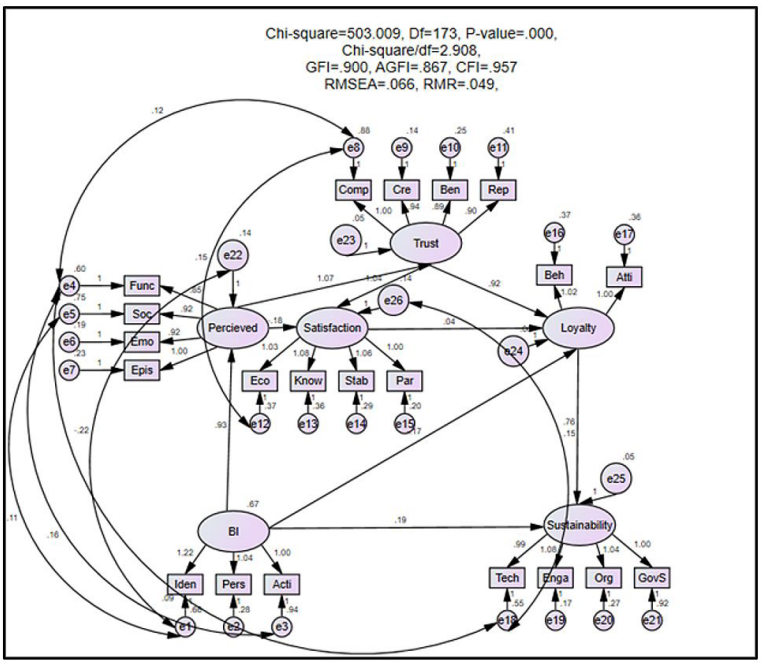
Source: Authors' elaboration

Table 1: Demographic features of respondents.

The results indicated that the majority of male respondents represented 65% of the sample, followed by female respondents, who comprised 35% of the sample respondents. Another characteristic that was evaluated was the age variable. The majority age group was between 30 and 40 years (41%) followed by those aged 40–50 years (24%), then there was the age group 20–30 years (20%) and lastly, the age group above 50 years (15%). Another variable that was evaluated was the rubber farming period in which the respondents had been engaged. The majority indicated 6-10 years (48%) followed by 0-5 years (40%) and lastly, 10+ years (12%). The number of rubber products was also considered where the majority was 10-50 kg, followed by 0-15 kg and lastly 50+ kg (22%). The respondents were also asked whether they were a member of the cooperative and 76% agreed while 24% did not.

Evaluation of the model

The proposed model for the study was analyzed for suitability. The confirmatory factor analysis (CFA) was conducted to determine the fitness of the model used in the analysis. The fitness aspects that were evaluated included model chi-square, goodness of fit (GFI), adjusted goodness of fit (AGFI), comparative fit index (CFI), root mean square error or approximation (RMSEA), root mean square residue. As presented in the following figure, GFI = 0.900, CFI = 0.957, satisfied the required threshold of >0.900. AGFI = 0.867 satisfied the required minimum threshold of >0.800. The Chi-square/df = 2.908 satisfied the required threshold for <5.00. The RMSEA = 0.066 which satisfied the required threshold of <0.08. These thresholds were suggested by Tucker and Lewis (1973), Byrne (1994), Schumacker and Lomax (2004) and Kline (2015). The satisfaction of these threshold confirmed that the data and study constructs fitted well to the model as shown in Figure 2.



Source: Authors' elaboration

Figure 2: Model evaluation.

The reliability and validity of the model was also evaluated, in addition to the model fitness. The reliability was evaluated using Cronbach's alpha and composite reliability. The required threshold should be >0.8 (Diamantopoulos et al., 2012; Trizano-Hermosilla and Alvarado, 2016). The results presented in Table 2 showed that these threshold were met clarifying the reliability of the variables. The validity of the model was evaluated using standardized factor loadings and average variance extracted. The threshold is considered to be >0.5 (Black and Babin, 2019). The threshold was also satisfied, clarifying the validity of the variables.

In addition to the above model evaluation, the discriminant validity test was conducted and presented in Table 3. The Fornell-Lacker criterion was applied where it measures the degree of differences between the overlapping construct. n the assigned construct have to be higher than all loading of other constructs with condition that the cut-off value of factor loading is higher than 0.70. This criterion was satisfied, confirming the construct validity of the research model.

The next analysis was the evaluation of the hypotheses of the study. The structural equation modelling was conducted to evaluate the relationship between the study variables. The results are presented and summarized in the Table 4 and Figure 3.

Variables		Items	Standardized factor loadings	Cronbach's alpha	Composite Reliability	AVE
BI	→	Acti	0.645			
BI	→	Pers	0.85	0.892	0.922	0.721
BI	→	Iden	0.777			
Loyalty	→	Beh	0.802	0.972	0.975	0.851
Loyalty	→	Atti	0.804			
Perceived	→	Epis	0.87			
Perceived	→	Emo	0.872	0.867	0.956	0.682
Perceived	→	Soc	0.668			
Perceived	→	Func	0.683			
Satisfaction	→	Par	0.893			
Satisfaction	→	Stab	0.869	0.952	0.957	0.859
Satisfaction	→	Know	0.85			
Satisfaction	→	Eco	0.836			
Sustainability	→	GovS	0.632			
Sustainability	→	Org	0.843	0.913	0.856	0.638
Sustainability	→	Enga	0.899			
Sustainability	→	Tech	0.718			
Trust	→	Comp	0.705			
Trust	→	Cre	0.919	0.852	0.897	0.762
Trust	→	Ben	0.857			
Trust	→	Rep	0.797			

Source: Authors' elaboration

Table 2: Reliability and validity estimation.

	1	2	3	4	5	6
BI	**0.897**					
Loyalty	0.782	**0.8323**				
Perceived	0.687	0.818	**0.973**			
Satisfaction	0.783	0.672	0.732	**0.893**		
Sustainability	0.872	0.723	0.792	0.732	**0.892**	
Trust	0.836	0.732	0.863	0.682	0.739	**0.983**

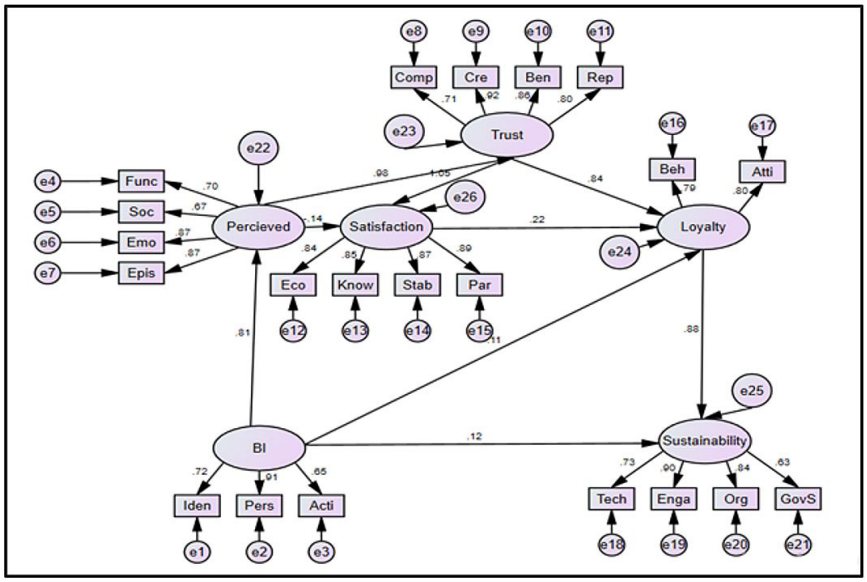
Source: Authors' elaboration

Table 3: Discriminant validity.

Path Relationships					β	S.E.	C.R.	P
Direct Effects								
BI	→			Perceived	0.826	0.064	12.98	***
BI	→			Loyalty	-0.104	0.061	-1.694	0.09
BI	→			Sustainability	0.111	0.052	2.16	0.031
Perceived	→			Satisfaction	-0.151	0.327	-0.461	0.644
Trust	→			Satisfaction	0.988	0.296	3.338	***
Satisfaction	→			Loyalty	0.194	0.077	2.515	0.112
Trust	→			Loyalty	0.705	0.096	7.352	***
Loyalty	→			Sustainability	0.846	0.077	11.03	***
Perceived	→			Trust	1.093	0.063	17.25	***
Indirect Effects								
BI	→	Loyalty	→	Sustainability	0.672	0.872	2.92	***
Satisfaction	→	loyalty	→	Sustainability	0.089	0.0563	8.872	***
Trust	→	Loyalty	→	Sustainability	0.278	0.0826	4.283	***
Perceived	→	Trust	→	loyalty	0.783	0.278	1.774	***

Source: Authors' elaboration

Table 4: Path relationships of the findings.



Source: Authors' elaboration

Figure 3: Empirical results.

The results of the SEM analysis indicate that BI has a positive and significant effect on perceived value (β = 0.826, p<0.01), confirming H1. BI was found to have negative and significant effect on loyalty (β = -0.104, p<0.05), rejecting H2. BI was found to have positive and significant effect on sustainability (β = 0.111, p<0.05), confirming H3. Perceived value was found to have negative an insignificant effect on satisfaction (β = -0.151, p>0.05), leading to rejection of H4. Trust was found to have a positive and significant effect on satisfaction (β = 0.988, p<0.01), confirming hypothesis 5. Satisfaction has a positive and insignificant effect on loyalty (β = 0.194, p>0.05), hence rejecting H6. Trust was found to have a positive and significant effect on loyalty (β = 0.705, p<0.01), confirming hypothesis 7. Loyalty has a positive and significant effect on sustainability (β = 0.846, p<0.01), confirming hypothesis 8. Perceived value has a positive and significant effect on trust (β = 1.093, p<0.01), confirming hypothesis 9. In addition, the mediating role of loyalty was evaluated. The results was found to indicate that loyalty was a significant

mediator of the effects of BI, satisfaction and trust on sustainability (β = 0.672, 0.089, 0.278 $p<0.01$) respectively.

The purpose of this empirical research was to investigate the factors that influence the rubber farmers' cooperative sustainability aspect. Interesting results have been obtained regarding the relationship between the variables considered, and the effect of these variables on the sustainability of the rubber farmer's cooperatives. To start with, this research found that the sustainability of the rubber farmers' cooperatives is influenced by three factors – loyalty, brand image, and satisfaction. Sustainability of rubber farmer's cooperative was found to be significantly and positively be influenced by loyalty and its associated aspects such as behavior and attitude. If brand loyalty was improved by 1 unit, then sustainability would be improved by 0.543 units and vice-versa. These results were supported by Ismail et al (2019) whose results indicated that five major drivers showed the co¬operative's sustainability including strong members' support, a better support system, effective management, an established business strategy and direction, and good knowledge required of the board members. Satisfaction was also found to positively and significantly influence sustainability of rubber farmer's cooperatives. The aspects of satisfaction that were found to influence sustainability include economics, knowledge, stability, and participation.

Brand image was found to significantly influence the sustainability of the rubber farmer's cooperatives. The aspects of brand image that were considered relevant in this analysis included brand identity, brand personality, and activity. These results are supported by Ana Tur-Porcar et al (2018) whose results indicated that one of the factors that related rubber farmer cooperatives registered as juristic persons in Thailand was human relations, and business activity. Ethical principles and values, together with competitive intelligence, are crucial for undertaking actions that lead to sustainability.

Another important result to consider is that, perceived value has significant effect on trust of rubber farmer's cooperatives. The aspects of perceived value worth considering in this case include the functional value, social value, emotional value, and epistemic value (Kot and Brzezinski, 2015; Ayu et al., 2020). These results were in line with that of Karajaluoto et al. (2012) whose findings concluded that trust and value are the key factor of long-term relationships. Furthermore, it was found that perceived value, which is positively associated with trust leads to the relationship. Business image was also found to have positive and significant effect on perceived value of the rubber farmer's cooperatives. This was according to the findings of Amir Jalilvand et al. (2016) that corporate reputation was associated with perceived value.

The study critically found that a positive and significant influence of trust on both satisfaction and loyalty. According to the findings of this study, a unit increase in trust would lead to a more than a unit increase in both satisfaction and loyalty of the rubber farmers' cooperatives. It therefore indicated that trust is a critical factor as far as better performances of rubber farmers' cooperatives are concerned. In line with these findings, Koupai et al. (2015) result indicated that the trust had an effect on customer loyalty since it created customer satisfaction and form purchasing habit of the customer. Moreover, satisfaction variable was associated with trust and had a positive and significant influence on establishment of loyalty.

From the findings of this research, several recommendations are relevant. First, the rubber farmers cooperatives, over a long period of time have been in situations that needs urgent re-evaluation and improvement. The past activities organized by the rubber farmer cooperatives could not motivate and be a model of stability and sustainability to convince small rubber farmers to become the members and participate in the activities, due to many factors. There has also been lack of strength and ability to survive as if the farmer institutions were not able to be a center to solve problems for small farmers. To address this issue, it is relevant to improve the sustainability of the rubber farmer cooperatives. There are three factors that should be improved, in order to improve the rubber farmer cooperatives sustainability. These are brand image, loyalty, and satisfaction. For the brand image, the specific factors to improve include brand identity, brand personality, and activity; for the loyalty, the specific factors to improve include behavior and attitude; while the specific factors to improve for satisfaction include economics, knowledge, stability, and participation. This research also recommends that to improve the rubber farmer cooperatives loyalty and satisfaction, trust factor should be addressed and improved to significant levels.

Conclusions

Several conclusions could be highlighted from the research regarding the sustainability of rubber farmer cooperatives as corporations. The first conclusion is that three factors are significant when considering targeting and improving the sustainability of rubber farmer cooperatives as a corporation. These factors include brand image, loyalty, and satisfaction. Each of these variables has a specific aspect that should be considered necessary. For brand image, these factors include brand identity, brand personality, and activity; for loyalty, these factors include behavior and attitude; while the factors for satisfaction include economics, knowledge, stability, and participation. It is also concluded that trust is a critical factor as far as the satisfaction and loyalty of rubber farmer cooperatives are concerned. Trust has an effect on customer loyalty since it creates customer satisfaction and form purchasing habit of the customer. The limitation of this research is that it focused on Thailand's rubber farmer cooperatives specifically as corporations; therefore, the application of these results outside of this scope should be made with these considerations. Future studies can compare the applicability with rubber farmers in Thailand and other ASEAN countries to understand the dynamics of the data from Thailand. Another limitation was the use of only rubber farmers' who are members of rubber cooperatives. Future studies should consider rubber farmers who are not affiliated with any cooperatives. This is to ascertain their views on rubber cooperatives and why they are yet to join one, especially whether factors such as trust, attitude, brand image, and perception have any influence on their current and future decisions to join a cooperative.

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Corresponding authors
Wornchanok Chaiyasoonthorn
KMITL Business School, King Mongkut's Institute of Technology Ladkrabang
Bangkok 10520, Thailand
E-mail: wornchanok.ch@kmitl.ac.th

References

[1] Aaker, D. (2014) "*Aaker on branding: 20 principles that drive success*", New York, Morgan James Publishing, p. 136. ISBN 1614488703.

[2] Anderson, J. C., Jain, D. and Chintagunta, P. K. (1992) "Understanding customer value in business markets: Methods of customer value assessment", *Journal of Business-to-Business Marketing*, Vol. 1, No. 1, pp. 3-30. ISSN 1051-712X. DOI 10.1300/J033v01n01_02.

[3] Ayu, M., Lindrianasari, L., Gamayuni, R. R. and Urbański, M. (2020) "The impact of environmental and social costs disclosure on financial performance mediating by earning management", *Polish Journal of Management Studies*, Vol. 21, No. 2, pp. 74-86. ISSN 2081-7452. DOI 10.17512/pjms.2020.21.2.06.

[4] BizVibe (2022) "*Rubber industry in Thailand: World's largest natural rubber producer and exporter*". [Online]. Available: https://blog.bizvibe.com/blog/plastics-leather-and-rubber/rubber-industry-thailand-worlds-largest [Accessed: Feb. 15, 2022].

[5] Black W. and Babin B. J. (2019) "Multivariate data analysis: Its approach, evolution, and impact", In Babin B. J., Sarstedt M. (eds.) "*The great facilitator*", Springer, Cham, pp. 121-130. ISBN 978-3-030-06031-2.

[6] Byrne, B. M. (1994) "*Structural equation modeling with EQS and EQS/Windows*", Thousand Oaks, CA, Sage Publications, p. 85. ISBN 9780803950924.

[7] Chaipunya, P. (1998) "Satisfaction measurement", Bangkok, Sangaksom.

[8] Chaveesuk, S., Chaiyasoonthorn, W. and Khalid, B. (2020) "Understanding the model of user adoption and acceptance of technology by Thai farmers", *MSIE 2020: Proceedings of the 2020 2nd International Conference on Management Science and Industrial Engineering*, April 2020, pp. 279-285. DOI 10.1145/3396743.3396781.

[9] Diamantopoulos, A., Sarstedt, M., Fuchs, C., Wilczynski, P. and Kaiser, S. (2012) "Guidelines for choosing between multi-item and single-item scales for construct measurement: A predictive validity perspective", *Journal of the Academy of Marketing Science*, Vol. 40, No. 3, pp. 434-449. ISSN 0092-0703. DOI 10.1007/s11747-011-0300-3.

[10] ERIA (2016) "Agricultural policy for natural rubber farmers in Thailand", In Yamamoto, H. (ed.), "*Research for Consideration of a Policy Proposal to Reform the Natural Rubber Industry's Structure and Stabilise Farmers' Dealing Conditions in Thailand*", ERIA Research Project Report 2015-12, pp. 63-76. ERIA, Jakarta.

[11] Fazal O. and Kanwal S. (2017) "Determinants of brand loyalty: A case study of Asian mobile phone users", *International Journal of Scientific and Research Publications*, Vol. 7, No. 12, pp. 181-191. ISSN 2250-3153.

[12] Ismail, M., Zainol, F. A., Yusoff, M. N. H., Owusu, J. and Ibrahim, W. K. W. (2019) "Developing a co-operative sustainability model (CSM) in Malaysia: What is driving them?", *International Journal of Innovation, Creativity and Change*, Vol. 7, pp. 209-218. ISSN 2201-1315.

[13] Jalilvand, M. R., Pool, J. K., Nasrolahi, Vosta, S. and Kazemi, R. V. (2016) "Antecedents and consequence of consumers' attitude towards brand preference: Evidence from the restaurant industry", *Anatolia*, Vol. 27, No. 2, pp. 167-176. ISSN 2516-8142. DOI 10.1080/13032917.2015.1075223.

[14] Jung, J., Kim, S. J. and Kim, K. H. (2020) "Sustainable marketing activities of traditional fashion market and brand loyalty", *Journal of Business Research*, Vol. 120, pp. 294-301. ISSN 0148-2963. DOI 10.1016/j.jbusres.2020.04.019.

[15] Karjaluoto, H., Jayawardhena, C., Leppäniemi, M. and Pihlström, M. (2012) "How value and trust influence loyalty in wireless telecommunications industry", *The International Journal of Digital Economy: Telecommunications Policy*, Vol. 36, No. 8, pp. 636-649. ISSN 0308-5961. DOI 10.1016/j.telpol.2012.04.012.

[16] Kline, R. B. (2015) "*Principles and practice of structural equation modeling*", New York, Guilford publications, 534 p. ISBN 978-16-062-3876-9.

[17] Kositsurangkakul, K. (2003) "Customer Loyalty", *Productivity World Journal*, Vol. 7, No. 42, pp. 55-57.

[18] Kot, S. and Brzezinski, S. (2015) "Market orientation factors in sustainable development and corporate social responsibility", *Asian Journal of Applied Sciences*, Vol. 8, No. 2, pp. 101-112. ISSN 1996-3343. DOI 10.3923/ajaps.2015.101.112.

[19] Koupai, M. N. Alipourdarvish, Z. and Sardar, S. (2015) "Effects of trust and perceived value on customer loyalty by mediating role of customer satisfaction and mediating role of customer habit (case study: Agricultural internet bank customers in Tehran)", *Enzyme and Microbial Technology: Advanced Social Humanities and Management*, Vol. 2, No. 1, pp. 102-112. ISSN 01410229.

[20] Office of Agricultural Economics (2015) "*Agricultural Statistics of Thailand 2015*". [Online]. Available: http://www.oae.go.th/assets/portals/l/files/ebook/yearbook58.pdf [Accessed: June 25, 2018].

[21] Park, H. and Kim, Y. K. (2015) "Can a fashion brand be social?: The role of benefits of brand community within social network sites", *Journal of Global Fashion Marketing*, Vol. 6, No. 2, pp. 75-86. ISSN 2093 2685. DOI 10.1080/20932685.2014.999011.

[22] Petrick, J. F. (2002) "Development of a multi-dimensional scale for measuring the perceived value of a service", *Journal of Leisure Research*, Vol. 34, No. 2, pp. 119-134. ISSN 0022-2216. DOI 10.1080/00222216.2002.11949965.

[23] Petushkova, V.V. (2022) "China's experience and prospects for sustainable development", *Herald of the Russian Academy of Sciences*, Vol. 92, pp. 207-215. E-ISSN 1555-6492, ISSN 1019-3316. DOI 10.1134/S1019331622020095.

[24] Rubber Authority of Thailand Act, B. E. 2560 (2017) "*Rubber Authority of Thailand annual report 2017*". [Online]. Available: http://online.pubhtml5.eom/sibs/humw/#pM. [Accessed: June 20, 2018].

[25] Rubber Authority of Thailand Act (2017) "*Rubber Research Institute: Hot Issue*". [Online]. Available: https://library2.parliament.go.th/ebook/content-issue/25 5 9/hi25 59-032.pdf [Accessed: Jun. 20, 2018].

[26] Schumacker R. E. and Lomax R. G. (2004) "*A beginner's guide to structural equation modeling, Second edition*", Mahwah, NJ, Lawrence Erlbaum Associates. ISBN 978-08-058-4018-6.

[27] Slusarczyk, B., Smolag, K. and Kot, S. (2016) "The supply chain of a tourism product", A*ctual Problems of Economics*, Vol. 179, No. 5, pp. 197-207. ISSN 1993-6788.

[28] Trizano-Hermosilla I. and Alvarado J. M. (2016) "Best alternatives to Cronbach's alpha reliability in realistic conditions: Congeneric and asymmetrical measurements", *Frontiers in Psychology*, Vol. 7, pp. 769. ISSN 1664-1078. DOI 10.3389/fpsyg.2016.00769.

[29] Tucker, L. R. and Lewis, C. (1973) "The reliability coefficient for maximum likelihood factor analysis", *Psychometrika*, Vol. 38, pp. 1-10. E-ISSN 1860-0980, ISSN 0033-3123. DOI 10.1007/BF02291170.

[30] Tur-Porcar A., Roig-Tierno N. and Llorca Mestre A. (2018) "Factors affecting entrepreneurship and business sustainability", *Sustainability*, Vol. 10, No. 2, p. 452. ISSN 2331-1886. DOI 10.3390/su10020452.

[31] Wijaya, B. S. (2013) "Dimensions of brand image: A conceptual review from the perspective of brand communication", *European Journal of Business and Management*, Vol. 5, No. 31, pp. 55-65. ISSN 2222-2839.

[32] Yuen, K. F., Wang, X., Wong, Y. D. and Zhou, Q. (2018) "The effect of sustainable shipping practices on shippers' loyalty: The mediating role of perceived value, trust, and transaction cost", T*ransportation Research Part E: Logistics and Transportation Review*, Vol. 116, pp. 123-135. ISSN 1366-5545. DOI 10.1016/j.tre.2018.06.002.