The Need for Para Rubber Crop Insurance among Farmers in Trang Province (Thailand)

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Abstract

Para rubber is one of Thailand's principal economic products. Indeed, in terms of value, it is the country's leading export. Southern Thailand has the nation's largest cultivation area. However, various unexpected circumstances have resulted in losses for farmers. This investigation aims to study the need for para rubber crop insurance as a risk-management tool for farmers in Thailand's Trang province, focusing on a business called Wang Kee Ree Rubber Fund Cooperative Ltd, which complies with the Good Manufacturing Practice (GMP) guidelines and which will act as a pilot. The study applies a quantitative methodology involving descriptive and reference statistics, which were distilled using a statistical program. A questionnaire and convenience sampling were deployed to collect data. A sample of 180 farmers was selected from

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the population for this investigation, which consisted of the 300 farmers belonging to the above cooperative. The data analysis reveals that in 2019 most farmers were men, aged 51 or over and married and that they owned their farm and had an income of less than 20,000 baht per month. Fewer than two people in each household were able to tap rubber. Moreover, para rubber trees were mostly 10-20 years of age, producing around 41-60 kilograms of latex per day. Normally, those tapping rubber worked three days in a row and then had a day's break. Price fluctuations were the main problem facing rubber farmers, who desperately needed to take out a para rubber insurance policy because this could involve sharing the cost per household, as well as requiring compensation for hospital costs if they were injured. It was found that farmers urgently needed the relevant organisations to disseminate information about the respective policy. In light of the relationships between the factors, farmer- and para rubber growing-related variables were a significant pointer to the need for this insurance type. Finally, this study could be utilised in future to introduce a suitable policy for growers of para rubber.

Keywords: Crop Insurance, Farmers, Para Rubber, Thailand, Trang

Introduction

Para rubber is one of Thailand's most important economic products, leading the country's exports in terms of value. In 2017, this stood at around 1,355,501 million baht (approximately 368,333 million US dollars) (Office of Agricultural Economics (OAE), 2017). Para rubber trees spawn multiple lucrative derivative products, of which latex and smoked rubber sheets are just two examples. A number of research papers have investigated these, examining various stages from growing through to marketing. In a study of the impact of planting space on volumes of wood and latex yield of recommended rubber clones in the upper south of Thailand, Chusinuan, Damnoi, Suwanwikok, Srikul and Thummabumrong (2018)

found that in the investigated area a planting density of 3x4 metres and the use of clone RRIT 404 were advisable to maximise income and latex yield in the early tapping phase. Chuaibudda, Taweewat and Taweewat (2018) looked at the possibility of investing in concentrated latex manufacturing in Bueng Kan Province, drawing on the financial results of both Board of Investment of Thailand (BOI) and non-BOI cases among projects running for up to 10 years to conclude that this was a worthwhile investment. Based on information from the Rubber Authority of Thailand (RAOT) (2018), at the time its statistics were compiled, the country's para rubber tree-growing areas covered 14,256,631 rai (around 95,044 ha), and Southern Thailand had the country's largest cultivation area (representing 8,529,650 rai, or 60% of the total growing area), including 877,961 rai for Trang, the province under investigation here.

However, some unexpected circumstances have given rise to losses for farmers. Among these are natural disasters, para rubber disease and price fluctuations. Nugawela (2010) also suggested that the increasing cost of production and a shortage of skilled workers posed a problem and created a challenge for growers. Although there are entities which take action whenever such events occur, farmers still suffer from the adverse effect these have on their stabilising income, and some have not received enough support to continue their cultivation activities. Crop insurance plays a key role in this respect. Robert (2005) pointed out that there was a trend towards formalising risk management in farming, and insurance was one obvious tool that could be deployed to this end.

Crop insurance in Thailand, though, only provides coverage for a number of specific agricultural products (which do not include para rubber). In addition, the Office of Insurance Commission (OIC) (2020) states that crop insurance has been continuously developed in Thailand – a trend in recent years that started with rice crop insurance and crop insurance for grain (used for feeding livestock), before expanding to e.g. longan crop insurance. According to the same source, various aspects of para rubber crop insurance will be fleshed out (e.g. the

dissemination of knowledge and the adoption of scientific methods or technologies to conduct quick surveys of losses and to ensure prompt claim payments) to serve farmers' needs; and moreover, this anticipated insurance policy has already been incorporated into the OIC's fourth insurance development plan (2021-2025).

Peerabul (1985) revealed that socio-economic status affected crop insurance, and farmers who participated in the insurance pilots seemed to realise the benefits of an insurance policy more than those who were not involved in such initiatives. Kamchuan (2004) found that adopting appropriate legislation played an important role in insurance, with farmers' unwillingness to pay premiums, the government subsidies for some crops and the high risk facing insurance companies also being major issues to consider. The Bank of Agricultural Cooperation (BAAC) (2013) for the most part suggested that the main problem for rice farmers was drought, with just a small number of them joining insurance pilots as they were unaware of the risk to which they were exposed, and/or they were already receiving government support. Boyd, Pai, Zhang, Wang and Wang (2011) studied the level of crop insurance purchased in China on the basis of the following variables: knowledge of crop insurance, previous purchases of such insurance, confidence in the crop insurance company, the amount of risk taken on by farmers, the importance of low crop insurance premiums, the government as the principal source of information about crop insurance, the role of the head of the village, and the number of family members working in cities. In addition, they indicated that risk perception was positively related to the possibility of taking out insurance.

This study aims to investigate the need for para rubber crop insurance as a risk-management tool for farmers in Thailand's Trang Province, focusing on Wang Kee Ree Rubber Fund Cooperative Ltd. This business was chosen based on the suggestion by Duangmanee (2018) that it met the Good Manufacturing Practice (GMP) guidelines and therefore should serve as a pilot in this regard. Indeed, Wang Kee Ree Rubber Fund Cooperative Ltd (2018) reported that it had reached the required standard ever since the

establishment of these guidelines. Other factors that played a key role in the selection of this cooperative included its involvement in manufacturing para rubber products and the fact that it was clearly ready for further development.

In light of the above, this investigation could be used to establish a suitable policy for para rubber growers in future.

Conceptual Framework

A commonly cited human motivation theory that will be drawn on in this study is Maslow's hierarchy of motives (needs), developed in the 20th century by Abraham Maslow. Myers (2010) indicated that there are five levels in this hierarchy, which most often takes the form of a pyramid. Its lowest levels bring together the most basic needs, while the top levels feature the most complex needs (ibid.). Specifically, Coon (2003) and Lahey (2001) pointed out that from the lowest level to the highest, there are physiological needs, security and safety needs, social needs, esteem needs and self-actualisation needs. They also proposed that basic physiological needs cover items that are vital for survival, e.g. food and water, whereas self-actualisation needs refer to fulfilling one's potential. However, according to Myers (2010), Maslow suggested that certain individuals also achieve a degree of self-transcendence. Self-transcendence involves them seeking meaning, purpose and communion that is transpersonal (i.e. beyond the self) (Koltko-Rivera, 2006 as cited in Myers, 2010). Maslow believed that our higher-level, more fragile needs or motives are expressed only after we fulfil our basic, physiological needs (Coon, 2003; Lahey, 2001).

Uysal, Aydemir and Genç (2017) asserted that one aspect of safety needs is secured economically, with this forming the basis for the notion of insurance originating from the pension system and concerns such as fire, flooding and burglary. In addition, they claimed that when testing Maslow's theory by acquiring data from 21st-century workers, the theses

surrounding the hierarchy of needs remained valid and upper-level needs would only be fulfilled if lower-level needs were satisfied.

Figure 1 illustrates the conceptual framework in view of the aims of the investigation, demonstrating the importance of designing crop insurance for para rubber (i.e. a safety need in Maslow's hierarchy) in Thailand.
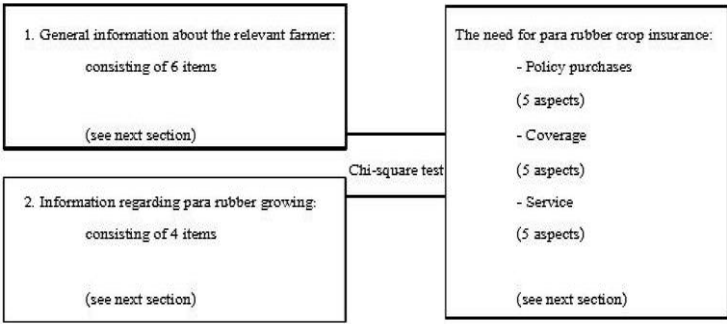

Figure 1 Conceptual framework

Methods

The population for the study consisted of the 300 farmers who were members of Wang Kee Ree Rubber Fund Cooperative Ltd, in Trang Province's Huai Yot District. Based on the Yamane formula, a sample size of 180 farmers was chosen. Data were collected using a questionnaire and convenience sampling. The reliability of the questionnaire was determined by calculating the Cronbach's alpha coefficient (based on a sample size of 30 farmers), whereby most social-science research adjudges a value of at least 0.70 to be 'acceptable'. The questionnaire covers the following main topics, most of which are based on the review literature:

1. General information about the relevant farmer:

    1.1 Gender

    1.2 Age

    1.3 Marital status

    1.4 Monthly income from tapping

    1.5 Household members able to tap rubber

    1.6 Ownership status

2. Information regarding para rubber growing:

    2.1 Problems facing growers

    2.2 Age of para rubber trees

    2.3 Daily production of latex

    2.4 Tapping period

3. The need for para rubber crop insurance:

    3.1 Policy purchases

        3.1.1 Sharing of the cost per household

        3.1.2 Transfer of risk to an insurance company

        3.1.3 Avoidance of the inability to deal with future problems

        3.1.4 Occurrence of natural risks

        3.1.5 Lack of confidence in government-related assistance

    3.2 Coverage

        3.2.1 Para rubber disease

        3.2.2 Para rubber-tree damage from natural hazards

        3.2.3 Benefits paid as a result of an accident during tapping causing

injury or disability

        3.2.4 Tapping-related death benefit

        3.2.5 Daily hospitalisation allowance

3.3 Service

3.3.1 Convenience of service

3.3.2 Promptness of indemnity payments

3.3.3 Speed of response to enquiries regarding para rubber crop

insurance

3.3.4 Even-handedness of the service provided to all parties

3.3.5 Dissemination of information about para rubber crop

insurance

The statistical program SPSS was used, with descriptive statistics (percentages for the first and second sections of the questionnaire, and mean values (with mean values that lie between 3.41 and 4.20 being interpreted as 'Agree', and those that are between 4.21 and 5.00 corresponding to 'Strongly agree') and standard deviation for its third section) and reference statistics (chi-square test (Keller, 2009; Kerlinger & Lee, 2000; Bordens & Abbott, 2008)) being applied for the data analysis.

$$\chi^2 = \frac{\sum(O_i - E_i)^2}{E_i}$$

where χ^2 represents the chi-square test for independence;

O_i represents an observed value;

E_i represents an expected value;

and a 0.05 significance level ($\alpha = 0.05$) is defined.

In the third section of the questionnaire, the Likert scale was applied – in other words, each of the questions there had a set number of responses for farmers to choose from, ranging from 5 for 'Strongly agree' to 1 for 'Strongly disagree').

Results

Following collation of the data, the results were evaluated. The reliability of the questionnaire is indicated by a Cronbach's alpha coefficient value of 0.75. Even though the envisaged sample size was 180, a total of 204 farmers participated in this survey. Therefore, the outcome for all 204 farmers is presented here. The first part of the analysis given below covers the responses providing general information about farmers. This is followed by a look at the results of the section of the questionnaire supplying information regarding para rubber growing. After that, the need for para rubber crop insurance is addressed. Subsequently, details are set out of the chi-square test for the independence of the items pertaining to the general information about farmers vis-à-vis those relating to the need for para rubber crop insurance. Last but not least, we present a discussion of the results.

General information about farmers

The general information about farmers gathered from the study is shown in Table 1. At the time the survey was conducted in 2019, most farmers were male, accounting for 53.4% of the sample, with those aged over 50 representing 35.8% and married individuals making up 71.6% of the total. Those with a monthly income of less than 20,000 baht made up 93.2% of respondents. Moreover, in 84.8% of cases, fewer than two people in each household were able to tap rubber, and most of the sample (52%) owned their farm.

Table 1 General information about farmers

Item	Number of individuals	Percentage of the sample
1.1 Gender		
Male	109	53.4
Female	95	46.6
Total	204	100

Table 1 Continued

Item	Number of individuals	Percentage of the sample
1.2 Age		
Under 20	8	3.9
20-30	30	14.7
31-40	39	19.1
41-50	54	26.5
Over 50	73	35.8
Total	204	100
1.3 Marital status		
Single	46	22.5
Married	146	71.6
Divorced	5	2.5
Other	7	3.4
Total	204	100
1.4 Monthly income from tapping		
< 10,001 baht	95	46.6
10,001-20,000 baht	95	46.6
20,001-30,000 baht	12	5.9
> 30,000 baht	2	0.9
Total	204	100
1.5 Household members able to tap rubber		
1-2 people	173	84.8
3-4 people	130	14.7

Table 1 Continued

Item	Number of individuals	Percentage of the sample
5 people or more	1	0.5
Total	204	100
1.6 Ownership status		
Yes	106	52.0
No	98	48.0
Total	204	100

Information regarding para rubber growing

As shown in Table 2, rubber farmers considered price fluctuations to be the main problem facing them (with 52.3% deeming this to be an issue). Moreover, most para rubber trees (77.0% of these) were 10 20 years of age, and the most widespread latex production level (30.9%) was around 41 60 kg per day. The lion's share of farmers (75.0%) worked three days in a row before having a day's break

Table 2 Information regarding para rubber growing

Item	Number of individuals	Percentage of the sample
2.1 Problems facing growers (more than one choice possible)		
Natural disasters	66	19.8
Para rubber disease	92	27.6
Price fluctuations	174	52.3

Table 2 Continued

Item	Number of individuals	Percentage of the sample
Other problems	1	0.3
Total	333	100
2.2 Age of para rubber trees		
< 10 years	21	10.3
10-20 years	157	77.0
21-30 years	26	12.7
Total	204	100
2.3 Daily production of latex		
< 21 kg	6	2.9
21-40 kg	44	21.6
41-60 kg	63	30.9
61-80 kg	47	23.0
> 80 kg	44	21.6
Total	204	100
2.4 Tapping period		
Every day	4	2.0
Every other day	5	2.5
Three days in a row and then a day's break	153	75.0
Four days in a row and then a day's break	36	17.6
Other	6	2.9
Total	204	100

The need for para rubber crop insurance

Table 3 sets out the results regarding the need for para rubber crop insurance in three areas, namely policy purchases, coverage and service. The findings reveal that at the time of our investigation, farmers did indeed need this type of insurance in the three domains just mentioned. For policy purchases, the sharing of the cost per household was considered the most important need, with a mean value of 3.93 and a standard deviation (SD) of 0.83. As regards coverage, farmers most required daily hospitalisation allowance, with a mean value of 4.21 and a standard deviation of 0.87. Turning to service, their principal need was the dissemination of information about para rubber crop insurance by the relevant organisations, with again a mean value of 4.21 and a standard deviation of 0.87.

Table 3 The need for para rubber crop insurance

Item	Mean	SD	Interpretation
3.1 Policy purchases			
3.1.1 Sharing of the cost per household	3.93	0.83	Agree
3.1.2 Transfer of risk to an insurance company	3.63	0.80	Agree
3.1.3 Avoidance of the inability to deal with future problems	3.68	0.85	Agree
3.1.4 Occurrence of natural risks	3.73	0.80	Agree
3.1.5 Lack of confidence in government-related assistance	3.70	1.05	Agree
Average	3.73	0.88	Agree
3.2 Coverage			
3.2.1 Para rubber disease	4.10	0.79	Agree
3.2.2 Para rubber-tree damage from natural hazards	4.20	0.75	Agree

Table 3 Continued

Item	Mean	SD	Interpretation
3.2.3 Benefits paid as a result of an accident during tapping causing injury or disability	4.19	0.79	Agree
3.2.4 Tapping-related death benefit	4.18	0.87	Agree
3.2.5 Daily hospitalisation allowance	4.21	0.87	Strongly agree
Average	4.18	0.81	Agree
3.3 Service			
3.3.1 Convenience of service	4.13	0.76	Agree
3.3.2 Promptness of indemnity payments	4.13	0.84	Agree
3.3.3 Speed of response to enquiries regarding para rubber crop insurance	3.98	0.74	Agree
3.3.4 Even-handedness of the service provided to all parties	4.06	0.79	Agree
3.3.5 Dissemination of information about para rubber crop insurance	4.21	0.74	Strongly agree
Average	4.10	0.78	Agree

The chi-square test

In this part, a chi-square test for independence, comparing two variables to check whether they are related, was applied. Table 4 presents only the significant relationships at a significance level of 0.05 between some aspects of the general information about farmers and some items pertaining to the need for para rubber crop insurance. Farmers' gender was significantly related to the speed of response to enquiries regarding para rubber crop insurance, with a chi-square value of 7.995 (sig. = 0.046). Meanwhile, farmers' age affected their need

for convenience of service, with a chi-square value of 31.763 (sig. = 0.011). Marital status was related to a number of factors, the most important being the need for a daily hospitalisation allowance, with a chi-square value of 37.124 (sig. = 0.000). At the same time, farmers' monthly income from tapping also had an influence on the need for a daily hospitalisation allowance, with a chi-square value of 24.408 (sig. = 0.018). The number of household members able to tap rubber was significantly related to the need for tapping-related death benefit and dissemination of information about para rubber crop insurance, with chi-square values of 53.633 (sig. = 0.022) and 51.033 (sig. = 0.000), respectively.

Table 4 The chi-square test applied to information about farmers and the need for para rubber crop insurance

Farmer-related factor	Need-related factor	Chi-square	Sig.
1. Gender	**Service**		
	1. Speed of response to enquiries regarding para rubber crop insurance	7.995	0.046*
2. Age	**Service**		
	1. Convenience of service	31.763	0.011*
3. Marital status	**Policy purchases**		
	1. Sharing of the cost per household	22.884	0.029*
	Coverage		
	1. Para rubber-tree damage from natural hazards	20.151	0.017*
	2. Tapping-related death benefit	26.374	0.010*

Table 4 Continued

Farmer-related factor	Need-related factor	Chi-square	Sig.
	3. Daily hospitalisation allowance	37.124	0.000*
	Service		
	1. Convenience of service	35.606	0.002*
	2. Even-handedness of the service provided to all parties	30.606	0.002*
	3. Dissemination of information about para rubber crop insurance	30.425	0.000*
4. Monthly income from tapping	**Coverage**		
	1. Daily hospitalisation allowance	24.408	0.018*
5. Household members able to tap rubber	**Coverage**		
	1. Tapping-related death benefit	53.633	0.000*
	2. Dissemination of information about para rubber crop insurance	51.033	0.000*

Table 5 illustrates only the significant relationships at a significance level of 0.05 between some aspects of the information regarding para rubber growing and some elements associated with the need for para rubber crop insurance. Price-fluctuation problems were significantly related to the need for promptness of indemnity payments, with a chi-square value of 11.494 (sig. = 0.022). Meanwhile, the daily production of latex affected the need for a daily hospitalisation allowance and convenience of service, with

a chi-square value of 43.780 (sig. = 0.000) and 47.120 (sig. = 0.000), respectively. In contrast, the age of para rubber trees and the tapping period were not related to the need for para rubber crop insurance.

Table 5 The chi-square test applied to para rubber growing and the need for para
          rubber crop insurance

Para rubber growing-related factor	Need-related factor	Chi-square	Sig.
1. Problems facing growers	**Policy purchases**		
	1. Promptness of indemnity payments	11.494	0.022*
2. Daily production of latex	**Coverage**		
	1. Daily hospitalisation allowance	43.780	0.000*
	Service		
	2. Convenience of service	47.120	0.000*

Discussion

In conclusion, this study, which aimed to examine the need for para rubber crop insurance as a risk management strategy for farmers in Thailand's Trang province with a focus on Wang Kee Ree Rubber Fund Cooperative Ltd, shows that when our survey was carried out in 2019, the para rubber farmers in the sample were mostly male and married, with these individuals ensuring that the various steps required of rubber plantations were followed, starting with preparing plots of land and culminating in the tapping and sale of the rubber.

Furthermore, fewer than two people in each household – likely to be the mother and father – were able to tap rubber. Usually they were more than 50 years old, meaning that they were skilled harvesters as they would tend to have started their business in this domain at a young age. The results also indicate that price fluctuations were the main problem facing rubber farmers.

This investigation reveals that at the time of the survey, rubber trees that were 10-20 years of age produced around 41 60 kg of latex per day, and the farmers in the area in question worked three days in a row before having a day's break, as this was another way of keeping rubber trees healthy with a view to extending their economic life span.

As regards para rubber crop insurance, the findings from the questionnaire show that rubber farmers were interested in taking out a policy because of the need to share the cost per household, resulting in them requiring a daily hospitalisation allowance. In addition, given the widespread lack of awareness regarding potential para rubber crop insurance, the dissemination of information about this now appears to be absolutely vital. These findings are consistent with the hypothesis in Boyd, Pai, Zhang, Wang and Wang (2011) that if farmers realise the risk they encounter, they are likely to seek insurance. It is also in line with the OIC's fourth insurance development plan, according to which the dissemination of insurance data to farmers should be carefully thought through (OIC, 2020).

It was found that in view of the relationships between the variables, farmer- and para rubber growing-related factors were a significant indicator of the need for such insurance. It would clearly be worthwhile for the relevant entities to draw on the appropriate factors in designing assistance or insurance policies for rubber farmers, specifically the speed of response to enquiries, the convenience of service, para rubber-tree damage from natural hazards, tapping-related death benefit, a daily hospitalisation allowance, even-handedness of the service provided to all parties, and promptness of indemnity payments. This investigation suggests that for such farmers ownership of their farm, the age of para rubber trees, and the

tapping period had no influence on their need for this type of crop insurance. In future, this study could be leveraged to devise a suitable policy targeting para rubber growers, and the geographical area under investigation could be expanded.

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