Can Protection Motivation Theory Predict Consumer’s Behavioural Intention Toward the Choice of Certified Sustainable Palm Oil in Klang Valley Malaysia?

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Abstract. Encouraging consumers to participate in the promotion of sustainably certified palm oil production and consumption, may require their support towards the supply value chain mechanism. Value chain mechanism are often adopted to promote sustainability and assure the consumers and protect the environment from threat associated with palm oil. We applied Protection motivation theory in this research, and analyse through many set of its indicators to serve as a valuable framework to explain pro-environmental choice. There is dearth of empirical research that test the Protection Motivation Theory on the risk of unsustainable oil palm and its consequences. We equally adopted Structural Equation Model approach, and surveyed 332 consumers in Klang Valley Malaysia. And finally we access the perception of the consumers towards exposure to environmental threat caused by uncertified oil palm production, and coping strategy they adopt to minimize the threat. Though, consumers did not perceived high threat from the uncertified oil palm production, because they trust their perceived self-efficacy and response efficacy to cope up with the consequences of uncertified oil palms. However, even though they indicates, absence of institutional arrangement such as RSPO can expose them to threat of uncertified oil palm, but they perceive the coping strategy adopted by Roundtable on Sustainable Palm Oil (RSPO) was not adequately effectively to ensure compliance with RSPO principles, that would not address the problems associated with uncertified oil palms.

1. Introduction
Mitigating environmental threat requires not only institutional policy but individual behavioural change. This lead us to ask what really are the motivational factors that stimulates people to switch to pro-environmental behaviour? [1]. To achieve this require consumer behavioural change which is very essential in ensuring sustainable future. This study we determined environmental risk such as biodiversity loss and harmful CO₂ emission as a result of uncertified oil palms. Such practices may prompt consumers to adopt coping strategy, by resorting to behavioural intention to choose Certified Sustainable Palm oil. Most of the problems associated with palm can be addressed through its supply value chain mechanism and certification processes, by which agencies such as Roundtable on...
Sustainable Palm Oil RSPO and Malaysian Sustainable Palm Oil MSPO were established to address such problems. Unregulated oil palm expansion can lead to deforestation, displacement of indigenous people, loss of biodiversity, emission of harmful carbon dioxide (CO₂), child labour and exploitation of labour, pollution of air, water and land resources among others.

Environmental psychologist have propounded many theories to explain actions that reduces environmental risks [1]. Even though, psycho-social behaviours and attitudinal study on consumer knowledge and opinion on the products that threatened natural forest and environment are scarce [3], but notable among them that explain the environmental risk, are the theory of planned behaviour [4], Norm activation model [5], value-belief-norm theory of environmentalism [6] and Protection Motivation Theory PMT [7] which is used in this study. PMT was initially developed to predict individual behaviour with regard to personal health treat, though seldom applied to predicts environmental risk or threat however, we belief it can offer some purview to predicts consumers behavioural intention by resorting to protection motivation through their choice environmentally friendly products. The theory consider the efficacy of collective action by consumers or agency (response efficacy) which is also part of norm activation model and value-belief-norm theory. Empirical literature suggest that PMT was successfully applied to areas in broad disipline, such as natural resources, technological hazards, health risk and environmental threats.

The objective of this study is to investigate consumer’s perceived threat and coping appraisal strategies towards their choice of Certified Sustainable Palm Oil (CSPO), which will serve as catalyst towards sustainabilit and certification of palm oil. According to Inanova et al. [8] there is dearth of research on Consumer trust in sustainability certifications.

1.1 The protection motivation theory and the consumer choice of CSPO
PMT is a social cognitive model which was developed and used widely to predict people’s intention to engage in protective behaviors. According to Rogers and Mewborn [7] the theory was formulated on the premise that man’s behavior depends on two correlated pathways; Threat Appraisal Process (TAP) and Coping Appraisal Process (CAP). He further elaborate that when people encounter environmental threat, they naturally activates their threat and coping appraisal process. Threat appraisal evaluates person’s possible involvement with the risk or threat. For instance, the perceived susceptibility to the threat from uncertified palm oil is referred to (vulnerability) and the extent of severe consequences from such threat is (severity). Coping appraisal on the other hand, can be explained as a consumer’s perception that adopting a certain behaviour can remove or mitigate the threat, coping appraisal concepts is succinctly subdivided into self-efficacy and response efficacy. The theory can be applied to explain the environmental threat or hazard protective behaviours, in an attempt to deal with acute risks that may happen suddenly like avalanche, flood, earthquake, volcanic eruption or tsunami. Also chronic or on-set risk that occur slowly and surreptitiously like desert encroachment, deforestation or increase in CO₂ emission, climate change, biodiversity loss, happens as a results of numerous but often connected events. [1].

1.1.1 Theoretical Background and the Development of hypothesis.
PMT was based on two cardinal approaches, TAP and CAP. The two approaches were later divided into perceived severity and perceived vulnerability under TAP and self-efficacy and response efficacy under CAP. We included TAP and CAP variable and relates it to RSPO particularly to examine the theory’s applicability in relation to consumer’s perception of RSPO.
Based on the Figure 1 PMT framework above and some input deduce from some previous studies, we propose the following hypotheses.

\( H_1 \): A consumer who perceives greater severity towards uncertified oil palm will demonstrate more Protection Motivation towards certified sustainable palm oil.

\( H_2 \): A consumer who perceives greater vulnerability towards uncertified oil palm will demonstrate more protection motivation towards certified sustainable palm oil.

\( H_3 \): A consumer who perceives higher response efficacy towards uncertified oil palm will demonstrate more protection motivation towards certified sustainable palm oil.

\( H_4 \): A consumer who perceives higher self-efficacy towards uncertified oil palm will demonstrate more protection motivation towards certified sustainable palm oil.

1.2 Perceived threat from non-certified oil palm
Consumers overall welfare can be threatened severely by compromise in environmental quality, as such certification body such as RSPO which has global outreach can play a significant role in promoting CSPO production and consumption. Consumers often trust the certifying authority, in an event the eco-label and certificate cannot guarantee the authenticity of the producers claim. Consumers can rely on trace and track as an effective mechanism to ensure the quality product (certified) [10]. Eco-labels or Certificates can be used to differentiate between the seemingly homogeneous quality products. Palm oil has a credence attribute in that, the product can only be differentiated by the eco-label. Thus, we propose this hypothesis.

\( H_5 \): A consumer who perceives greater threat from noncertified oil palms will demonstrate less protection motivation towards certified sustainable palm oil

1.3 Perceived potential efficacy of RSPO
RSPO has standards that makes the entire palm oil products value chain more sustainable [11], through some provision of principles and criterion that governs the palm oil production. They equally have enforceable penalty and liability on defaulting members for non-compliance. However, because of its voluntary membership, RSPO has legal limited capacity, and jurisdiction to effectively impose stringent penalty and sanctions on non-members and even some defaulting members. Thus, we proposed that.
H6: A consumer who perceived that oil palm defaulters of RSPO principles should accept liability and heavy penalty, will demonstrate more protection motivation towards certified sustainable palm oil.

1.4 Consumer protection motivation and behavioural intention

Behavioural intention is a belief that an individual has in a statement that indicates a strong intention to act in line with a particular behaviour [9], it is the deciding factor in actual behaviour [12]. PMT theorised that consumer protection motivation [13] can lead them to adaptive attitude and motivates intention and promotes behavioural change. For this purpose, we proposed a hypothesis that.

H7: A consumer who exhibits protection motivation will demonstrate higher choice of certified sustainable palm oil.

2. Methodology

Structured questionnaire was designed, pretested via pilot study, and improved with an input from the previous literature that applied PMT, and the study adopted Likert scale of five point [17].

2.1 Study area and sample size determination

The research was conducted in Klang Valley Malaysia, because it is one of the most developed area in Malaysia, characterised with urban population growth, rapid urbanisation and proliferation of industrial activities [14]. Eight distinct locations randomly selected and surveyed were Serdang, Putrajaya, Rawang, Kuala Lumpur, Bangi, Charas, Kajang, Gombak. We applied systematic random sampling procedure, consumers were surveyed at public places like malls, restaurants, train, bus stations, and hospitals etc. Apart from the initial random starting point of the survey, subsequent samples were selected at certain sampling interval [18]. From every surveyed location, predetermined number of respondents were selected, to enable us arrived at the total number surveyed. Total sample of 330 respondents were surveyed, out of which 32 were considered adequate to run Structural Equation Model (SEM) [15] and the remaining 8 were rejected as they did not meet the criteria for inclusion.

The research site hosts a population of more than 4 million currently, and expected to reach to 7 million by the year 2020 [14], and the required population size based on [16] formula, sample size for the survey is 384 at 95% confidence level for every population of more than 1 million.

3. Data Analysis and Presentation of Results

Hair et al 2010, recommended that if any 3 or 4 of the fitness indexes are within the threshold, the model can be considered fit, and hence further analysis can be supported. We can continue with the analysis of the models. Confirmatory factor analysis, measurement model, and structural model fitness indexes extracted are according to [20; 15], where Relative chi-square ≤ 5.0, RMSEA ≤ 0.8, CFI ≥ 0.9, TLI ≥ 0.9 which is reflected in Table 1 below.

| Name of the category | Name of the fitness indexes | Measurement model | Structural model | Decision |
|----------------------|-----------------------------|-------------------|------------------|----------|
| Absolute fitness     | Chi-square value Root Mean Square Error of Approximation RMSEA ≤ 0.67 | 124.939 | 1332.194 | Achieved |
| Incremental fitness  | Comparative fit index CFI ≥ 9 Tucker Lewis Index TLI ≥ 9 | 918 | 914 | Achieved |
| Parsimonious Index    |                             | 907 | 903 |          |
### 3.1 Structural Equation Model Analysis of Consumer’s Protection Motivation Decision

Data for this study was analysed using software, to investigate palm oil consumers’ Protection motivation towards behavioural intention to choose CSPO. The Table 2 shows a matrix of bivariate correlation between the variables of protection motivation, for both the dependent variable and independent variables, 0.5 is the threshold value of the coefficient, and most of our correlation values falls below the threshold, which means there is no strong overlapping among the variables. In the same vein, the bivariate correlation is not beyond the critical value of 0.75 threshold, which means there is no problem of multicollinearity [15].

**Table 2. Correlation matrix of the variables**

| CR | AVE | VL | SR | BI | RE | SE | TAP | PM | CAP |
|----|-----|----|----|----|----|----|-----|----|-----|
| VL | 0.904 | 0.703 | **0.723** |    |    |    |    |    |    |
| SR | 0.895 | 0.682 | 0.020 | **0.899** |    |    |    |    |    |
| BI | 0.920 | 0.697 | 0.462 | -0.162 | **0.790** |    |    |    |    |
| RE | 0.813 | 0.522 | 0.591 | -0.089 | 0.534 | **0.797** |    |    |    |
| SE | 0.897 | 0.636 | 0.470 | -0.146 | 0.579 | 0.655 | **0.832** |    |    |
| TAP | 0.918 | 0.692 | 0.565 | -0.165 | 0.498 | 0.578 | 0.551 | **0.825** |    |
| PM | 0.868 | 0.624 | 0.378 | -0.086 | 0.599 | 0.559 | 0.534 | 0.519 | **0.841** |
| CAP | 0.873 | 0.775 | 0.406 | -0.006 | 0.379 | 0.515 | 0.357 | 0.512 | 0.419 | **0.835** |

**Note:** the square root of AVE is diagonal and written bold while off diagonal is the correlation between two constructs. Result of the individual constructs CFA has achieved the validity indices namely constructs, convergent and discriminant validity. SEM result in Table 3 PMT hypothesized path model, included an extension of RSPO (CAP and TAP) constructs as the secondary variables of PMT. Severity, Vulnerability, Self-efficacy and Response efficacy as primary variable, stand as endogenous variables, while protection motivation and behavioural intention are the indigenous variables.

**Table 3. Hypothesised Regression Weight for Protection Motivation in predicting Behavioural Intention**

| Protection Motivation | Behavioural intention | $\beta$ | S.E | C.R | P  | Decision  |
|-----------------------|-----------------------|--------|-----|----|----|-----------|
| RSPO Threat Appraisal |                      | .303   | .096| 3.160 | 0.002 | Significant |
| RSPO Coping appraisal |                      | .080   | .054| 1.470 | 0.142 | Not significant |
| Severity              | - .003               | .025   | -.112 | .911 |    | Not significant |
| Vulnerability         | - .057               | .071   | -.806 | .420 |    | Not significant |
| Response efficacy     | .293                 | .086   | 3.405 | 0.000 |    | Significant |
| Self-efficacy         | .226                 | .067   | 3.392 | 0.000 |    | Significant |
| - Protection motivation | .580               | .062   | 9.395 | 0.000 |    | Significant |

$\beta$ = standardized regression weight; S.E = Standard error; C.R = Critical ration of the regression weight; P = level of significance

4. Discussion and Conclusion
We explain our hypothesis based on the research framework and presents our discussion. Our finding indicates that significant coefficient of RSPO (TAP) hypothesis 5, implies consumer perception of the of the higher threat appraisal based on their trust that the certification and eco-labelling of palm oil, that the RSPO supply value chain model can address the problems associated with unsustainable oil palm, because this will enhance their protection motivation. Consumers felt vulnerable and severely threatened in the absence of institutional arrangement such as RSPO which will address the problem associated with oil palm. On the other hand, insignificant coefficient of hypothesis 6. Implies consumer’s perception of the coping appraisal adopted by RSPO to address the problems associated with palm oil, shows consumers lower degree of acceptance. In this case RSPO needs to do more to earn the trust of consumers, through education and campaigns. When consumers have higher perception of RSPO coping strategy they will demonstrate higher degree of protection motivation, this will eventually lead to positive behavioural intention by choosing to patronize CSPO.

Our finding indicates that consumers have lower perception of severity and vulnerability threat individual. In this sense, the consumers not felt highly vulnerable and severely threatened with respect to uncertified oil palm processes. This implies hypothesis 1 and 2, the consumer’s exhibits lower perception of the connection between uncertified oil palm and the loss of biodiversity, high emission of CO₂, and such low awareness of certified palm oil can lead to the choice of uncertified palm oil. Hence, the consumer threat appraisal did not support their higher perception will eventually enhance their protection motivation.

To overcome the problems associated with noncertified palm oil, consumers must believe that they have the capacity to make a strategic behavioural change through knowledge and awareness. Government and other relevant agencies on the other hand, should mount campaign to enlighten general public on the benefits of patronising certified palm oil. Coefficient of hypothesis 3 and 4 predicts the consumer intention, to practice protection motivation decision by choosing CSPO cooking oil. This is obtained by significant level of their behavioural intention in hypothesis 6 and 7 to choose RSPO certified cooking oil, in a nutshell our finding is in line with Giam et al. [3] on the consumer’s willingness to pay price premium for products containing CSPO, also [19] consumer’s preparedness to support Reducing Emissions from Deforestation and Forest Degradation (REDD) mechanism to minimise deforestation by certifying all wood products sourced from tropical forest. In the same vein, our finding indicates consumer’s preparedness to support RSPO to conserve biodiversity and minimise CO₂ emission, which will allay their perceived threats and activates their coping strategy, to address the effect of uncertified oil palm and unsustainable palm oil consumption.

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