

# Developing A Theoretical Model Of Agriculture Takaful For Paddy Farmers In East Coast Malaysia

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*Abstract— The agriculture industry is one of the sectors most susceptible to climate change. Variations in climate, ranging from erratic rainfalls, prolonged dry spells and extremes in temperature may affect the agriculture community in terms of price and production. Insects and diseases stemming from weather related conditions can also impact both quality and yield of a crop. The effects of these weather risks can be broadly summarized into two; namely price and production risks. Price risks are risks associated with fluctuations in the market price of the agriculture commodities; whilst production risks encompass variations in the output and quality of the agriculture commodities. In recent years, natural disasters have wrecked havoc and devastation worldwide. Since climatic change is inevitable, developing countries whose economies are highly dependent on agriculture, have devised innovative strategies to increase yields and crops resistant to climatic risks, same goes to Malaysia. In accordance, Malaysian government has been introduced insurance to the agriculture sector known as Paddy Takaful Scheme Insurance that focused to the paddy farmers in the Budget 2013. Therefore the needs of the target market should be defined properly to enable the insurance providers as well as the government to develop sound strategies. Their opinions, perceptions and attitudes towards this insurance scheme product have to be gathered and interpreted. Understanding the perceptions of the target market and aligning it with the proposed insurance model are essential in determining the success and acceptance of crop insurance among the paddy farmers.*

**Keywords— Agriculture Takaful; Paddy Farmers; East Cost**

## I. INTRODUCTION

The agriculture sector is seen as an important economic arm of any country as it is able to generate income and thus able to continue the food supply. Despite being an important engine of growth, this sector is exposed to major risks. Natural disasters are seen as one of the hindering factors that will also affect investments in the agricultural sector. The existence of high risk is likely to undermine the development potential of the sector in generating the economy. Hence, if not much

investment is channel into this sector it will reduce the amount of production, therefore leading to food shortages [1].

In addition, agriculture sector contribution in the rural revolution and the national economy is seen along with its structural characteristics require extensive government and financial sector interventions to ensure sustainability of this important sector. [2].

On the other hand, paddy is a major crop and staple food which recently has become one of the focus of the transformation of government policy. Despite the many government incentives and benefits given to this sector, the paddy farmers are still surrounded by the poorest in the country. Besides that, climate change, natural disasters, diseases and pests attack and are also seen as threats to paddy plantation.[3]. According to budget 2013, government introduce a Takaful scheme for paddy farmers with an allocation of RM 50 million set aside for this purpose and is projected to benefit roughly 172,000 paddy farmers. In addition, the insurance scheme is introduced to reduce the losses faced by the farmers. For example, worm attacks on a large scale in Kelantan, in early 2012, has resulted in scratch to the rice to a large number of paddy field operators in the area and it shows that paddy, although highly important, is a crop exposed to high-risk factors.

### A. Background of study

Agriculture has been identified as a prospective economic sector for generate the nation's income and is the third most important sector for economic growth. In terms of land usage, about 2% from the whole agricultural lands are planted with crops such as palm oil, cocoa, rubber, coconut, vegetables and fruits. [4]. Throughout the Malaysia Ninth Plan, the government has put larger importance and observation to the agricultural sector. Besides that, new agricultural activities that involve larger scales have been monitor with emphasis on the usage of modern technology by farmers for ensure only high quality products are produced. In addition to this, services related to agriculture has been revise and planned. Agricultural sector

which contribute to about 10% of GDP has almost a third of the population depending on this sector as their source of income for living; with an average of 14% of them working at farms and plantations. [5]. This segment is dominated, however, by poor or low-income workers. On the other hand, the climatic changes, weather factors, the variable of commodity prices, changes in consumers' demand, pests and harmful diseases will not only have an effect on production quality but to the socio economics' particularly to those working in this sector . [6].

In general, Malaysia's experience with risk is still controllable as compared to some other countries [7]. However, changes in climate have been the government's main concern for a long time. Risk mitigation measures have been restricted to outdated traditional methods and may have somewhat be effective in small losses but pointless to say, may not be applicable in cases where the impact is massive [8].

### B. Research objectives

The study aims to:

- Identify risks faced by farmers, in terms of frequency and severity.
- To investigate factors influencing the intention to participate in Agriculture Takaful
- To develop theoretical framework for Agriculture Takaful in East Cost Malaysia

## II. LITERATURE REVIEW

### A. Risk and Agriculture

The agriculture sector is a risk-prone sector. Climate and weather risks, diseases, pests and insects are among the array of risks that can affect production outcomes. Production outcomes are further exacerbated by price and credit risks, technological and institutional risks. (Andrews, Jaffer and Siegal, 2008; Anton & Kimura, 2011). Climate change, which is inevitable, has caused huge losses to the agriculture sector in Malaysia. Losses can be in the form of physical damage, lost of crop harvest, drop in productivity, vigor are some examples of direct and indirect effects of the extreme climate change (Baharuddin, 2011). The effects of climatic risks are felt more acutely at the household level, particularly by poor, vulnerable agricultural households, the majority of which are subsistence farmers. Thetraditional risk management methods employed by these farmers may work well with losses of low severity, but are proven to be inadequate for larger risks even if occurrences are infrequent. To combat these risks, governmentmeasures such as adaptations to high yielding crop varieties, improvements in water management, changes in planting techniques and scheduling, subsidies in seedlings and fertilizers are being used to minimize the negativeeffects of these risks. Despite these efforts, farmers continue to be among the poorest in the social stratum.Paddy is the staple diet

in Malaysia, depends greatly on climatic conditions for its cultivation. This major crop hasrecently become one of the focuses of the transformation policy of the government. The budget 2013 introduce an insurance scheme for paddy farmers with an allocation of RM 50 million set aside for this purpose and is expected to benefit approximately 172,000 paddy farmers. [9].Considering that many paddy farmers are still living in poverty, the insurance scheme is introduced to minimize the losses faced by the farmers and indirectly improve the financial situation of the farmers. Incidences of floods that hit several states including Kelantan around 2010 have resulted in huge losses to nearly all the land belonging to the farmers. This clearly shows that paddy, although highly important, is a crop exposed to high-risk factors.

### B. Insurance in Agriculture

The agriculture sector is a risk-prone sector. Climate and weather risks, diseases, pests and insects are among the array of risks that can affect production outcomes. Production outcomes are further exacerbated by price and credit risks, technological and institutional risks. (Andrews, Jaffer and Siegal, 2008; Anton & Kimura, 2011). Climate change, which is inevitable, has caused huge losses to the agriculture sector in Malaysia. Losses can be in the form of physical damage, lost of crop harvest, drop in productivity, vigor are some examples of direct and indirect effects of the extreme climate change (Baharuddin, 2011). The effects of climatic risks are felt more acutely at the household level, particularly by poor, vulnerable agricultural households, the majority of which are subsistence farmers. [10].The traditional risk management methods employed by these farmers may work well with losses of low severity, but are proven to be inadequate for larger risks even if occurrences are infrequent. To combat these risks, government measures such as adaptations to high yielding crop varieties, improvements in water management, changes in planting techniques and scheduling, subsidies in seedlings and fertilizers are being used to minimize the negative effects of these risks. Despite these efforts, farmers continue to be among the poorest in the social strata.Paddy is the staple diet in Malaysia, depends greatly on climatic conditions for its cultivation. This major crop hasrecently become one of the focuses of the transformation policy of the government. [10]. The budget 2013 introduce an insurance scheme for paddy farmers with an allocation of RM 50 million set aside for this purpose and is expected to benefit approximately 172,000 paddy farmers. Considering that many paddy farmers are still living in poverty, the insurance scheme is introduced to minimize the losses faced by the farmers and indirectly improve the financial situation of the farmers. Incidences of floods that hit several states including Kelantan around 2010 have resulted in huge losses to nearly all the land belonging to the farmers. This clearly shows that paddy, although highly important, is a crop exposed to high-risk factors.

To investigate the paddy farmers' intention to participate in Agriculture Takaful, the Theory of Planned Behavior is used in this study. There are three main components in this Theory of Planned Behavior that explain further the intention to behave, such as attitudes, subjective norm and perceived behavioral control. Basically, the Theory of Planned Behavior is an extension from the Theory of Reasoned Action

#### 1) *Attitude*

Theory of Reasoned Action states that attitudes are a function of beliefs. In other words, when a person believes that performing a given behavior will lead to mostly positive outcomes, he or she will be more tending to perform the behavior. stated that Attitude towards behavior is determined by a person's evaluation of those outcomes as either negative or positive. An individual is more probable to assume a certain behavior if she or he has a positive attitude toward undertaking the behavior [9]. This point was supported by [10] indicating that the performance of a particular behavior is connected to the individuals' attitude in the object.

#### 2) *Subjective Norm*

The second determinant of intention is subjective norm. Subjective Norms can be explained as social pressures that a person perceives directly to the individual in engaging in a specific behavior. The more social pressure a person perceives to be connected to a behavior, the more possible it is that the individual will perform the behavior. Subjective norms are frequently evaluated by assessing the social pressure a person perceives from specific individual such as parents, friends, relatives or influential people

In addition, the Subjective Norm refers to how the social pressures influence the person's perception to perform the behavior [11]. In summary, Subjective Norms refer to the influence of others towards the behavior of an individual. Furthermore, Subjective Norm is a function of beliefs in the Theory of Planned Behavior. If a person believes that the people around them will influence them to perform the behavior, then the Subjective Norm should influence the intention of the person to perform the behavior.

#### 3) *Perceived Behavior Control*

The final major predictor in Theory of Planned Behavior is Perceived Behavior Control. Perceived Behavioral Control is another determinant added in the Theory of Planned behavior. Perceived Behavioral Control refers to the degree of control that an individual perceives over performing the behavior

reiterated that Perceived Behavior Control is the degree to which a person feels able to connect in the behavior. It has been divided in two aspects, which is how much a person has control over behavior, and how confident a person feels about being able to perform or not performing the behavior. According to [14], Perceived Behavioral Control can report for considerable variance in behavioral intention and actions. Furthermore, factors such as time, money, skills can help to

increase and control the people perception and increase the behavioral intention.

#### 4) *Perceived risk*

Feelings of anxiety from traumatic events experienced by farmers have encouraged each individual to protect themselves in various ways [20]. The act of purchasing property insurance is one of the efforts that can be carried out by each individual to protect their properties from harm. Subsequently, this increase and reduction efforts based on the results of protection can also come in the form of increased demand for life insurance. Most individuals re-evaluate their decision to take a policy in insurance after experiencing the sight of the damage and destruction caused by several events of disaster. Accordingly, individuals will feel more responsible and being more proactive in protecting themselves from the risk of death due to various factors .

were of opinion that, losses in natural disasters can often be so cruel and large that they dominate people's assessment of the risk they face. In order to secure property, health, and financial assets of individuals, such cognitive adjustments could be responsible for changes in the demand for products. A study by [18] in Golestan one of the provinces in Iran found that factors such as age, farm size, product diversification, the level of insurance for other crops and sustained record of previous risk as having negative relationships with the elasticity and tendency to purchase soy insurance. Besides that, the amount of credit received by farmers is also seen to have positive effects and is able to influence farmers' decision to buy insurance.

[19] expanded the analysis on Perceived risk even further and came out with findings on the amount of risk taken on by farmer which shows a positive association with their attitude to purchase crop insurance. The positive coefficient reveals that farmers who take on more risks will be more probable to purchase crop insurance. These findings also imply that farmers who take on lesser risk would purchase lesser crop insurance, which reflects their reduced needs for crop insurance. This implies that risk variable measures how much risk the farmer believes they are taking on in their general farming operations.

#### 5) *Intention to purchase*

Intention can be defined as a person's position on a subjective probability dimension linking with a relation between himself and several actions . Another definition by s, on the other hand defines intention as the motivation for individuals to engage in a certain behavior. Based on the Theory of Planned Behavior model (TPB), intention is the immediate determinant of an individual behavior either to perform or not perform it [16]. According to [8], behavioral intention is defined as the individual's subjective likelihood that he or she will connect in that behavior.

The Theory of Reasoned action (TRA) explains the intention of a person is the determining basis of two functions which is personal in nature and the other reflecting social influence [12]. The personal aspect is the individual's positive

or negative evaluation of performing the behavior. This factor is termed attitude toward the behavior [8]. These two theories have been used widely to predict a person's behavioral intention as a combination of three basic variables Attitudes towards the behavior, Subjective Norm, and Perceived Behavioral Control [21].

### III. RESEARCH METHODOLOGY

The descriptive research are using in this study where it employing the survey method through the distribution of questionnaires as instrument.

Questionnaires were personally administered to make sure a high response rate. Using quota sampling, a total of 336 respondents, comprise paddy farmers from paddy growing areas in Kedah participate in this survey. Besides descriptive statistics, Pearson Correlation was also employed to establish the relationship between the variable. Cronbach Alpha was also tested for reliability and validity; whereby result for alpha for the overall questions is result 0.967 indicating that it is acceptable.

### IV. DATA ANALYSIS

#### A. Demographic data

TABLE I. DEMOGRAPHIC PROFILE

Categories	Frequency	Percentage (%)	
Gender	Male	292	86.9
	Female	44	13.1
Age	21-29	24	7.1
	30-39	29	8.6
	40-49	123	36.6
	50 and above	160	47.6
Education level	Do not attend school	23	6.8
	Primary school	105	31.2
	Secondary school	175	52.1
	Certificate	24	7.1
	Diploma/ Degree/ Others	9	2.7
	Number of dependents	1-3	116
4-6		168	50
7-10		47	14
More than 10		5	1.5
Type of ownership	Rent	140	41.7
	Own	159	47.3
	Lease	22	6.5
	Others	15	4.5
Monthly income	< RM 1000	147	43.8
	RM 1001-RM 2000	104	31.0
	RM 2001-RM 3000	53	15.8
	RM 3001	32	9.5

Duration work on paddy fields	>1 year	116	6.8
	1-5 year	44	13.1
	6-10 year	54	16.1
	>10 year	215	64.0
Size of acreage	1-3 hectare	158	47.0
	4-6 hectare	91	27.1
	7-9 hectare	48	14.3
	10 hectare and above	39	11.6

For the demographic information obtained from the respondents included gender, age, education level, type of ownership, monthly income, the period involves in paddy plantation, and size of crop area. This information was deemed needed for this study in order to determine the demographic profile of farmers that affect the farmers' intention to participate in Agriculture Takaful.

About 336 questionnaires distributed at random to farmers. Out of 336 respondents, 292(86.9%) are male while the majority of respondents are more than 50 years old. In addition, there is 61.9% respondents hold secondary school qualifications and beyond. Approximately half of the respondent (47.3 %) own the paddy field. Most of the respondents earn monthly income of RM1000 and below per month. Majority of respondents are involved in paddy plantation for more than 10 years and it is about 158 (47%) paddy farmers have size of land between 1 to 3 hectare size of acreage.

#### B. Frequency and Severity

TABLE II. FREQUENCY AND SEVERITY TABLE

Risks	Frequency	Percentage (%)	Rank of risk
<u>Most severe:</u>			
Flood	60	17.8	2
Drought	11	3.27	4
Pests Attack	235	70.0	1
Storm	30	8.93	3
<u>Most frequent:</u>			
Flood	75	22.32	2
Drought	20	5.95	4
Pests Attack	198	58.93	1
Storm	43	12.78	3

In terms of severity of losses, the respondents rank pest attack as highest ( 70%), followed by flood (17.8%), storm (8.93%) and the lowest is drought (3.27%). In conditions of risks, most frequently faced by farmers, 198 (58.93%) farmers ranked pests attack as the risk they frequently faced. Additionally, 75 (22.32%) farmers ranked flood as the second risk they frequently faced, 43 (12.78%) farmers ranked storm and 20 (5.95%) farmers ranked drought.

### C. Descriptive Analysis

TABLE III. DESCRIPTIVE ANALYSIS

variable	Mean	Std. Deviation
Subjective Norm	4.24	0.95
Perceived Risk	4.60	0.89
Perceived behavioral control	4.33	1.13
Attitude	4.28	1.09
Intention to participate	4.49	0.96

Based on Table III, respondents were asked to point out their perceptions and agreement towards the statement in the questionnaires by using the six points Likert Scale answers. The scales were ranged between 1= strongly disagree to 6= strongly agree. An even numbered scale would not have a midpoint and thus, forced respondents to make a choice [14].

The overall mean for intention to participate in Agriculture Takaful was 4.49 (sd= 0.95), Perceived risk was 4.60 (sd=0.89), Attitude was 4.28 (sd=1.09), Perceived behavior control was 4.33 (sd=1.13), and Subjective Norm was 4.24 (sd=0.95).

Based on the results, it can be summarize that most of the respondents which are agree to participate in this Agriculture Takaful where the majority of the answers fall at point of 4, which is, they agree to each statement.

### D. Regression Analysis Coefficient

TABLE IV. COEFFICIENT

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.042	.334		3.124	.002
	Subjective Norm	-.055	.118	-.054	-.464	.643
	Perceived risk	.369	.108	.288	2.881	.000
	Perceived behavioral control	.312	.088	.235	4.190	.346
	Attitude	.460	.256	.164	1.795	.000
a. Dependent Variable: Intention to participate p value < 0.05						

Regression analysis of coefficient test as exhibited in Table IV is used to test the coefficient between independent variables and dependent variable. The results from the table shows that Beta of Perceived Risk is (0.288), followed by Attitude (0.164), Perceived Behavior Control (0.235), Subjective Norm (-0.54). Based on the result, Perceived Risk has the highest impact on paddy farmers' intention to participate in Agriculture Takaful .

In addition to this, only two variables which are Perceived risk (p=0.000) and Attitude (p=0.000) are significant predictors on the intention to participate in Agriculture

Takaful. The others variables which are Subjective Norm (p=0.643) and Perceived Behavior Control (p=0.346) are not predictors of intention to participate in Agriculture Takaful.

### V. DISCUSSION

In this study, Perceived Risk has been recognized as the factor most influence on paddy farmers' intention to participate in Agriculture Takaful, with a beta value of (0.288) as the highest among all the variable. In general, the responsiveness of risk is also important in risk management because it increases the level of education among the individual . [3] also supported this finding and added that Perceived Risk ia also a significant factor that contribute towards farmers' intention to purchase crop Insurance. This also clarify the fact that perception on past experiences that lead farmers to take part in Crop Insurance. [5] also claim in their studies that risk perception shows a positive and significant relationship with the Attitude to purchase Crop Insurance. The positive coefficient demonstrate that the more risks they faced in their past time; the more probable they are to purchase Crop insurance [15].

The results on Attitude variable is constant with the research conducted by [19] who discussed that Attitude has a significant impact on farmers towards Private Crop Insurance. The study also explained the farmers' satisfaction towards private crop Insurance which influenced them in a straight line lead to their attitude to participate in the scheme and further built a positive attitude.

### VI. CONCLUSION

As a conclusion, the findings of this study showed the two scope which are Attitude and Perceived Risk can be used to forecast the paddy farmers' intention to participate in Agriculture Takaful. On the risks faced by the farmers, the findings identified that risks frequently experienced by farmers are those related to pest attacks. In terms of severity and economic loss, the risks are also pests attack.

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