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Crop Insurance Scheme Among Paddy Farmers in Kedah, Malaysia: Are They Willing to Pay?

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Abstract

This study examines the farmers' willingness to pay (WTP) in contributing to the Crop Insurance Scheme (CIS) specifically among the paddy farmers in Kedah. The CIS reduces the risk that farmers face in the event of natural disaster such as flooding or crop failure causes from pest attack and crop diseases. In this study, we focus on three selected districts in Kedah. A total of 139 respondents were randomly selected from these areas. The CIS is based on a hypothetical product which contain of three main attributes; (1) type of coverage, (2) sum assured/benefit, (3) and premium payment or the price. Data are obtained by applying Choice Experiment (CE) technique and analyzed with the multinomial logit model (MNL). Two models are presented in this paper namely the basic model and the interaction model. The study shows, among others, that marginal willingness to pay to obtain protection from crop failure amongst the attributes ranges between RM33.69 to RM128.63 per year for the basic model. On the other hand the marginal willingness to pay for the interaction model ranges between RM19.42 to RM73.32.

Keywords: Uillingness to pay; Crop insurance scheme; Multinomial logit; paddy farmers; Choice experiment technique.

1. Introduction

Rice is the staple food in Malaysia. Currently the production of paddy in Malaysia cannot support the local demand. In 2017, Malaysia continues to depend on rice imports as the country's production is nearly 30% short from the three million metric tonnes (MT) self-sufficiency level (SSL) (Malaysian Reserve, 2017). Despite all the government incentives given to paddy farmers, the production seems not to increase as expected.

The challenges in planting paddy seems great because of the perception of youth on paddy sector as unglamorous job and an unstable income also contribute to slow development in paddy production. Other challenges in the production of paddy are also due to its vulnerability towards weather and attack from pests.

Extreme weather such as too much rain can causes flood. Flood will submerge the paddy plantation and spoilt the crops. The occurrence of storm during the rainy season can also be a threat. The paddy plants will fell off or break before it reaches maturity and ready to be harvested. Based on statistics published by the Majlis Keselamatan Negara (2009), *MajlisKeselamatan Negara* (National Security Council), for the period of 2005-2007, the number of flood victims in Malaysia is between 26,000 to 39,000 families (or between 100,000 and 148,000 people). In terms of damage to properties owned by individuals and the government was estimated reaching to RM1 billion. To emphasize the magnitude, the December 2007 flood, the cost of damage suffered by the flood victims was about RM38 million while the properties damage incurred by the government was about RM813 million. In terms of economic activity, the damage in the agricultural sector was about RM56 million and claimed 33 lives.

Another threat to the paddy plantation is the attack from pest such as snails, grasshoppers, rice bug and crop diseases either bacterial or fungal base disease. Threat from pests is in every stage of the paddy starting from the day it is planted until the day of the harvest.

The Malaysian government offer a lot of incentives to paddy farmers, such as subsidies on production and also subsidies on fertilizers and pesticides. Another incentive that offered by the government is covering paddy lost due to flood. This is announced during the 2013 National Budget presentation by the prime minister who is also the finance minister, as depicted from the 2013 Budget Speech (Office of the Prime Minister, 2013).

"In line with the Government's commitment to safeguard the *rakyat*'s (citizen's) welfare, particularly paddy farmers, the Government will introduce for the first time a Paddy Takaful Coverage Scheme (SPTP). The scheme is expected to benefit 172,000 paddy farmers who own fields less than 10 hectares. Total compensation to be received by each farmer is estimated at RM13,000. The Government will initially allocate RM50 million for this scheme."

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The intention of this scheme is to provide a better help to lighten the burden face by the small scale farmers as compared to the current practice of giving direct aid by the government in the event of paddy loss due to flood. The aid is in term of cash ranging between RM500.00 to the maximum of RM800.00 per hectare, depending of on the stage of the crops. Obviously, the direct aid is too low to the farmers and become a constant burden to the government who need to folk out quite a large portion of the budget allocated to the agriculture sector. The introduction of SPTP obviously sounds more benefiting to the farmers with a ceiling of RM13,000. However, it will need certain amount of contribution to the insurance market system.

Although crop insurance scheme (CIS) was announced during the 2013 budget presentation, until to-date in 2018 the details of how it will operate remain unclear both to the farmers and the insurance providers. The most important questions of how the CIS will be operated are:

1. Will farmers have to pay for the premium or at least part of the premium?
2. How will the compensation be calculated?
3. What are the damages covered by the CIS?

This study only tries to answer question number one to discover to what extent the farmers willing to pay for CIS should it is offered in the market. By knowing the farmers' WTP, it will help policy makers to estimate and allocate the fund for such scheme to be implemented.

In general, this study aims to evaluate the perception of farmers on the proposed implementation of the CIS and to estimate the farmers' WTP for CIS should it is offered in the market. To achieve the general objective, the specific objectives are:

1. To determine the attributes for a proposed CIS
2. To determine the degree of importance among the attribute concerns
3. To measure the WTP for the CIS among farmers in the affected areas.

In achieving our objectives, the study employs the economics valuation technique specifically the Choice Experiments (CE).

2. Choice Experiments

CE is a technique where respondents are required to choose the most preferred alternative from a series of alternatives presented to them Bateman *et al.* (2002). These alternatives refer to various hypothetical scenarios that portray the CIS understudy. These alternatives usually consist of possible combinations of various attributes and in order to portray a wide range of scenarios, different levels of attributes are employed. An underpinning theory in CEs explains that the utility derived by consumer in using any good can be derived from the characteristics or attributes of the good (Lancaster, 1966).

The analysis of CEs data traditionally uses the multinomial logit (MNL) model (McFadden, 1974). MNL is the most frequently applied model for parameter estimation in CEs (Adamowicz *et al.*, 1997; Boxall and Adamowicz, 2002; Hanley *et al.*, 2001). The popularity of the model is because it is easy to be estimated compared to other models such as the multinomial probit (Train, 2003).

In this model, an individual faces a choice among *J* alternative CIS in a choice set. The utility that consumer *n* derives from choosing a CIS can be expressed as:

$$U_n = V_n + e_n \qquad \textbf{(1)}$$

Assuming an individual choice is based on the random utility model (RUM) framework, the indirect utility function of U_n can be decomposed into two components, V_n the part that is a function of factors observed by analysts which is known as deterministic element, and e_n the stochastic component (Hanley *et al.*, 2001). The MNL model assumes that individuals have homogenous taste preferences (i.e. where individuals have identical yardsticks when choosing alternatives in the choice cards).

However, the assumption is not always the case in the real world because population consists of different types of individuals, with different characteristics and tastes (or preferences). Taste heterogeneity can be classified into two parts: systematic heterogeneity and random (or stochastic) heterogeneity (Bhat, 1997). Systematic heterogeneity explains variation that happens due to observable individual characteristics. On the other hand, random heterogeneity accommodates the variations due to unobservable individual characteristics.

Systematic heterogeneity can be accommodated in MNL through an interaction between socio-demographic characteristics, and constant terms and/or attribute(s) of the alternatives (Adamowicz *et al.*, 1997; Blamey *et al.*, 2000). The socio-demographic characteristics have to be interacted with constant terms and/or attribute(s) because they do not vary across alternatives. This model is known as MNL with interactions.

Table-1. Attributes and Level for CIS

Attribute	Level	Expected Coefficient Sign
Type of Coverage (COV)	Flood (SQ) flood and plant fell off flood, plant fell off and crop diseases	+
Sum Assured/Benefit (SUM)	RM800.00 (occasional government aid) (SQ) RM3700.00 RM4600.00 RM5500.00	+
Premium Payment (PREM)	RM0.00 (SQ) RM10.00 RM15.00 RM25.00	-

In this study, several attributes in relation to CIS were elicited from several discussions with the insurance market players and farmers as presented in table 1. Although the specific scheme still does not exist, the hypothetical scheme should at least include these attributes since these are the basic attributes that are usually being considered by consumers when deciding to purchase a policy.

3. Past Studies

There are several researches done on estimating WTP among paddy farmers for crop insurance in Malaysia. For instance, Amin (2014), explores the willingness to pay for crop insurance among paddy farmers in the north-west Selangor Integrated Agricultural Development Area (IADA), Malaysia. The study used a different approach called Contingent Valuation Method (CVM). Their results show that the mean willingness to pay of the farmers is RM76.57 per RM1,000 protection coverage per crop season. Rafia *et al.* (2017), also used CVM to estimate WTP among paddy farmers in Muda Agricultural Development Authority (MADA) area in Kedah. Their findings shows that paddy farmers in MADA area in Kedah are willing to pay an average premium of RM48.15 for every RM1,000 coverage per hectares per season. One more study done in Malaysia is by Nurul Asrin (2013), that also estimate WTP among paddy farmers towards crop insurance, but this time the respondents are among paddy farmers in the area of Integrated Agricultural Development Authority (IADA) Ketara, Terengganu. Nurul Asrin Roslan also used the CVM Method to estimate the mean WTP which amounted to an average of RM56.00 for RM1,000 coverage per hectares per season.

From the above studies, it is proven that paddy farmers in Malaysia are willing to pay for crop insurance between RM48 to RM76 per RM1,000 protection coverage per hectares per season. All of the studies used CVM that needs the study to portray a hypothetical situation and the respondents are to understand the hypothetical situation and to respond "yes"or "no" to one bid amount shown to them. The difference with our study is that we are allowed to estimates the marginal WTP between different attributes and different levels.

Adeel Ahmed *et al.* (2015), according to this study, for addressing the climate issues in Pakistan's agricultural sectors, farmers willing to pay for a planned adaptation event. This study has proven that 67% of respondents were ready to pay for a planned adaptation programme. The result of this study will support attempts by policy makers to make an efficient adaptation framework for adapting and justifying to the adverse impacts of climate change.

Rafia *et al.* (2017), the results of the study report that majority of the rice farmers of the study area are medium aged. As expected, 47% of the farmers have secondary school education which will enable them to adapt new methods of rice production. In this study, we also find that 36% of respondents reveal that their monthly earning is in the range of RM 2000 to RM 4000. Their income is above the Malaysia's national poverty line income of MYR 800 (10th Malaysian Plan). The major risks faced by the farmers are rat attack, disease, excess rainfall, high temperatures, variation in yield, and flood. This study reports that most farmers think crop insurance scheme is designed especially for wealthy farmers because it costs high quality and is not available to the poor and marginal farmers. They also perceive that the procedure currently works for another insurance scheme is very complicated.

Nurul *et al.* (2015), this study showed all four dimensions (Attitude, Subjective norms, Perceived behavioral control and Perceived risk) can be used to predict the farmers' intention to participate in Agriculture Takaful. However, the findings also suggest that perceived behavior control and perceived risk are the most significant factors in influencing the farmers' intention to participate in Agriculture Takaful. On the risks faced by the farmers, the findings identified that risks frequently experienced by farmers are pest attacks. However, in terms of severity and economic loss, the risk is again the most severe of risks faced by farmers are pests attack.

Rika and Zainalabidin (2011), this study investigated the actual structure of farm household income from not only the income level but also from income difference among the selected five main granaries in Malaysia. It showed that the granary areas in Penang and Selangor had the highest income households, while Kelantan, Terengganu and Kedah 164 had much lower income households. However, income structures were not the same as the income household levels between the higher and lower income households. For example, even though the level of total household income in Terengganu and Kedah were almost similar on average, the direction of rural development needs to be considered in a different way i.e. in Terengganu for example the off-farm sector such as rubber tapping activities help to increase household income. In the case of Kelantan, the policy needs to leverage the on-farm and off-farm sectors in order to increase their limited household income.

4. Crop Insurance Scheme – The Models

The study involves two stages, namely a survey to elicit responses using the choice sets and the econometric analysis to estimate a utility model, whereby the WTP estimates are derived. The model consisted of the dependent variable and the independent variables consisted of several selected attributes at different levels. The model is presented below in equation (2).

$$\text{Model 1: } V = \ ⌾_1 COV + ⌾_2 SUM + ⌾_3 PREM \qquad (2)$$

The model coefficients $⌾_i$ represent the relative importance attached to each attribute in determining a respondent's ranking. Strictly speaking, they can be interpreted as the marginal utility/disutility associated with one unit change in any of the attributes as shown below.

$$\delta V/\delta COV = ⌾_1 \qquad (2a)$$

$$\delta V/\delta SUM = ⌾_2 \qquad (2b)$$

$$\delta V/\delta PREM = ⌾_3 \qquad (2c)$$

The WTP for each attribute is defined as the marginal rate of substitution between each attribute and the price variable where:

$$WTP_{COV} = (\delta V/ \delta COV) / (\delta V/ \delta PREM) = - \odot_1 / \odot_3 \quad (3a)$$

$$WTP_{SUM} = (\delta V/ \delta SUM) / (\delta V/ \delta PREM) = - \odot_2 / \odot_3 \quad (3b)$$

A limitation of the main effects models given above is that they do not allow preferences to vary across individuals in accordance with socio-economic characteristics. This can be corrected by interacting the attributes with socio-economic characteristics. According to Greene *et al.* (1989) the individual specific variable must be entered in the utility function in interaction form with attributes that change across the alternatives. A natural interaction to include is the division or multiplication of price by some other variables such as income or in our case, with either the farmers belongs to any plantation scheme or not, SKIM, to obtain a variable which captures price as a proportion of the attribute that we interacted (Garrod and Willis, 1997;1999), and is given in Model 2.

$$\text{Model 2: } V = \odot_1 COV + \odot_2 SUM + \odot_3 PREM + \odot_4 SKIM*PREM \quad (4)$$

$$\delta V/ \delta PREM = \odot_3 + \odot_4 /SKIM \quad (4a)$$

5. Choice Set Formation

Questionnaires containing the CE were designed to collect data from respondents at the identified areas. The choice set for the CE uses the *fractional factorial* design generated using the ORTHPLAN procedure in SPSS. The use of fractional factorial design reduces the number of cases from 48 based on a *full factorial* ($3^1 4^2(L^A)$) design to 9 cases. Not only the numbers of cases were reduced, fractional factorial design also maintained the element of *orthogonality* in the choice set produced, meaning that each variable has no correlation with each other.

The generated cases were paired to form several choice sets and were presented to the respondents together with other demographic and attitudinal questions. Each respondent was asked to answer 4 different choice sets. In every single choice set, respondents were presented with 3 choices of which, the first 2 choices are the cases generated and paired in the experimental design while the third choice is the *status quo* or the *business as usual* option. Every time the respondents were presented with the choice set, they were also asked the reason why they made such decision. An example of a choice set is presented in Table 2.

Table-2. Example of Choice Set Choice Card 4

Choice Card 4

	Policy A	**Policy B**	**Policy C**
Type of Coverage	FLOOD AND PLANT FELL OFF	FLOOD AND PLANT FELL OFF	FLOOD
Sum Assured/Benefit	RM3700.00	RM5500.00	RM800.00
Premium Payment	RM10.00	RM25.00	RM0.00

If you have the choice of buying the CIS, which policy would you buy? Please choose only ONE of the above policies.

Please (/) which attributes influence you when making the choice of buying the CIS policy?			
	Always	Sometimes	Seldom
Type of Coverage			
Sum Assured/Benefit			
Premium Payment			

6. Findings

The respondents for the study were identified using the *Stratified Random Sample*, where the strata were identified using the postal/zip code based on the information provided by *Pos Malaysia Berhad* in the identified areas of the district of Kota Setar, Pendang and KubangPasu in Kedah. A total of 139 respondents were survey from these three districts. Respondent's profiles are presented in Table 3.

Table-3. Respondents' Profiles

Category	Frequency	Percentage
Age (years):		
40 and below	28	20
41 – 60	79	56.8
61 and above	32	23
Gender:		
Male	16	11.5
Female	123	88.5
Marital Status:		
Single	13	9.4
Married	119	85.6
Single Parent/ Divorcee	7	5
Education Level:		
Primary school and below	33	23.7
PMR	33.1	33.1
SPM	34.5	34.5
STPM and above	12	8.7
Experience as paddy farmers:		
10 years and below	28	20.1
11 – 20 years	30	21.6
21- 30 years	51	36.7
31 and above	30	21.6
Farm ownership:		
Owner	74	53.2
Rental/Lease	65	46.8
Size of farm (*relong):**		
5 and below	25	18
6 -10	64	46
11-15	27	19.4
16 and above	23	16.5
Involve in some other job/occupaption	66	47.5
Belongs to Local Farmers' Organization	108	77.7
Experiencing Flood	123	88.5
***Local measurement: 1 *relong* = 0.7 acre = 0.2835 hectare**		

Generally our respondents consist of middle age married females with an average of secondary level of education background. About 80 percent of them have more than 10 years of experience in paddy plantation. Although most of the respondents owned the paddy fields (53.2%) the size of ownership usually small, where more than 60 percent of them with size of farm 10 *relong*(approximately 2.88 hectares) or less. It is interesting to note that most of them belong to local farmers' organization (77.7%) and most of them are at risk from the natural disasters which is flood (88.5%).

Table-4. CE Basic and Interaction Models

	Basic Model		Interaction Model	
Attribute	**Coefficient**	**Implicit Price**	**Coefficient**	**Implicit Price**
COV1	**1.3017*** (0.1667)**	**67.11**	**1.3086*** (0.1672)**	**38.31**
COV2	**2.4950*** (0.2346)**	**128.63**	**2.5044*** (0.2371)**	**73.32**
SUM1	**0.6534*** (0.1755)**	**33.69**	**0.6632*** (0.1761)**	**19.42**
SUM2	**0.9489*** (0.1533)**	**48.92**	**0.9627*** (0.1540)**	**28.19**
SUM3	**1.0421*** (0.2179)**	**53.73**	**1.0444*** (0.2186)**	**30.58**
PREM	**-0.0193* (0.0106)**	**-**	**-0.0927*** (0.0339)**	**-**
SKIM*PREM			**0.0761**(0.0334)**	
Summary Statistics				
Log-likelihood function: $L(\beta)$	**-462.2945**		**-459.7337**	
Log-likelihood: $L(0)$	**-521.6533**		**-521.6533**	
Psuedo-R^2	**0.11379**		**0.1187**	
Adjusted Psuedo-R^2	**0.10898**		**0.1131**	
Chi-squared	**6.42774**		**12.5966**	
Number of observations	**556**		**556**	

***significant at 1%, ** significant at 5%, and *significant at 10%; std. errors are in brackets

The estimated coefficients and implicit prices for basic MNL and the MNL with interactions models are presented in Table 4. The explanatory powers for both models are considered good with their adjusted psuedo-R2 of 11%. The estimated results show that all attributes are significant at least at 10% in both models and have the a priori expected signs. The results also confirm to the axioms of choice: non-satiation when the coefficient values for attribute at higher level are greater than the coefficient values for attribute at lower level. For instance, the attribute of coverage at higher level (COV2) in the basic MNL is greater than the attribute at medium level.

The estimated interactions variable (Skim*Prem) was significant at 5%. The results for interactions with the prices attribute show that the estimated coefficient for respondents who participated in the scheme is greater than the estimated coefficient for those who do not. If translated into the WTP estimates, however, the results suggest a respondent who participated in the scheme is willing to pay less compared to their counterpart.

The implicit price for each attribute was calculated as the ratio of coefficients for the attribute (or level) with the cost parameter using the Wald procedure (Delta method) in Limdep 8.0. The implicit price measures the respondents' willingness to pay. For instance, the implicit price for attribute COV1 in basic CL model means that respondents are willing to pay an extra of RM67.11 to obtain an improvement to the attribute from the basic to medium level. Rationally farmers are more than willing to pay for additional benefits in reducing the risk of crops failure as compared to the RM800 they received currently from the aid program given by the government.The result is also consistence with findings from past research as mentioned above.

7. Conclusion

The main purpose of this paper was to apply the use of CE in valuing farmers' WTP for a potential crop insurance scheme to be proposed in Malaysia. In doing so, three most important attributes were identified namely *the coverage, the sum assured* and *the premium price* of the policy. The study found that the potential of introducing such scheme is possible based on the WTP provided by farmers. Furthermore, based on the results found in both models presented above, *the coverage* elements are crucial and important relative to *the sum assured* element, as given by higher Marginal WTP, which also indicated the degree in the relative importance among the attribute concern in a scheme. Therefore in designing a suitable CIS policy, both the government and the insurance providers should give an extra emphasize on these attributes in order to come up with an attractive insurance scheme. The potential of the CIS cannot be denied since there is a huge market for such scheme. Besides, it will reduce the dependency to government aid and open the new market horizon in risk management.

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References

Adamowicz, W., Swait, J., Boxall, P., Louviere, J. and Williams, M. (1997). Perceptions versus objective measures of environmental quality in combined revealed and stated preference models of environmental valuation. *Journal of Environmental Economics and Management*, 32(1): 65-84.

Adeel Ahmed, Muhammad Mehedi, M., Abul Quasem, A.-A., Siti Rohani, B. Y., Mahfuzur, R. and Rulia, A. (2015). Exploring factors influencing farmers' willingness to pay (WTP) for a planned adaptation programme to address climatic issues in agricultural sectors. *Environmental Science and Pollution Research*, 22(12): 9494-504.

Amin, M. A. (2014). Farmers willingness to pay for crop insurance in North West Selangor Integrated agricultural development area (IADA), Malaysia. *J. Issaas*, 20(2): 19-30.

Bateman, I., Carson, R. T., Day, B., Hanemann, M., Hanley, N. and Hett, T. (2002). *Economic valuation with stated preference techniques.* Edward Elgar: Cheltenham, Uk and Northampton, MA, USA.

Bhat, C. R. (1997). Endogenous segmentation mode choice model with an application to intercity travel. *Transportation Science*, 31(1): 34-48.

Blamey, R. K., Bennett, J. W., Louviere, J. J., Morrison, M. D. and Rolfe, J. (2000). A test of policy labels in environmental choice modelling studies. *Ecological Economics*, 32(2): 269-86.

Boxall, P. C. and Adamowicz, W. L. (2002). Understanding heterogenous preferences in random utility models: A latent class approach. *Environ. Res. Econ.*, 23(4): 441-46.

Garrod and Willis (1997). The non-use benefit of enhancing forest biodiversity: A contingent ranking study. *Ecological Economics*, 21(1): 45-61.

Garrod and Willis (1999). *Economic valuation of the environment: Methods and case studies.* Edward Elgar: Cheltenham, U.K.:

Greene, J. C., Caracelli, V. J. and Graham, W. F. (1989). Toward a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis*, 11(3): 255-74.

Hanley, N., Mourato, S. and Wright, R. E. (2001). Choice modelling approaches: A superior alternatives for environmental valuation? *Journal of Economic Surveys*, 15(3): 435-62.

Lancaster, K. J. (1966). A new approach to consumer theory. *The Journal of Political Economy*, 74(2): 132-57.

Majlis Keselamatan Negara (2009). *Maklumat kejadian banjir yang berlaku pada tahun 2005-2007 Majlis Keselamatan Negara.* Jabatan Perdana Menteri: Putrajaya.

McFadden, D. (1974). *Conditional logit analysis of qualitative choice behaviour. In P. Zarembka (ed.) Frontiers in econometrics.* Academic Press: New York.

Nurul, A. B. A. A., Noreen Noor, B. A. A., Yon Bahiah, W. A. and Nurul Ashykin, B. A. A. (2015). Factors influencing the paddy farmers' intention to participate in agriculture takaful. *Procedia Economics and Finance*, 31: 237-42.

Nurul Asrin, R. (2013). *Farmers' attitudes towards risk and their willingness to pay for crop insurance in Ketara, Terengganu, Malaysia (Unpublished master thesis).* Universiti Putra Malaysia: Malaysia.

Office of the Prime Minister (2013). Available: https://www.pmo.gov.my/dokumenattached/bajet2013/SPEECH_BUDGET_2013_28092012_E.pdf

Rafia, A., Rulia, A. and Puteri, F. (2017). Willingness to pay for crop insurance to adapt flood risk by Malaysian farmers: An empirical investigation of Kedah. *International Journal of Economics and Financial Issues*, 7(4): 1-9.

Rika, T. and Zainalabidin, M., 2011. "Household income structure among paddy farmers in the granary areas of Malaysia." In *International Conference on Innovation, Management and Service IPEDR.* pp. 160-65.

Train, K. (2003). *Discrete choice methods with simulation.* Cambridge University Press: Cambridge.