Willingness to Pay for Sustainable Coffee: A Case of Thai Consumers

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Introduction

Recently, sustainable consumption has been suggested worldwide as an alternative solution for the environmental issues (Lentijo & Hostetler, 2020; Takahashi et al., 2018) as well as ethical issues (Gallenti et al., 2016; O’Connor et al., 2017). There are prominent environmental issues which related to climate change that severely affect our planet, for example, wildfire in Europe between 2010 and 2017 (Faivre et al., 2018), and the biggest forest fire in Australia during 2019 to 2020 (Gramling, 2020). Climate change is reported as the direct causes of these disasters through the favorable weather condition triggering the ignition and propagation of the fire (Faivre et al., 2018; Gramling, 2020). Along with it, consumers are aware that their buying behaviors might impose direct or indirect adverse impacts on the environment, accordingly they are justifying their consumption behaviors by acquiring and adopting environmentally friendly products and services. As a consequence, the rising sustainable or green consumerism, which involves the production, promotion, and advancement of the utilization or use of goods and services based on their pro-environment benefits (Akenji, 2014), has considerably affected environmentally conscious decisions for various businesses by modifying their manufacturing and operation practices (D’Souza & Taghian, 2005; Wolfe & Shanklin, 2001). Herein sustainable coffee label certainly fits into the notion of sustainable consumerism.

The common missions of various sustainable coffee labels currently in the market place can be identified in two aspects, one is addressed on the environmental conservation, and the other emphasizes on ethical issues. In the environmental aspect, the goals are to promote the balance between natural ecosystem and coffee farming activities, protect wildlife, avoid deforestation, while leave the environment the least intact (Giovannucci & Ponte, 2005; Lentijo & Hostetler, 2020). Regarding the ethical aspect, the aims are to decrease poverty by improving farmer livelihood in developing countries where most sustainable coffee farms are located; and enhancing social equity among farmers and workers (Giovannucci & Ponte, 2005). Farmers receive fair coffee price through the premium while workers receive fair wages under safe working condition (Maaya et al., 2018; Rotaris & Danielis, 2011). On the other hand, to consumers, it provides not only physiological benefits such as food safety and health advantage, but also psychological satisfaction to ethically and environmentally consciousness consumers (Liu et al., 2019; Voora et al., 2020). Yet, among all the current available

Abstract

The aim of this study is to investigate the willingness to pay (WTP) for sustainable coffee, and its determinants as well. Drawing an empirical survey with 500 consumers in Thailand, contingent valuation method was performed to elicit the WTP for sustainable coffee. A logistic model was adapted to evaluate the impacts of factors under Fishbein and Ajzen’s theory of reasoned action, that is, to test hypotheses of attitude and subjective norm, along with consumer characteristics on the WTP. Stata15 was adopted to analyze the cross-sectional data in logistic models; meanwhile probit regression was performed to confirm the results of the logistic model. The results indicate that attitude, self-brewing, marital status, past experience, job, and household income influence WTP. The WTP or premium price of sustainable coffee as compared to the conventional coffee is found to be 36.48%. Various stakeholders in coffee industry, for example, distributors, roasters, retailers and coffee farmers, as well as the policy makers, can act accordingly based upon the findings to develop a sustainable value-added coffee supply chain.

Keywords

WTP, sustainable coffee, contingent valuation method, logistic model, theory of reasoned action
sustainable coffee labels, there exist some degrees of differences in terms of practices in production and management.

Sustainable value regarding coffee is referred to consumers when making their purchasing decisions related to certification labels that reflect the sustainability characteristics of such coffee products and on the assumption that consumers value the label (Bray & Neilson, 2017; Maciejewski et al., 2019). That is, sustainable value is derived from sustainable consumption, which is in agreement with SDG #12 (UN, 2020). The most salient advantage of UTZ is traceability (Lentijo & Hostetler, 2020). Rainforest Alliance is aligned with SDG #4 (UN, 2020) as its goal is to promote equal access to education (UN, 2020). Its aims include planting shade tree and requiring farmers to treat workers with respect by providing medical care, decent wage, safe working condition, and access to education (Lentijo & Hostetler, 2020). UTZ has merged with Rainforest Alliance since early 2018, and holds strong determination to handle environmental and social challenges, that is, climate change, deforestation, rural poverty, and unsustainable farming practices (Newsom & Milder, 2018), which further comply with more SDGs, that is, #1, #12, and #13 (UN, 2020). Finally, Fair Trade is concerned with human right, prohibits child labor on farm and restricts the use of chemicals. It encourages farmers to produce coffee under the cooperatives and set a guarantee price for farmers as part of its commitment to reduce poverty (Haimmueller et al., 2015; O’Connor et al., 2017), which is in harmony with the SDG #1 and #12 (UN, 2020). In summary, all certification programs are commonly consistent with SDG #12, that is, to ensure responsible consumption and sustainable production patterns (UN, 2020).

In Thailand, conventionally produced coffee is for the primary consumption. However, drinking coffee has been changed, it is not only for freshness but also to convey personal lifestyle and taste (Bank of Thailand, 2021). In 2018, the coffee business and coffee shops expanded by 37.7% compared to 2017. By 2021, away from home coffee spending will reach 80.7% (e.g., in bars and restaurants), while at home coffee consumption will have a share of 19.3% (Statista, 2021). According to the global trend, Thai consumers are entering the third wave where the specialty coffee plays an outstanding role with a 3% to 5% annual growth (Bank of Thailand, 2021). Its distinctive feature is related to certifications (Sepúlveda et al., 2016) and sustainable production (International Trade Centre, 2020). More emphasis is placed on the geographic area and flavor profile of the coffee origin (Grabs et al., 2016). It can be claimed that there is a growing opportunity for sustainable coffee consumption.

In this regard, the current coffee production in Thailand mainly focuses on primary processing to procure green coffee beans to supply to intermediaries (Department of Trade Negotiations, 2021). Most Thai coffee farmers are small-scale and price takers who face a variety of challenges (Angkasith, 2001; Pongthong & Masahiro, 2014). In the world market, the amount of Thai coffee beans is negligible compared to the major producers such as Brazil and Vietnam (International Coffee Organization, 2021). Coffee production costs in Thailand are higher, while the selling prices are not different from the world prices (Bank of Thailand, 2021; Department of Trade Negotiations, 2021). The dominant players, that is, the roasters and retailers, gain the most of the added value, whereas primary coffee growers are living in poverty (International Trade Centre, 2020). During 2015 to 2019, average income from selling raw or green coffee beans per kilogram was THB70 (THB1 = $US0.033), while the average cost of production was THB61. As such, farmers earned a meager THB9 per kilogram on average. Thai coffee farmers also face rivalry from international competitors as domestic entrepreneurs normally buy cheaper imported green coffee beans (Department of Trade Negotiations, 2021). Recently, the coffee growing areas have declined for a number of reasons, for example, price fluctuation, long-term low profit, and urbanization (International Coffee Organization, 2021; International Trade Centre, 2020). According to Department of Trade Negotiations (2021), during the time period of 2015 to 2019, coffee fields fell from 251,433 to 230,027 rai (1 rai = 0.16 ha); and coffee bean yields dropped from 26,089 to 24,614 tons, resulting in large volume of imported coffee beans to satisfy the domestic demand. Therefore, the idea that increasing sale volumes by expanding coffee growing area is not a feasible solution for the time being. To respond to the third-wave demand of Thai coffee consumption, promoting sustainable coffee not only match consumers’ expectations, but also support the growth of future consumption. On the other hand, the adoption of VSS, would enhance Thai coffee farmers’ competitiveness and improve their livelihood accordingly.

The aim of this study is to investigate the willingness to pay for sustainable coffee, and its determinants as well. Once the determinants of WTP toward sustainable coffee are unveiled, reinforced by the estimated price premium, or WTP for sustainable coffee, various stakeholders in coffee industry can act accordingly to develop a sustainable value-added supply chain.

Literature Review and Hypotheses

Development

Theory of Reasoned Action

According to the theory of reasoned action (TRA) by Fishbein and Ajzen (1975), human action is influenced by
two major factors, “attitude” and “subjective norm.” Attitude means “the general feelings of a person regarding a favorable or unfavorable evaluation about stimulus object.” Subjective norms are “individuals’ perception about people who are important to them think they should or should not perform the behavior in question.” The more favorable the attitude and subjective norms, the stronger should be the person’s intention to perform the behavior of interest (Ajzen et al., 2004; Fishbein & Ajzen, 1975). Attitude exerts positive behavior intention, is strongly supported by the extant literature (Armitage & Conner, 2001; Halder et al., 2016; Hultman et al., 2015; Maichum et al., 2016; Tsen et al., 2006; Yazdanpanah & Forouzani, 2015). As well as subjective norms are found to be a key predictor of behavior intention in previous literature (Liobikienė et al., 2016; Maichum et al., 2016; Meleddu & Pulina, 2016; Yadav & Pathak, 2016).

Contingent Valuation Method

Stated preference (SP) methods are used to elicit an individual’s preferences for alternative goods or service, expressed in a survey context (Stephens, 2010). Interest in applying SP theory and methods has grown significantly in the fields of agricultural and food economics, environmental and resource economics, and health economics since the mid-1990s (Louviere et al., 2010; Yang et al., 2012). The main categories are contingent valuation methods (CVM) and choice modeling techniques (CM). CVM has been widely used to value environmental resources and total benefits of a package of products, while choice modeling (CM) was initially used in marketing and transport literature by Louviere and Hensher (1982), and Louviere and Woodworth (1983); and later has been used in estimating the value of recreational and environmental goods in terms of individual attributes (Mogas et al., 2002).

Pathway toward the adoption of sustainable standards can be inspired by the growing demand for certified sustainable product (consumer-driven) (Gao et al., 2020; Grabs et al., 2016). The increase demand means the higher premium for farmers (Lentijo & Hostetler, 2020). WTP exerts consumer preferences for non-market goods and is often analyzed through contingent valuation method (CVM) (Smith, 2006), and choice modeling techniques (CM) (Liu et al., 2019; Rotaris & Danielis, 2011; Sepúlveda et al., 2016). In evaluating consumers’ WTP for sustainable coffee in a whole package, the real market evaluation is not feasible due to the constraint that the product is hypothetical in Thailand. Hence, a non-market valuation method such as CVM is more appropriate. In addition, given time and budget constraints, CVM provides a good choice to fulfill researchers’ consideration (Stephens, 2010).

Early CVM studies used single open-ended questions, whereas a framework of dichotomous choice was developed during the 1980s (Loomis et al., 1997). The closed-ended question as a dichotomous choice, when combining the follow-up questions, single-bounded question can become double or even multiple bounded. The double-bounded dichotomous approach benefits a greatly reduction of variance of a mean WTP estimate. Nevertheless, the disadvantage is that there is a tendency to form a starting point bias (Whitehead, 2006). To deal with this bias, Kunituo (2017) randomly topped up the benchmark price of conventional vegetables by 125%, 150%, 175%, or 200% and used as the starting prices to elicit the WTP for certified vegetables in an equal distribution. In addition, there are other types of valuation technique such as polychotomous choice, payment card, and iterative bidding questions. There seems to be no agreement on which type is the most appropriate among researchers (Whitehead, 2006). Notwithstanding, all these mentioned questions are easy to be proceeded via an in-person interview (Whitehead, 2006).

Yang et al. (2012) established the payment card approach to examine Fairtrade coffee consumption in China. Other researchers also applied the payment card method to investigate the determinants of the WTP for three value-added blueberry products (Hu et al., 2011). Kunituo (2017) employed a modified double-bounded dichotomous choice method to explore the WTPs for certified vegetable in Burkina Faso.

Hypotheses Development

In contingent valuation method for accessing WTP, the behavior of interest is expressed by voting “yes” or “no” on willingness to pay more for something in question under hypothetical situations. In attitude-behavior paradigms, attitude is a crucial variable to predict the willingness to pay (Meleddu & Pulina, 2016; Mohamed et al., 2014; Pouta & Rekola, 2001; Rezai et al., 2013; Yi, 2019). Based on Fishbein and Ajzen’s (1975) Theory of Reasoned Action (TRA), individual’s behavior intention is constituted from a function of attitude toward behavior and subjective norms, and in turn the intention is the proximate determinant of behavior. According to CVM reviews; in forest economics, positive attitudes toward supporting the policy raised the odds of yes answers in predicting the WTP for abatement of forest regeneration (Pouta & Rekola, 2001). In ecotourism, attitudes positively influenced consumers to allocate more budget on ecotourism, such as the presence of lakes and the possibility to learn about nature had the strong impact on the highest odds ratios (Meleddu & Pulina, 2016). Yi (2019) used double bounded CVM to predict the WTP for sustainable integrated agriculture-aquaculture rice in South Korea found that attitude significantly influenced consumers’ WTP. In part of green food, Rezai et al. (2013) found that attitudes positively affected the consumers’ WTP. Likewise, Mohamed et al. (2014) conducted CVM by using logistic regression to estimate the determinants of WTP for eco-labeled food products in Malaysia. The results showed that attitude positively affected willingness to pay for eco-labeled food products.
Zhang et al. (2018) found that attitude had positive impact on the consumers’ purchase intention and willingness to pay a premium price for safe vegetables. Thus, the following hypothesis is proposed.

**H1: Attitude affects consumer’s WTP for sustainable coffee.**

In this study, the attitude toward buying sustainable coffee is “attitude toward voting yes” which is traced to a set of beliefs related to buying behavior. In line with the expectancy value model (Feather, 1982; Fishbein, 1963), “attitude toward voting yes” is assumed to be determined by beliefs about the impacts of doing so, each belief weighted by the subjective value of the outcome in question (Fishbein, 1963, 1967; Fishbein & Ajzen, 1975). In this study, a person’s attitude toward purchasing behavior is assumed primarily determined by two salient beliefs regarding sustainable coffee, that is, environmental and ethical beliefs (Fishbein & Ajzen, 1975). In previous literature, the positive behavioral beliefs in environmental and ethical aspects were regarded as crucial determinants to predict attitude toward purchasing organic products (Bai et al., 2019; Pouta & Rekola, 2001; Zagata, 2012). For example, belief in the positive effect of regeneration cutting on forest growth was the most important predictor of regeneration attitude toward the WTP for abatement of forest regeneration (Pouta & Rekola, 2001). Beliefs such as organic food was more environmentally friendly and safer also had the positive impact on consumers’ attitude toward the organic purchase decision (Bai et al., 2019). Zagata (2012) discovered that the correlation coefficients of behavioral beliefs such as organic food were processed without chemical additives, lack chemical residuals, environmentally-friendly produces, support animal welfare, support rural development, taste good, and locally produced were positively significant with attitude toward purchasing organic food. Therefore, hypotheses H2 and H3 are postulated.

**H2: Environmental belief affects attitude toward the WTP for sustainable coffee.**

**H3: Ethical belief affects attitude toward the WTP for sustainable coffee.**

Subjective norms are individuals’ s perception about people who are important to them think they should or should not perform the behavior in question (Fishbein & Ajzen, 1975). In previous CVM literature, social norms positively affected consumers’ WTP for sustainable integrated agriculture-aquaculture rice and fish in South Korea (Yi, 2019). However, Pouta and Rekola (2001) found that subjective norm was not a significant predictor of the WTP; nevertheless, subjective norm was correlated to attitude toward supporting forest regeneration in Finland. According to López-Mosquera et al. (2014), social norms also significantly influenced attitudes, and attitude in turn predicting behavioral intention as well as the WTP for the conservation of an urban park. Similarly, Splash et al. (2009) found that subjective norm positively predicted the WTP for improving biodiversity in a water ecosystem. In addition, subjective norm positively exerted influence on the WTP for improving the waste management (Vassanadumrongdee & Kittipongvises, 2018). Thus, the following hypotheses are proposed.

**H4: Subjective norm is influenced on consumer’s WTP for sustainable coffee.**

**H5: Subjective norm affects attitude toward the WTP for sustainable coffee.**

In this study, other than attitude and subjective norms under the TRA model, consumers’ characteristics consist of sociodemographics and characteristics related to coffee consumption, are proposed to influence WTP. According to literature, consumer characteristics such as knowledge of products (Cerjak et al., 2015; Pedregal & Ozcaglar-Toulouse, 2011; Saleem & Recker, 2014), past experience (Mohamed et al., 2014; Saleem & Recker, 2014), and demographic variables (Evanschitzky & Wunderlich, 2006; Keaveney & Parthasarathy, 2001; Meleddu & Pulina, 2016; Rotaris & Danielis, 2011; Samoggia & Riedel, 2018) supported the decision making toward the purchase of product or service in question. According to CVM literature, household income positively affected the WTP, whereas age negatively influenced the WTP for sustainable integrated agriculture-aquaculture rice in South Korea (Yi, 2019). Others found that income had a major role to drive consumers’ WTP for certified fruits (Wang & Huo, 2016), green foods (Rezai et al., 2013), eco-labeled food products (Mohamed et al., 2014), and protecting natural environments (Mamat et al., 2013). In synchronization with these discoveries, Kunituo (2017) also found that fulltime employees (i.e., salary workers) who earned regular source of income were more willing to pay for certified vegetable than other occupational groups. Yang et al. (2012) examined Fairtrade coffee consumption in China, and found that female consumers, self-brewing individuals, and those who planned to consume more coffee in the following year were willing to pay a premium price. Moreover, consumers’ WTP also depended on education (Adamu et al., 2015; Bhattacharai, 2019; Kunituo, 2017; Mamat et al., 2013). Bhattacharai (2019) uncovered that household size affected WTP for organic vegetables in Nepal. Similarly, gender was found to influence consumers’ WTP for the reserve conservation (Adamu et al., 2015) and green foods (Rezai et al., 2013). Finally, drinking coffee habits, that is, the type of coffee being consumed or how the coffee was consumed, were implied as the driving factors of consumption (Samoggia & Riedel, 2018). Therefore, the following hypothesis is postulated.
**H6:** Consumer characteristics which consists of coffee knowledge, past experience, age, gender, education, marital status, job, household size, household income, and drinking coffee habits affect consumer’s WTP for sustainable coffee.

Figure 1 shows the research model of this study. Environmental and ethical beliefs, and subjective norms are assumed to form attitude toward sustainable coffee; attitude toward sustainable coffee, subjective norm, consumer characteristics will exert influence on consumer’s WTP for sustainable coffee.

**Methodology**

**The Sample Size**

For contingent valuation survey, the appropriate sample size for a reasonable balance between robustness of results and cost of conducting is recommended to be 400 (Stephens, 2010). Given that this research employs the logistic regression model, Hair et al. (2019) suggested that the overall sample size should be 400 to achieve best results with maximum likelihood estimation for the logistic regression. However, other scholars suggested the appropriate sample size should be at least 500 to accrue accurate statistics in logistic regression (Bujang et al., 2018). Therefore, the sample size adopted in this study is 600.

**Survey**

A total of 600 survey questionnaires were distributed in Bangkok, Thailand, where is recognized as the nation’s center of politics, economy, finance, and education. The survey was conducted during March to April in 2020. The two-stage sampling method was applied for data collection. In the first stage, the stratified sampling method was employed to select 10 out of 50 districts according to the zoning ratio in Bangkok. Bangkok is divided into three zones, consisting of inner city with 21 districts, urban fringe with 18 districts, and suburb with 11 districts (United Nations Environment Programme, 2001). The lottery method was then used to select four districts of inner city, four districts of urban fringe, and two districts of suburb, which made up ten districts in total. In the second stage, the quota sample size was set to be 60 in each district and purposive sampling method was applied to select the sample.

To decrease sampling bias, surveys were conducted at different places and time during the survey week.
and pens were provided as a token of appreciation for respondents taking part in the survey. In addition, to deal with non-response bias, the questionnaire was designed to be able to complete answering in approximately 15 to 20 minutes. It consisted of four sections. Section I devoted to assess the current coffee purchase and consumption behavior, as well as the past experience of sustainable coffee. Section II designed to measure the constructs of “attitude toward sustainable coffee,” “subjective norm,” “environmental belief,” and “ethical belief.” Thirteen measurement items were proposed and rated on the five-point Likert scale ranged from 1 (strongly disagreed) to 5 (strongly agreed) (Table 4). Section III aimed to elicit the WTP by the contingent valuation method, and explore “coffee knowledge” as well. Section IV devised to collect demographic data such as gender, age, marital status, education, occupation, household size, and income. Two pre-tests were carried out prior to the final survey to improve clarity and reduce hypothetical bias of questionnaire. Out of 600 questionnaires being disseminated, 500 questionnaires were fully responded and coded for the analyses, that is, the response rate is 83.3%.

The product in question of this study is sustainable roast coffee beans in a 250 g-package. The term “sustainable coffee” refers to coffee that is produced following the guidelines of the VSS which set by third-party certification organizations, that is, Fairtrade, USDA organic, EU organic, UTZ, and Rainforest Alliance. The general purpose of these diverse certifications is to promote sustainability in the coffee value chain through improving market fairness, promoting environmental sustainability, and supporting social development of the producers. Any coffee products that have been certified (or verified in some cases) as complying with any of these particular standards are able to use the certification label for marketing and can be sold at the premium price (Bray & Neilson, 2017; Grabs et al., 2016; Lentijo & Hostetler, 2020).

| Table 1. Demographic Characteristics of the Respondents. |
|----------------------------------------------------------|
| Variable | Description of variable | Frequency | Percentage | Mean | SD | Min | Max |
| Gender | Male = 1 | 120 | 24.00 | 0.24 | 0.43 | 0 | 1 |
| | Female = 0 | 380 | 76.00 | | | | |
| Age | Non-senior (18–45 years) = 1 | 391 | 78.20 | 0.78 | 0.41 | 0 | 1 |
| | Senior (46–64 years) = 0 | 109 | 21.80 | | | | |
| Marital status (MS) | Single = 1 | 259 | 51.80 | 0.52 | 0.50 | 0 | 1 |
| | Other = 0 | 241 | 48.20 | | | | |
| Education (EDU) | Master degree and above = 1 | 143 | 28.60 | 0.29 | 0.45 | 0 | 1 |
| | Bachelor degree and lower = 0 | 357 | 71.40 | | | | |
| Occupation (JOB) | Work full-time outside home and student = 1 | 337 | 67.40 | 0.67 | 0.47 | 0 | 1 |
| | Other (retired, self-employed, housewife/husband) = 0 | 163 | 32.60 | | | | |
| Household size (HS) | Big (4 members and above) = 1 | 288 | 57.60 | 0.58 | 0.49 | 0 | 1 |
| | Small (3 members and lower) = 0 | 212 | 42.40 | | | | |
| Household income (HI) | 30,000 THB and above = 1 | 271 | 54.20 | 0.54 | 0.50 | 0 | 1 |
| | Less than 30,000 THB = 0 | 229 | 45.80 | | | | |
| Number of observations | | 500 | | | | | |
small number of respondents have knowledge of sustainable coffee (29.6%), the majority of them (55.4%) indicated yes to the WTP question (#7 in Table 3), that is, that they are willing to pay more for sustainable coffee. On the other hand, out of 352 respondents who have no prior knowledge regarding sustainable coffee, 177 (50.3%) expressed that they are willing to pay more for sustainable coffee.

The 250-g package of sustainable roast coffee beans is now widely available in developed countries, which is compatible in terms of size to the conventional whole bean roast coffee regularly sold in Thailand domestic market. On average, the price of the conventional whole bean roast coffee in 250-g package in Thailand domestic market is THB200. Therefore, the price of THB 200 is designed to be the benchmark price in this study.

Table 3 shows the questions designated to explore the willingness to pay in terms of quantity. In the beginning, the interviewers presented the labels of coffee certifications that were official seals used by Fairtrade, EU organic, USDA organic, Rainforest Alliance, and UTZ and explained that “coffee bearing these labels means that coffee farmers in developing countries around the world have received premium price through selling coffee beans, while workers have received fair wages and worked under safe condition.” After allowing respondents to read the information related to sustainable coffee, the double bounded dichotomous choice questions were adapted to elicit the consumers’ WTP. The respondents were first asked the question: “Would you be willing to pay more for sustainable coffee given the benefits through certification?” (i.e., question #7 in Table 3). If “yes” was ticked, then the respondents were further continuously asked whether they were willing to pay additional 25% or 50% or 75% or 100% to the benchmark price, THB200, to get the first bids until they replied “No.” By scaling up the price against the benchmark price would reduce starting price bias. If the respondent answered “yes” to the first bid, the second bid would be set twice as higher than the first bid. However, if the respondent answered “no” to the first bid, the second bid would be set at half the price of the first bid. The double-bound dichotomous approach considered the answers of the respondents to both bids are driven by the same basic WTP value, such that a second bid can add more information about the respondents’ actual WTP (Alberini, 1995; Whitehead, 2006).
Among 576 questionnaires returned, 76 questionnaires were considered as being directly protested to the WTP questions due to either not being responded, illogically answered from discrete questions (questions #7 to 11 in Table 3), or negative WTP (option 3–4, question #8, in Table 3). Thus, these 76 questionnaires were discarded in this study to remove the biases (Halstead et al., 1992; Pouta & Rekola, 2001). Finally, data from 500 questionnaires were collected and used for calculating WTP. In this study, WTP serves two roles, one is to represent the behavior intention considered as a binary dependent variable in the proposed TRA model shown in Figure 1. If the individual respondent stated “yes” to the question, “are you willing to pay additional price for sustainable coffee?” then one was coded, otherwise, zero was recorded instead. The other is terms of quantity, which is estimated by the logistic regression model.

Table 4 shows the measurement items and scale reliability, or Cronbach Alpha, for the proposed constructs in the TRA model, that is, attitude, subjective norms, ethical belief, environmental belief.
Logistic model

For CVM analysis, behavioral intention can be seen as the expression of willingness to pay in a hypothetical situation (Ajzen et al., 2004). The binary logistic model would be applied to estimate the WTP of respondents toward sustainable coffee. The dependent variable is designed as a dummy assuming that every individual respondent would have two options, that is, is willing to pay or not. The model is specified as follows.

$$P_i(Y = 1|X_i) = \frac{1}{1 + e^{-(\beta_0 + \beta_i \sum X_i)}} \tag{1}$$

Where $P_i$ is the probability that $Y=1$, $X_i$ is a set of independent variables, $\beta_0$ is constant term, $\beta_i$ is coefficient to be estimated corresponding to logistic distribution, and $e$ is the error term. Taking a natural logarithm of equation (1), which becomes equation (2).

$$Li = Ln\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \beta_i \sum X_i + ei \tag{2}$$

Where $Li$, logistic model, is the log of the odd ratio and is linear in both independent variables and parameters. The maximum likelihood estimation method would be used. In this study, WTP responses, as behavior intentions, are predicted the probability of yes ($Y=1$) or when the amount of WTPs which we derive from CVM are greater than THB0.

In addition, the mean WTP can be directly derived from the double bounded dichotomous choice questions (Loumis et al., 1997). It provides four possible alternatives, including; (1) yes, yes (YY: accept price from first and second bid); (2) yes, no (YN: accept price from first bid but not accept from second bid); (3) no, yes (NY: not accept price from the first bid but accept price from the second bid); (4) no, no (NN: not accept price from both first and second bid). The probability of each choice is the actual value obtained from the questionnaire written in the question shown as equation (3).

$$\text{Prob}(YY) + \text{Prob}(YN) + \text{Prob}(NY) + \text{Prob}(NN) = 1 \tag{3}$$

When; $0 \leq \text{Prob}(YY) \leq 1$, $0 \leq \text{Prob}(YN) \leq 1$, $0 \leq \text{Prob}(NY) \leq 1$, $0 \leq \text{Prob}(NN) \leq 1$. Therefore, the calculation of the mean WTP is shown as equation (4).

$$\text{MeanWTP} = \frac{\sum (n_y \times p_y)}{\sum n_y} \tag{4}$$

When; $n$ = The number of respondents who decide to select any options.

$i$ = The option that respondents select ($i_1$ = YY, $i_2$ = YN, $i_3$ = NY, $i_4$ = NN)

$j$ = Initial price ($j_1$, $j_2$, $j_3$, $j_4$)

$p_{ij}$ = Reference prices of any initial prices ($i_1j_1$, $i_1j_2$, $i_1j_3$, $i_1j_4$, $i_2j_1$, $i_2j_2$, $i_2j_3$, $i_2j_4$, $i_3j_1$, $i_3j_2$, $i_3j_3$, $i_3j_4$, $i_4j_1$, $i_4j_2$, $i_4j_3$, $i_4j_4$).

This study integrates two different paradigms, one is addressed on psychosocial variables, attitude, subjective norm, and beliefs, based on Theory of Reasoned Action (Fishbein & Ajzen, 1975), to predict the WTP which is in economic paradigm laid on the CVM framework (Stephens, 2010; Stewart & Kahn, 2006). This study distinguishes WTP as the notion to indicate purchase intention from WTP in financial quantity that has been discussed in extent literature, and therefore it needs to be analyzed separately (Hultman et al., 2015; Meleddu & Pulina, 2016; van Doorn & Verhoef, 2011). In other words, this study argues that WTP can indicate the behavior intention in a more precise and explicit manner.

For evaluating the determinants of WTP, a logistic model is adapted because it is appropriate to the situation with binary dependent variables (Hair et al., 2019). In addition, a probit regression is performed to confirm the results of logistic regression given the fact that it is almost equivalent to the logistic model in most instances of a binary outcome variable (Hair et al., 2019). Data analysis is conducted by Stata 15. To assess the model fit, the study uses model significant tests ($-2LL$), pseudo $R^2$ measure, predictive accuracy, and Hosmer and Lemeshow goodness of fit test. Furthermore, the likelihood ratio (LR) test is applied to investigate the difference and compared the statistical performance between nested models.

Results

Correlation Analysis

The correlations among the variables examined in this study are shown in Table 5. The correlation between attitude and subjective norm; environmental belief; and ethical belief are found to be highly to moderately correlated with the correlation coefficients of .7, .5, .53, respectively; indicating that attitude is strongly related to subjective norm; and both environmental and ethical beliefs.

Estimation for Willingness to Pay

This study proposes three models for estimating WTP, namely Model 1, 2, and 3, to investigate the factors that would affect WTP. Model 1 assumes that other than two constructs, attitude and subjective norms under TRA, consumers’ coffee knowledge, past experience, and the forms of coffee being consumed would affect the individual consumer’s WTP as well, which is expressed as equation (5):
Table 5. Correlations Among Independent Variables.

| Variables      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   |
|----------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1. ATT         | 1.00 |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 2. SN          | .70* | 1.00 |      |      |      |      |      |      |      |      |      |      |      |      |
| 3. ENB         | .50* | .39* | 1.00 |      |      |      |      |      |      |      |      |      |      |      |
| 4. ETB         | .53* | .48* | .75* | 1.00 |      |      |      |      |      |      |      |      |      |      |
| 5. CK          | .20* | .06  | .18* | .17* | 1.00 |      |      |      |      |      |      |      |      |      |
| 6. PASTEXP     | .28* | .22* | .27* | .27* | .49* | 1.00 |      |      |      |      |      |      |      |      |
| 7. AGE         | -.04 | .01  | -.00 | -.10*| .006 | 1.00 |      |      |      |      |      |      |      |      |
| 8. GENDER      | -.07 | -.08 | -.06 | -.14*| -.06 | -.04 | -.11*| 1.00 |      |      |      |      |      |      |
| 9. MS          | -.05 | .06  | -.001| -.01 | -.21*| -.10*| .33* | -.00 | 1.00 |      |      |      |      |      |
| 10. EDU        | .03  | .14* | -.005| -.08 | .08  | .04  | -.06 | .19* | 1.00 |      |      |      |      |      |
| 11. JOB        | -.04 | .05  | -.005| -.03 | -.31*| -.07 | .22* | -.01 | .28* | .26* | 1.00 |      |      |      |
| 12. HS         | .06  | .05  | .025 | .04  | .09  | -.025| -.10*| -.06 | -.22*| -.24*| -.08 | 1.00 |      |      |
| 13. HI         | -.005| .03  | -.06 | .04  | -.04 | -.02 | -.04 | .03  | -.03 | .32* | .14* | -.03 | 1.00 |      |
| 14. ROASTED    | .12* | .14* | .003 | .07  | .005 | .07  | .04  | .03  | .03  | .17* | .10* | -.15*| .07  | 1.00 |

*p < .05.

\[
P(Y = 1 / X_i) = G(\beta_0 + \beta_1 ATT + \beta_2 SN + \beta_3 CK + \beta_4 PASTEXP + \beta_5 ROASTED + \beta_6 INSTANT + \beta_7 PACKAGED + \beta_8 FRESH) = G(x\theta)\
\]

where \( ATT \) represents attitude toward purchasing sustainable coffee; \( SN \) is subjective norms; \( CK \) is for sustainable coffee knowledge; \( PASTEXP \) is past experience regarding sustainable coffee; \( ROASTED \) is “buy roast coffee for self-brewing”; \( INSTANT \) is “buy instant coffee”; \( PACKAGED \) is “purchase packaged coffee drink”; and \( FRESH \) is “buy fresh brewed coffee.” \( CK, PASTEXP, ROASTED, INSTANT, \) and \( PACKAGED \) are dummy variables with value of 1 or 0.

Model 2 postulated that the individual consumer’s demographics rather than the forms of coffee being consumed along with all other variables in Model 1 would affect WTP, that is, as shown by equation (6):

\[
P(Y = 1 / X_i) = G(\beta_0 + \beta_1 ATT + \beta_2 SN + \beta_3 CK + \beta_4 PASTEXP + \beta_5 AGE + \beta_6 GENDER + \beta_7 MS + \beta_8 EDU + \beta_9 JOB + \beta_{10} HS + \beta_{11} HI + \beta_{12} ROASTED + \beta_{13} INSTANT + \beta_{14} PACKAGED + \beta_{15} FRESH) = G(x\theta)\
\]

where \( CK \) represents for sustainable coffee knowledge; \( AGE \) is for age; \( GENDER \) is for gender; \( MS \) is marital status; \( EDU \) is the education level; \( JOB \) is for job; \( HS \) is household size; and \( HI \) is household income. All of them are dummy variables, take on value either 1 or 0.

Model 3 proposed all the independent variables in both Models 1 and 2 would influence the individual consumer’s WTP, which is indicated by equation (7):

\[
P(Y = 1 / X_i) = G(\beta_0 + \beta_1 ATT + \beta_2 SN + \beta_3 CK + \beta_4 PASTEXP + \beta_5 AGE + \beta_6 GENDER + \beta_7 MS + \beta_8 EDU + \beta_9 JOB + \beta_{10} HS + \beta_{11} HI + \beta_{12} ROASTED + \beta_{13} INSTANT + \beta_{14} PACKAGED + \beta_{15} FRESH) = G(x\theta)\
\]

To examine whether Model 3 is more effective than Models 1 or 2 in logistic regression, a likelihood ratio test (LR test) is conducted. The LR statistic is found to be 48.04 (\( p \)-value = .000) for the comparison between Models 1 and 3; while it is 19.10 (\( p \)-value = .0008) when comparing Model 2 to Model 3. These findings lead to conclude that Model 3 outperforms Models 1 and 2 in terms of estimating the WTP. Consequently, Model 3 is chosen as the final model under logistic regression (Table 6).

The estimated results from Model 3 reveal that attitude, past experience, marital status, job, household income, and being consumed roast coffee regularly are statistically significant and positively influenced the WTP. In terms of assessing model fit, the lower the −2LL value proves the better model fit (Hair et al., 2019). The statistical significance of the −2LL value between null model versus Model 3 is LR \( \chi^2(15) = 92.79 \) (Prob > \( \chi^2 = .0000 \)), indicating that the model is statistically significant. Pseudo \( R^2 \) measured for a logistic model is generally lower than \( R^2 \) in multiple regression, that ranged from 0 to 1. Comparing −2LL with pseudo \( R^2 \) allowed to judge whether the model is increasing fit by considering to decrease the value of −2LL toward 0, while increasing the pseudo \( R^2 \) near 1 (Hair et al., 2019). Furthermore, the interpretation of pseudo \( R^2 \) between .20 and .40 is excellent fit (McFadden, 1978). Therefore, the value of pseudo \( R^2 \) in this study is .1340 which is not too high yet not in trouble (Hair...
Nevertheless, it could be acceptable when comparing with the −2LL value. In addition, non-significance of Hosmer and Lemeshow test (Prob $\chi^2 = .6923$) indicates Model 3 is a well-fitted model.

The percentage correctly classified which reflects the overall predictive accuracy is 69.40%. Finally, the classification matrix (Table 7) summarizes the results of the fitted logistic regression with a cut-point of 0.5. It pointed out that 67.22% represent the correct classification as a measure of specificity (true negative rate) compared to the sensitivity (true positive rate) of 71.43%. However, the evaluation of the negative predictive value (NPV) and the positive predictive value (PPV) show that there is a higher PPV value which indicates that if a prediction is positive, it is correct for 70.08% of the time.

The probit regression (Table 8) is used to confirm the outcomes of logistic regression. The model fit is measured by likelihood value, pseudo $R^2$, marginal effects, and Hosmer and Lemeshow test. Again Model 3 performs better when compared to the other two models. The pseudo $R^2$ is .1330, and the marginal effect predicting the probability of yes ($Y = 1$) is as 52.16%. The result of Hosmer and Lemeshow test ($p$-value = .6377) indicates the model is well-fitted. LR test statistics between Models 1 and 3 and between Models 2 and 3 are 47.58 ($p$-value = .000) and 18.36 ($p$-value = .0005), respectively; implying that Model 3 with more variables considered can improve the predicting power toward the WTP. This result is in accordance with the outcome from logistic regression. Therefore, Model 3 is selected as the final model in this study.

### Hypothesis Testing

Table 9 shows the regression results of attitude formation. The results shows that environmental belief, ethical belief, and subjective norm exerts positive effects on attitude toward buying sustainable coffee. In addition, all independent variables explain approximately 56% of variation in attitude formation ($R^2 = .5612$, Adj. $R^2 = .5585$, $p < .01$). Among these three independent variables, subjective norm is found to

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**Table 6. Logistic Regression Analyses Predicting Sustainable Coffee’s Willingness to Pay.**

|                         | Model 1         | Model 2         | Model 3         |
|-------------------------|-----------------|-----------------|-----------------|
| WTP, logistic regression|                 |                 |                 |
| Attitude (ATT)           | .571 (.001)**   | .711 (.000)***  | .686 (.000)***  |
| Subjective norm (SN)     | −.309 (.105)    | −.356 (.072)    | −.374 (.067)    |
| Coffee knowledge (CK)    | −.086 (.731)    | .177 (.502)     | .216 (.435)     |
| Past experience (PASTEXP)| .417 (.076)     | .442 (.067)     | .489 (.049)*    |
| Age                     | .432 (.089)     | .455 (.085)     |                 |
| Gender                  | −.027 (.906)    | −.010 (.968)    |                 |
| Marital status (MS)      | .570 (.009)**   | .677 (.003)**   |                 |
| Education (EDU)          | −.268 (.274)    | −.395 (.121)    |                 |
| Occupation (JOB)         | .649 (.005)**   | .625 (.009)**   |                 |
| Household size (HS)      | .019 (.927)     | .095 (.657)     |                 |
| Household income (HI)    | .950 (.000)***  | 1.040 (.000)*** |                 |
| Roast coffee (ROASTED)   | .829 (.000)***  | .912 (.000)***  |                 |
| Instant coffee (INSTANT) | .024 (.908)     | .323 (.156)     |                 |
| Packaged coffee (PACKAGED)| −.387 (.089)   | −.282 (.239)    |                 |
| Fresh brewed coffee (FRESH)| .089 (.689)   | −.200 (.418)    |                 |
| Constant                 | −1.081 (.020)*  | −2.758 (.000)***| −2.988 (.000)***|

Loglikelihood ($\beta = 0$)   | −346.250        |                 |                 |
Log likelihood               | −323.873        | −309.404        | −299.854        |
LR $\chi^2$                  | 44.75 (.000)*** | 73.69 (.000)*** | 92.79 (.000)*** |
Pseudo $R^2$                 | .0646           | .1064           | .1340           |
Correctly classified (%)     | 61.00           | 67.40           | 69.40           |
Hosmer and Lemeshow test     | .2149           | .7842           | .6923           |
LR test Model 1 versus Model 3| 48.04 (.000)***|                 |                 |
LR $\chi^2(7)$               |                 |                 |                 |
LR test Model 2 versus Model 3| 19.10 (.0008)** |                 |                 |
LR $\chi^2(4)$               |                 |                 |                 |
n                           | 500             | 500             | 500             |

*p < .05. **p < .01. ***p < .001.
affect attitude toward purchasing sustainable coffee the most ($\beta = .576, \ p < .001$), followed by environmental belief ($\beta = .178, \ p < .001$), and ethical belief ($\beta = .126, \ p < .01$). The highest variance inflation factor (VIF) among the independent variables is less than the cut-off value of 10, indicating that there is no multicollinearity among independent variables (Hair et al., 2019). Based upon these results, hypotheses $H_2$, $H_3$, and $H_4$ are supported, which is in agreement with the findings of other studies (Bai et al., 2019; Oroian et al., 2017; Tarkiainen & Sundqvist, 2005; Ueasangkomsate & Santiteerakul, 2016; Zagata, 2012).

The estimation results of the final model (Table 10) reveal that attitude positively affects the WTP, that is, the hypothesis $H_1$ is supported, which is in agreement with Halder et al. (2016), Hultman et al. (2015), O’Connor et al. (2017), and Yazdanpanah and Forouzani (2015). Specifically, it's
consistent with the results of earlier CVM studies that attitudes had predictive power to increase the likelihood of a “yes” answer in predicting WTP, for example, in fields of forest regeneration (Pouta & Rekola, 2001), ecotourism (Meleddu & Pulina, 2016), sustainable integrated agriculture-aquaculture rice (Yi, 2019), eco-labeled food products (Mohamed et al., 2014), green food (Rezai et al., 2013), and safe vegetables (Zhang et al., 2018). Concerning attitude toward sustainable coffee, it is undoubted that favorable attitude would lead to higher purchase intention, and in turn can be indicated by higher willingness to pay. Conversely, subjective norm is found not to be statistically significant to influence WTP, therefore, the hypothesis H4 is rejected. In spite that this finding is inconsistent with most literature, nevertheless it’s in accordance with several studies, for example, in predicting green product consumption (Paul et al., 2016), Fairtrade purchasing decision (O’Connor et al., 2017), and forest regeneration (Pouta & Rekola, 2001).

Hypothesis H6 receives partial support, that is, past experience, marital status, job, household income, and self-brewing roast coffee regularly individually exert a positive effect on the WTP. Among these determinants, household income has shown to exert the highest willingness to pay more (Adamu et al., 2015; Kunituo, 2017; Mohamed et al., 2014; Rezai et al., 2013; Yi, 2019; Zhang et al., 2018), followed by self-brewing, marital status, job, and past experience. Individuals who usually buy roast coffee for self-brewing can be viewed as cautious and demanding regarding their coffee intake, therefore they will be willing to pay more for sustainable coffee because of its associated health and ethical benefits, which is consistent with the finding by Yang et al. (2012), that is, “people who prepare the coffee for themselves are in better position to control the quality of coffee and therefore are more willing to pay for Fairtrade’s additional ethical attributes.” Marital status is the third most important demographic factor, especially for those who are

### Table 9. Regression Analyses Predicting Attitude Formation.

| Variables          | Coef. | SE  | t-Value  | β     | VIF |
|--------------------|-------|-----|----------|-------|-----|
| Environmental belief | 0.166 | 0.042 | 3.97*** | .178  | 2.28|
| Ethical belief      | 0.117 | 0.044 | 2.67**  | .126  | 2.51|
| Subjective norm     | 0.670 | 0.039 | 17.01*** | .576  | 1.30|
| Constant            | −0.023| 0.133| −0.18    |       |     |

Note: \( R^2 = .5612, \text{Adj. } R^2 = .5585, F(3,496) = 211.42, (p < 0.01), \text{Root } \text{MSE} = 0.56084. \)

\( *p < .05. \quad **p < .01. \quad ***p < .001. \)

### Table 10. Hypothesis Testing and Results of the Regression Analysis Based on Model 3.

| H Constructs | OLS (t-value) | Logistic | Probit |
|--------------|---------------|----------|--------|
| ATT \( \rightarrow \) WTP | 1.986 | 98.6 | 3.85*** | 0.1644 | 3.87*** | Supported |
| ENB \( \rightarrow \) ATT | 3.97*** | | | | | Supported |
| ETB \( \rightarrow \) ATT | 2.67** | | | | | Supported |
| SN \( \rightarrow \) WTP | 0.688 | −31.2 | −1.83 | −0.0901 | −1.83 | Rejected |
| SN \( \rightarrow \) ATT | 17.01*** | | | | | Supported |
| CK \( \rightarrow \) WTP | 1.241 | 24.1 | 0.78 | 0.0506 | 0.78 | Rejected |
| PASTEXP \( \rightarrow \) WTP | 1.631 | 63.1 | 1.97* | 0.1147 | 1.97* | Supported |
| AGE \( \rightarrow \) WTP | 1.576 | 57.6 | 1.72 | 0.1065 | 1.69 | Rejected |
| GENDER \( \rightarrow \) WTP | 0.990 | −1.0 | −0.04 | 0.0015 | 0.03 | Rejected |
| MS \( \rightarrow \) WTP | 1.968 | 96.8 | 2.98** | 0.1619 | 3.01** | Supported |
| EDU \( \rightarrow \) WTP | 0.674 | −32.6 | −1.55 | −0.0971 | −1.60 | Rejected |
| JOB \( \rightarrow \) WTP | 1.869 | 86.9 | 2.61** | 0.1483 | 2.62** | Supported |
| HS \( \rightarrow \) WTP | 1.100 | 10.0 | 0.44 | 0.0222 | 0.43 | Rejected |
| HI \( \rightarrow \) WTP | 2.829 | 182.9 | 4.74*** | 0.2471 | 4.94*** | Supported |
| ROASTED \( \rightarrow \) WTP | 2.491 | 149.1 | 3.86*** | 0.2097 | 3.99*** | Supported |
| INSTANT \( \rightarrow \) WTP | 1.382 | 38.2 | 1.42 | 0.0785 | 1.44 | Rejected |
| PACKAGED \( \rightarrow \) WTP | 0.754 | −24.6 | −1.18 | −0.0665 | −1.14 | Rejected |
| FRESH \( \rightarrow \) WTP | 0.820 | −18.0 | −0.81 | −0.0434 | −0.74 | Rejected |

\( *p < .05. \quad **p < .01. \quad ***p < .001. \)
single were found to be willing to pay more for sustainable coffee; this finding is in agreement with Mohamed et al. (2014). Work is the fourth most influential factor; the finding is that those who work full time and are students (in this study, “work full time” and students are grouped together; # of respondents who have full time job is 287; while 50 are students) are willing to pay more for sustainable coffee. Given that most respondents in this group have full time job, therefore, it is reasonable to assume that they should have relatively higher income. Finally, respondents who have past experience with sustainable coffee, would be more likely to pay more for sustainable coffee. Similarly, Mohamed et al. (2014) also found that individuals who have bought ecolabeled food products in the past are more willing to pay than otherwise. In addition, other consumer characteristics, for example, age, gender, household size, drinking coffee habits (i.e., instant coffee, packaged coffee drink, fresh brewed coffee) are not statistically significant to predict WTP. Furthermore, consumer knowledge is found insignificantly associated with the WTP, which is in agreement with O’Connor et al. (2017) who comments that knowledge is not a key factor of consumer decision making, once other factor such as attitude is taken into account. The results of hypothesis testing are presented in Table 10.

According to Table 10, determinants of the WTP for sustainable coffee computed in logistic regression report the odds ratios (OR), while analysis in probit regression present the marginal effect. For logistic and probit regressions, a maximum likelihood estimation is employed to estimate the parameters ($\beta_0$ and $\beta_1$). However, the coefficients cannot be interpreted in the standard manner, the odds ratio and the marginal effects are therefore computed, which are interpreted as the effect of a unit increase in independent variable on the probability (Stephens, 2010). Given the odds ratios shown in Table 10, for attitude, the odds ratio of 1.986 means that increasing one score of attitude will increase the probability by 98.60% for the consumers to pay higher WTP. Regarding previous experience, individuals who heard and purchased sustainable coffee in the past would have a higher probability of 63.10% to pay higher WTP when compared against those who have no prior experience. For the marital status, single consumers would have a higher probability of 96.80% for paying higher WTP, as compared to their counterparts. Concerning the job, consumers who work full-time outside home or are university students would have higher probability of 86.90% for paying higher WTP, when compared to others (i.e., self-employed, housewives or husbands). In terms of household income, the probability of individual consumer’s household income of THB30,000 or more would have a higher probability of 182.90% to pay higher WTP, when compared to others. Finally, the respondents who have self-brewed roast coffee regularly would have a higher probability of 149.10% for paying higher WTP as compared to others who do not.

According to the results from the probit model (Table 10), the marginal effect can be interpreted as the increase in the probability of the higher value of dependent variable resulting from 1 unit increase in the independent variable. Given the marginal effect of 0.1644 for attitude, it can be interpreted as that the probability of higher WTP will increase by 16.44% if there is 1 unit increase in attitude. Consumers will pay higher WTP for sustainable coffee with higher probability of 11.47%, 16.19%, 14.83%, 20.97%, and 24.71% for who have past experience of sustainable coffee, being single, work full time or being students, self-brewed roast coffee regularly, and have higher household income of THB30,000 or more, respectively, as compared to their counterparts. These findings are in complete accord with those under logistic model.

The main limitation of logistic and probit models is that the estimated coefficients cannot be interpreted properly, the odds ratio and the marginal effects are therefore computed. Moreover, due to the constraint that the coefficients in these models do not represent monetary values directly, authors therefore separately investigate the mean WTP which is directly derived from the double bounded dichotomous questions (Table 11). The common variables in three models (equations (5)-(7)) are TRA variables, that is, attitude and subjective norms, and consumer coffee consumption characteristics. A likelihood ratio test (LR test) is conducted and confirmed that Model 3 (equation (7)) outperforms Models 1 and 2, therefore it is chosen as the final model. Overall, logistic and probit models render consistent results in terms of signs and statistical significance of coefficients. Attitude, past experience, marital status, job, household income, and drink roast coffee are found to be significant determinants to predict the WTP.

### Discussion

This study aims to investigate the willingness to pay (WTP) for sustainable coffee in Thailand by employing contingent valuation method (CVM). The hypotheses are established to assess constructs under Fishbein and Ajzen’s theory of

| Table 11. The Mean WTP for Sustainable Coffee. |
|-----------------------------------------------|
| Willingness to pay for sustainable coffee | N          | Total WTP | Mean WTP  | SE  | Percentage of premium price |
|-------------------------------------------|------------|-----------|-----------|-----|----------------------------|
|                                            | 500        | 36,475    | THB72.95* | 4.59| 36.48%                     |

*The mean price adjusted by WTP for 250-g package of sustainable whole bean roast coffee is THB272.95 which is higher than the base price of THB200 (THB1 = $US0.033).
reasoned action (TRA), that is, attitude and subjective norm, along with consumer characteristics to predict WTP toward sustainable coffee. In addition, the attitude formation is also investigated. The findings support all hypotheses other than that for subjective norm. The premium price of sustainable coffee is found to be 36.48%, indicating that the Thai consumers are willing to pay 36.48% more for sustainable coffee than the price of conventional coffee.

The hypothesis $H_1$ regarding the impact of attitude on WTP for sustainable coffee is confirmed, that is, attitude positively affects consumer’s WTP for sustainable coffee. Concerning attitude toward sustainable coffee, it is undoubted that favorable attitude would lead to higher purchase intention (Armitage & Conner, 2001; Halder et al., 2016; Hultman et al., 2015; Tsen et al., 2006; Yazdanpanah & Forouzani, 2015) that can be indicated by higher willingness to pay for sustainable coffee (Meleddu & Pulina, 2016; Mohamed et al., 2014; Rezai et al., 2013; Saleem & Recker, 2014; Yi, 2019; Zhang et al., 2018). The hypotheses $H_2$, $H_3$, and $H_4$ are supported, that is, environmental and ethical beliefs, and subjective norm respectively shape the attitude toward sustainable coffee. These results are in line with the previous studies that found attitude formation was based on environmental belief (Bai et al., 2019; Pouta & Rekola, 2001); ethical belief (Zagata, 2012); and subjective norm (López-Mosquera et al., 2014; Pouta & Rekola, 2001). The hypothesis $H_5$ is rejected; or subjective norm is found to be statistically insignificant to exert influence on WTP for sustainable coffee, which is consistent with many previous studies, for example, O’Connor et al. (2017), Paul et al. (2016), and Pouta and Rekola (2001). It could be implied that people residing in metropolitan area, such as Bangkok, tend to be more individualism oriented (Buriyameathagul, 2013; Han et al., 2017), consequently that subjective norm or social pressure does not directly affect people’s behavior.

The hypothesis $H_6$ is to examine the impacts of consumer characteristics on WTP, the results are that household income has shown to exert the highest WTP more, followed by self-brewing, marital status, job, and past experience. These results are as expected. Normally sustainable coffee relatively costly, by its very nature, with higher household income indicating the higher purchase power which can allow for this kind of luxury consumption; the result is consistent with the previous studies (Adamu et al., 2015; Kunituo, 2017; Mohamed et al., 2014; Rezai et al., 2013; Yi, 2019; Zhang et al., 2018). Individuals who usually buy roast coffee for self-brewing can be viewed as cautious and demanding regarding their coffee intake, therefore they will be willing to pay more for sustainable coffee because of its associated health and ethical benefits (Yang et al., 2012). Single consumers are discovered to be willing to pay more for sustainable coffee, which may be attributed to their financial situation that very likely they do not have to financially support others, or they are basically autonomous to their purchase decision (Mohamed et al., 2014). In terms of job, given that most respondents in this group have full time job, therefore, it is reasonable to assume that they should have relatively higher income. In fact, there exists a positive correlation between household income and job (Table 5), as a consequence, they are more willing to pay a premium price for sustainable coffee. Finally, respondents who have past experience with sustainable coffee, if they were reinforced with positive prior experience, would be more likely to pay more for sustainable coffee (Mohamed et al., 2014).

**Implications**

Once the determinants of WTP are revealed, various stakeholders in the coffee industry can act accordingly to develop the sustainable value-added supply chain. For example, strategies which can reinforce consumers’ environmental and ethical beliefs toward sustainable coffee; and positively affect subjective norm should be addressed as a segmentation tool to attract ethical consumers (Maciejewski et al., 2019). Likewise, marketing strategies and tactics should be developed to target those who are single, richer, self-brewing, and having past experience of sustainable coffee. In other words, retailers, roasters, distributors, and wholesalers can develop effective strategies and campaigns to fulfill consumer demand for sustainable coffee; local farmers could be encouraged to switch from conventional farming to sustainable practices in producing environmentally friendly coffee, and in turn to improve their well-beings by being rewarded with fair returns; along the line, coffee farm workers are guaranteed to receive fair wages and job-related benefits. Of course, to achieve this, the role of government cannot be overlooked, it needs to design the policy to foster and support all the means adapted by various stakeholders in the industry to comply with SDG #12 (UN, 2020). The government could subsidize cost of production and certification that could motivate coffee farmers to certify their coffee bean by joining VSS program. Stakeholders in coffee industry should aim for reducing potential restriction that could hinder access to sustainable coffee (Kunituo, 2017). In the hope to pull small coffee farmers out of current dilemma, government and investors, on one hand, should teach small farmers to operate in a more efficient way; and on the other hand, should address on how certification from VSS can add value to their produce, and in turn higher return can be realized; along the line, competitiveness over a longer period of time can be realized (Maciejewski et al., 2019).

**Limitations and Future Research**

There are some limitations by this study. Data were collected only in Bangkok during the COVID-19 pandemics which definitely affected the respondents’ willingness and cooperation in answering the questionnaires due to the requirement of practicing social distancing. Future research could expand to gather data across countries or regions as well as add more
constructs to improve the predicting power of the model, for example, self-identity, social identity, trust, perception, etc.

Conclusions

Different from the extent literature, the WTP derived from the survey in this study is considered as the behavioral intention to be adapted in theory of reasoned action (TRA). The contingent valuation method (CVM) is employed to elicit the consumers’ WTP. This study incorporates attitude and subjective norms that are the main variables under the TRA with consumer characteristics to evaluate the economic value or WTP, which in turn can be seen as behavioral intention in TRA. The results show that attitude is positively affected the WTP; however, subjective norm is not statistically significant to influence WTP; yet it exerts influence on attitude. In addition, consumer characteristics such as past experience, marital status, job, household income, and self-breeding roast coffee regularly are shown to impose a positive effect on the WTP.

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References

Adamu, A., Yacob, M. R., Radam, A., & Hashim, R. (2015). Factors determining visitors’ willingness to pay for conservation in Yankari game reserve, Bauchi, Nigeria. *International Journal of Management and Economics*, 9, 95–114.

Ajzen, I., Brown, T. C., & Carvajal, F. (2004). Explaining the discrepancy between intentions and actions: The case of hypothetical bias in contingent valuation. *Personality and Social Psychology Bulletin*, 30, 1108–1121.

Akenji, L. (2014). Consumer scapegoatism and limits to green consumerism. *Journal of Cleaner Production*, 63, 13–23.

Alberini, A. (1995). Optimal designs for discrete choice contingent valuation surveys: Single-bound, double-bound, and bivariate models. *Journal of Environmental Economics and Management*, 28, 287–306.

Angkasith, P. (2001, February 26–28). Coffee production status and potential of organic arabica coffee in Thailand [Paper presented]. The First Asian Regional Round-table on Sustainable, Organic and Specialty Coffee Production, Processing and Marketing, Chiang Mai, Thailand. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.587.7612&rep=rep1&type=pdf

Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behaviour: A meta-analytic review. *British Journal of Social Psychology*, 40, 471–499.

Bai, L., Wang, M., & Gong, S. (2019). Understanding the antecedents of organic food purchases: The important roles of beliefs, subjective norms, and identity expressiveness. *Sustainability*, 11, 3045.

Bank of Thailand. (2021, February 25). *Quality coffee: A solution for Thai farmers*. https://www.bot.or.th/Thai/MonetaryPolicy/RegionalEconomy/DocLib14/Coffee_Final_020620.pdf

Bhattarak, K. (2019). Consumers’ willingness to pay for organic vegetables: Empirical evidence from Nepal. *Economics & Sociology*, 12, 132–146.

Bray, J. G., & Neilson, J. (2017). Reviewing the impacts of coffee certification programmes on smallholder livelihoods. *International Journal of Biodiversity Science Ecosystems Services & Management*, 13, 216–232.

Bujang, M. A., Sa’at, N., Sidik, T. M. I. T. A. B., & Joo, L. C. (2018). Sample size guidelines for logistic regression from observational studies with large population: Emphasis on the accuracy between statistics and parameters based on real life clinical data. *Malaysian Journal of Medical Sciences*, 25, 122–130.

Buriyameathagul, K. (2013). Characteristics of culture in Thai society and virtual communities. *Silpakorn University Journal of Social Sciences, Humanities, and Arts*, 13, 207–270.

Cerjak, M., Naglić, T., Mesić, Z., & Tomić, M. (2015, March 25–27). Croatian consumers’ knowledge and attitudes towards fair trade [Symposium]. 143rd Joint EAAE/AAEA Seminar, Naples, Italy. https://ageconsearch.umn.edu/record/202756/files/282.pdf

Department of Trade Negotiations. (2021, February 25). *Coffee products*. https://api.dtn.go.th/files/v3/5e8712f2ef4140204c3022ce/download

D’Souza, C., & Taghian, M. (2005). Green advertising effects on attitude and choice of advertising themes. *Asia Pacific Journal of Marketing and Logistics*, 17, 51–66.

Evanschitzky, H., & Wunderlich, M. (2006). An examination of moderator effects in the four-stage loyalty model. *Journal of Service Research*, 8, 330–345.

Fairvare, N., Cardoso Castro Rego, F. M., Moreno Rodriguez, J. M., Vallejo Calzada, V. R., & Xanthopoulos, G. (2018). *Forest fires: Sparking fire smart policies in the EU*. European Commission.

Feather, N. T. (1982). *Expectations and actions: Expectancy-value models in psychology*. Lawrence Erlbaum Assoc Incorporated.

Fishbein, M. (1963). An investigation of the relationships between beliefs about an object and the attitude toward that object. *Human Relations*, 16, 233–239.

Fishbein, M. (1967). A consideration of beliefs and their role in attitude measurement. In M. Fishbein (Ed.), *Readings in attitude theory measurement* (pp. 257–266). John Wiley.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Addison-Wesley Publishing Company.

Gallenti, G., Troiano, S., Cosmina, M., & Marangon, F. (2016). Ethical and sustainable consumption in the Italian coffee market: A choice experiment to analyse consumers’ willingness to pay. *Rivista di Economia Agraria*, 71, 153–176.

Gao, Z., Li, C., Bai, J., & Fu, J. (2020). Chinese consumer quality perception and preference of sustainable milk. *China Economic Review*, 59, 100939.
Giovannucci, D., & Ponte, S. (2005). Standards as a new form of social contract? Sustainability initiatives in the coffee industry. *Food Policy, 30*, 284–301.

Grabs, J., Kilian, B., Hernández, D. C., & Dietz, T. (2016). Understanding coffee certification dynamics: A spatial analysis of voluntary sustainability standard proliferation. *International Food and Agribusiness Management Review, 19*, 31–56.

Gramling, C. (2020, April 24). Australia’s wildfires have now been linked to climate change. https://www.sciencenews.org/article/australia-wildfires-climate-change

Hainmueller, J., Hiscox, M. J., & Sequeira, S. (2015). Consumer demand for fair trade: Evidence from a multistore field experiment. *The Review of Economics and Statistics, 97*, 242–256.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage Learning EMEA.

Halder, P., Pietarinen, J., Havu-Nuutinen, S., Pollänen, S., & Pelkonen, P. (2016). The theory of planned behavior model and students’ intentions to use bioenergy: A cross-cultural perspective. *Renewable Energy, 89*, 627–635.

Halstead, J. M., Luloff, A. E., & Stevens, T. H. (1992). Protest bidders in contingent valuation. *Northeastern Journal of Agricultural and Resource Economics, 21*, 160–169.

Han, H., Kiatkawsin, K., Kim, W., & Lee, S. (2017). Investigating customer loyalty formation for wellness spa: Individualism vs. Collectivism. *International Journal of Hospitality Management, 67*, 11–23.

Hultman, M., Kazeminia, A., & Ghasemi, V. (2015). Intention to visit and willingness to pay premium for ecotourism: The impact of attitude, materialism, and motivation. *Journal of Business Research, 68*, 1854–1861.

Hu, W., Woods, T., Bastin, S., Cox, L., & You, W. (2011). Assessing consumer willingness to pay for value-added blueberry products using a payment card survey. *Journal of Agricultural and Applied Economics, 43*, 243–258.

International Coffee Organization. (2021, March 3). Total production by all exporting countries. http://www.ico.org/historical/990%20onwards/PDF/1a-total-production.pdf

International Trade Centre. (2020). More from the cup: Better returns for East African coffee producers. International Trade Centre. Keaveney, S. M., & Parthasarathy, M. (2001). Customer switching behavior in online services: An exploratory study of the role of selected attitudinal, behavioral, and demographic factors. *Journal of the Academy of Marketing Science, 29*, 374–390.

Kunito, J. (2017). Consumers’ preferences and willingness to pay for certified vegetables in Ouagadougou, Burkina Faso [Doctoral dissertation, University for Development Studies, Ghana]. http://udspace.udes.ac.uw/handle/123456789/1212

Lentijo, G. M., & Hostetter, M. (2020, April 1). Evaluating certified coffee programs. https://edis.ifas.ufl.edu/auw351

Liobikienė, G., Mandravickaitė, J., & Bernatonienė, J. (2016). Theory of planned behavior approach to understand the green purchasing behavior in the EU: A cross-cultural study. *Ecological Economics, 125*, 38–46.

Liu, C. C., Chen, C. W., & Chen, H. S. (2019). Measuring consumer preferences and willingness to pay for coffee certification labels in Taiwan. *Sustainability, 11*, 1297.

Loomis, J., Brown, T., Lucero, B., & Peterson, G. (1997). Evaluating the validity of the dichotomous choice question format in contingent valuation. *Environmental and Resource Economics, 10*, 109–123.

López-Mosquera, N., García, T., & Barrena, R. (2014). An extension of the theory of planned behavior to predict willingness to pay for the conservation of an urban park. *Journal of Environmental Management, 135*, 91–99.

Louvrie, J. J., Flynn, T. N., & Carson, R. T. (2010). Discrete choice experiments are not conjoint analysis. *Journal of Choice Modelling, 3*, 57–72.

Louvrie, J. J., & Hensher, D. A. (1982). On the design and analysis of simulated choice or allocation experiments in travel choice modelling. *Transportation Research Record, 890*, 11–17.

Louvrie, J. J., & Woodworth, G. (1983). Design and analysis of simulated consumer choice or allocation experiments: An approach based on aggregate data. *Journal of Marketing Research, 20*, 350–367.

Maaya, L., Meulders, M., Surmont, N., & Vandebroek, M. (2018). Effect of environmental and altruistic attitudes on willingness-to-pay for organic and fair trade coffee in Flanders. *Sustainability, 10*, 4496.

Maciejewski, G., Mokrys, S., & Wróblewski. (2019). Segmentation of coffee consumers using sustainable values: Cluster analysis on the polish coffee market. *Sustainability, 11*, 613.

Maichum, K., Parichatnon, S., & Peng, K. C. (2016). Application of the extended theory of planned behavior model to investigate purchase intention of green products among Thai consumers. *Sustainability, 8*, 1077.

Mamat, M. P., Yacob, M. R., Radam, A., Abdul Ghani, A. N., & Fui, L. H. (2013). Willingness to pay for protecting natural environments in Pulau Redang Marine Park, Malaysia. *Forest Research, 1*, 120–125.

McFadden, D. (1978). Quantitative methods for analyzing travel behaviour of individuals: Some recent developments. In D. A. Hensher & P. R. Stopher (Eds.), *Behavioural travel modelling* (pp. 279–318). Croom Helm.

Meleduu, M., & Pulina, M. (2016). Evaluation of individuals’ intention to pay a premium price for ecotourism: An exploratory study. *Journal of Behavioral and Experimental Economics, 65*, 67–78.

Mogas, J., Riera, P., & Bennett, J. (2002). A comparison of contingent valuation and choice modelling: Estimating the environmental values of Catalanion Forests. National Centre for Development Studies, Australian National University.

Mohamed, Z., Kit Teng, P., Rezai, G., & Sharifuddin, J. (2014). Malaysian consumers’ willingness-to-pay toward eco-labeled food products in Klang Valley. *Journal of Food Products Marketing, 20*, 63–74.

Newsom, D., & Milder, J. C. (2018). *Rainforest alliance impacts report: Partnership, learning and change*. Rainforest Alliance.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). McGraw-Hill.

Oroian, C., Safirescu, C., Harun, R., Chichiudean, G., Arion, F., Muresan, I., & Bordeanu, B. (2017). Consumers’ attitudes towards organic products and sustainable development: A case study of Romania. *Sustainability, 9*, 1559.

O’Connor, E. L., Sims, L., & White, K. M. (2017). Ethical food choices: Examining people’s fair trade purchasing decisions. *Food Quality and Preference, 60*, 105–112.

Paul, J., Modi, A., & Patel, J. (2016). Predicting green product consumption using theory of planned behavior and reasoned action. *Journal of Retailing and Consumer Services, 29*, 123–134.
Pedregal, V. D., & Ozcaglar-Toulouse, N. (2011). Why does not everybody purchase fair trade products? The question of the fairness of fair trade products’ consumption for consumers. *International Journal of Consumer Studies, 35*, 655–660.

Pongthong, P., & Masahiro, Y. (2014). Coffee farmers’ attitudes toward the 4C process in Chumphon Province, Southern Thailand. *Journal of Agricultural Extension and Rural Development, 6*, 249–258.

Pouta, E., & Rekola, M. (2001). The theory of planned behavior in predicting willingness to pay for abatement of forest regeneration. *Society & Natural Resources, 14*, 93–106.

Rezai, G., Kit Teng, P., Mohamed, Z., & Shamsudin, M. N. (2013). Consumer willingness to pay for green food in Malaysia. *Journal of International Food & Agribusiness Marketing, 25*, 1–18.

Rotaris, L., & Danielis, R. (2011). Willingness to pay for fair trade coffee: A conjoint analysis experiment with Italian consumers. *Journal of Agricultural & Food Industrial Organization, 9*, 1–22.

Saleem, B., & Recker, A. (2014). The effects of consumer knowledge and values on attitudes and purchase intentions: A quantitative study of organic personal care products among German female consumers [Master’s thesis, Umeå University, Umeå, Sweden]. http://www.diva-portal.org/smash/get/diva2:733253/FULLTEXT01.pdf

Samoggia, A., & Riedel, B. (2018). Coffee consumption and purchasing behavior review: Insights for further research. *Appetite, 129*, 70–81.

Sepúlveda, W. S., Chekmam, L., Maza, M. T., & Mancilla, N. O. (2016). Consumers’ preference for the origin and quality attributes associated with production of specialty coffees: Results from a cross-cultural study. *Food Research International, 89*, 997–1003.

Smith, V. K. (2006). Fifty years of contingent valuation. In A. Alberini & J. R. Kahn (Eds.), *Handbook on contingent valuation* (pp. 7–65). Edward Elgar Publishing Limited.

Splash, C. L., Urama, K., Burton, R., Kenyon, W., Shannon, P., & Hill, G. (2009). Motives behind willingness to pay for improving biodiversity in a water ecosystem: Economics, ethics and social psychology. *Economicological Economics, 68*, 955–964.

Statista. (2021, February 25). *Coffee Thailand*. https://www.statista.com/outlook/30010000/126/coffee/thailand

Stephens, M. (2010). Review of stated preference and willingness to pay methods. The Competition Commission.

Stewart, S., & Kahn, J. R. (2006). An introduction to choice modeling for non-market valuation. In A. Alberini & J. R. Kahn (Eds.), *Handbook on contingent valuation* (pp. 153–176). Edward Elgar Publishing Limited.

Takahashi, R., Todo, Y., & Funaki, Y. (2018). How can we motivate consumers to purchase certified forest coffee? Evidence from a laboratory randomized experiment using eye-trackers. *Ecological Economics, 150*, 107–121.

Tarkianen, A., & Sundqvist, S. (2005). Subjective norms, attitudes and intentions of finnish consumers in buying organic food. *British Food Journal, 107*, 808–822.

Tseng, C. H., Phang, G., Hasan, H., & Buncha, M. R. (2006). Going green: A study of consumers’ willingness to pay for green products in Kota Kinabalu. *International Journal of Business and Society, 7*, 40–54.

Ueasangkomsate, P., & Santiteerakul, S. (2016). A study of consumers’ attitudes and intention to buy organic foods for sustainability. *Procedia Environmental Sciences, 34*, 423–430.

United Nations. (2020, June 26). Sustainable development goals. https://sustainabledevelopment.un.org/sdgs

United Nations Environment Programme. (2001). *Bangkok state of the environment 2001*. UNEP RRC.AP.

van Doorn, J., & Verhoef, P. C. (2011). Willingness to pay for organic products: Differences between virtue and vice foods. *International Journal of Research in Marketing, 28*, 167–180.

Vassanadumrongdee, S., & Kittipongvises, S. (2018). Factors influencing source separation intention and willingness to pay for improving waste management in Bangkok, Thailand. *Sustainable Environment Research, 28*, 90–99.

Voora, V., Bermúdez, S., & Larrea, C. (2020, April 2). *Global market report: Coffee*. https://www.isid.org/sites/default/files/publications/ssi-global-market-report-coffee.pdf

Wang, L., & Huo, X. (2016). Willingness-to-pay price premiums for certified fruits—A case of fresh apples in China. *Food Control, 64*, 240–246.

Whitehead, J. C. (2006). A practitioner’s primer on the contingent valuation method. In A. Alberini & J. R. Kahn (Eds.), *Handbook on contingent valuation* (pp. 66–91). Edward Elgar Publishing Limited.

Winter, E., Marton, S. M. R. R., Baumgart, L., Curran, M., Stolze, M., & Schader, C. (2020). Evaluating the sustainability performance of typical conventional and certified coffee production systems in Brazil and Ethiopia based on expert judgements. *Frontiers in Sustainable Food Systems, 4*, 49.

Wolfe, K. L., & Shanklin, C. W. (2001). Environmental practices and management concerns of conference center administrators. *Journal of Hospitality & Tourism Research, 25*, 209–216.

Yadav, R., & Pathak, G. S. (2016). Young consumers’ intention towards buying green products in a developing nation: Extending the theory of planned behavior. *Journal of Cleaner Production, 135*, 732–739.

Yang, S. H., Hu, W., Mapandawana, M., & Liu, Y. (2012). Consumer willingness to pay for fair trade coffee: A Chinese case study. *Journal of Agricultural and Applied Economics, 44*, 21–34.

Yazdanpanah, M., & Forouzani, M. (2015). Application of the theory of planned behaviour to predict Iranian students’ intention to purchase organic food. *Journal of Cleaner Production, 107*, 342–352.

Yi, S. (2019). Contingent valuation of sustainable integrated agriculture–aquaculture products: The case of rice–fish farming systems in South Korea. *Agronomy, 9*, 601.

Zagata, L. (2012). Consumers’ beliefs and behavioural intentions towards organic food. Evidence from the Czech Republic. *Appetite, 59*, 81–89.

Zhang, B., Fu, Z., Huang, J., Wang, J., Xu, S., & Zhang, L. (2018). Consumers’ perceptions, purchase intention, and willingness to pay a premium price for safe vegetables: A case study of Beijing, China. *Journal of Cleaner Production, 197*, 1498–1507.