Estimating Preferences for Wood Furniture in Terms of Sustainable Forest Management

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Abstract: The world’s forest area decreased to three point nine billion hectares in 2015, a net annual loss of 3.3 million hectares, and large-scale deforestation is occurring in the tropics. Furthermore, greenhouse gas emissions are increasing as forests are converted to other uses such as agricultural land. Against this backdrop, sustainable forest management is becoming increasingly important. This study attempts to quantify people’s general awareness and values concerning for on-line shopping habits (in this study, for wooden furniture) in terms of sustainable forest management in Japan by estimating the acceptable price premium or willingness of consumers to pay for wood-related products made using wood produced under sustainable forest management as the raw material. The study proceeds to quantify the awareness and values of consumers concerning sustainable forest management and conservation of forest environments. Consumers were found to have a certain willingness to pay for wooden furniture made from wood produced through sustainable forest management. As a consequence of this analysis, it was revealed that consumers place a high value on sustainable forest management and environmental conservation, and that they are willing to act on these values when purchasing wood-related products.

Keywords: wood products; sustainable forest management; consumer preferences; furniture; contingent valuation; stated preference method

1. Introduction

According to the Global Forest Resources Assessment (FRA) 2015 conducted by the Food and Agriculture Organization (FAO) of the United Nations, the world’s forest area decreased from 4.128 billion hectares in 1990 to 3.999 billion hectares in 2015. The ratio of forested area declined from 31.6% to 30.6%. With a net annual loss of 3.3 million hectares, large-scale deforestation is occurring in the tropics [1–3]. Approximately 11% of global greenhouse gas emissions are attributed to the conversion of forests to other uses such as agricultural land [4]. Many plants grow in forests, and many animals feed on these plants and live in the trunks of wood and in the soil. These organisms have developed close and complex relationships in forests, which can be seriously impacted by disturbances such as logging [1,2].

There is an increasing need for measures that can control deforestation and forest degradation and preserve forests for future generations. One of these measures is sustainable forest management [2,5,6]. Protecting and increasing the number of high-quality forests with rich biodiversity is expected to promote the maintenance and increase of carbon absorption and the reduction of emissions, thereby contributing to the mitigation of climate change [2,5–7]. The importance of enhancing sustainable forest management for the benefit and conservation of biodiversity was confirmed at the fifteenth Conference of the Parties (COP) meetings in Copenhagen [7–9].
1.1. Sustainable Forest Management

The International Tropical Timber Organization (ITTO) defines sustainable forest management (SFM) as "the process of managing forest to achieve one or more clearly specified objectives of management with regard to the production of a continuous flow of desired forest products and services without undue reduction of its inherent values and future productivity and without undue undesirable effects on the physical and social environment." This definition bears on the following SFM objectives: (i) continuously satisfying the need for goods and environmental services from forests; (ii) ensuring the conservation of forest soils, water, and carbon stocks; (iii) conserving biodiversity; (iv) maintaining the resilience and renewal capacity of forests, including for carbon storage; (v) supporting the food security requirements and cultural and livelihood needs of forest-dependent communities; and (vi) ensuring the equitable sharing of the responsibilities involved in forest management and of the benefits arising from forest use [10]. The ITTO assists its tropical member countries in the sustainable management of their forest resources by providing support on aspects such as criteria and indicators for sustainable forest management, the preservation of biodiversity, forest governance, and the processing of forest products [2,5,10].

Forest certification first emerged in the late 1980s as a means of encouraging consciousness of tropical deforestation and forest degradation [11,12], and ensuring compliance with sustainable forest management [13–15]. Various certification schemes are currently used as a way of assuring consumers that the various aspects of sustainability and environmental conservation are being considered. This includes the certification of timber produced from sustainable forest management and the certification of products made from such timber [2,5]. Ecolabels are marks or signs that inform consumers of how a product or service contributes to reducing environmental impact [11,13,16]. They are attached to products, packaging, etc., and are used as marks intended for guidance when consumers want to purchase goods or services that contribute to reducing environmental impact [2,5].

Consumer interest in environmental issues and certification influences consumers' purchasing patterns, and certain consumers tend to purchase certified wood products [17–19]. However, consumer motivations are highly variable, and while certain of them may believe in such certification schemes, others may be skeptical of the very same certification schemes [20]. It has been reported that consumers prefer certified products when they are priced the same as non-certified products [21]. One certification scheme is ecolabels, which indicate whether a product has been made taking sustainability into consideration [22]. Consumers’ WTP (willingness to pay) for an ecolabel is influenced by the scheme of the ecolabel, its content, and the product information to which it is attached [22,23].

1.2. Purpose of the Present Study

This paper aims to quantify consumer preferences for sustainable forest management in Japan. In general, the contingent valuation (CV) method is used as the main quantification method. In this study, wooden furniture was selected as the wood-related product of interest for the application of CV. As background, beginning in 2006, in accordance with the Act on Promoting Green Procurement [24] the Japanese government has required government offices to purchase timber and wood products that have been certified for sustainable forest management and legality. Further, in 2017 the Japanese government enacted the Clean Wood Act [25], which requires the private sector to verify, use, and certify legal timber in its transactions for the material used in wooden furniture. In addition, the Japan Furniture Industry Association has introduced a certification system to prove the legality of timber used as materials [26]. This background provides the context for the selection of furniture as the wood product category.

There are few studies on environmental responsibility and consumers' behavior concerning furniture products [27]. Barbaritano and Savelli [27] considered the relationship between the symbolic dimension of design and purchasing intention when consumers are
Concerned about environmental issues. Wood furniture products provide environmental opportunities, and historic furniture pieces have been sequestering forest carbon for long time [28]. Decisions concerning furniture design will become more important in green supply chains from the selection of materials [28].

Based on this background, the present study attempts to statistically quantify the extent to which consumers consider whether the wood used as raw material is produced from sustainable forest management when purchasing wood-related products with environmental information labels.

1.3. Consumer Preferences when Shopping Online for Furniture

Consumers view their furniture as extensions of themselves; furniture is a status symbol, and wooden furniture is considered a permanent investment [29]. In the process of purchasing furniture, quality, price, and additional service are important factors [30,31]. In particular, ‘high quality’ is important for many respondents [32]; when purchasing certain items, for instance, the quality and design of the product is most important [33][34]. Price is another important factor in purchasing decisions about furniture, and the trend towards environmental protection is apparent as well [35]; however, quality remains the most important part of consumers’ purchase decision [36].

In recent years, the purchase of furniture using E-Commerce (EC) or online shopping has been increasing owing to the spread of the internet and the impact of the COVID-19 pandemic.

As of 2019, the internet penetration rate in Japan was 89.8%. Out of a total of approximately JPY 6.9 trillion in advertising expenditures in 2019, internet advertising expenditures were JPY 2.1 trillion, exceeding JPY 2 trillion for the first time ever [37,38]. Furthermore, TV media advertising expenditures reached JPY 1.8 trillion, meaning that internet advertising expenditures exceeded TV media advertising expenditures for the first time ever. Against this backdrop, the estimated size of the business-to-consumer e-commerce market in Japan was approximately JPY 19.3 trillion in 2019 [37,38]. Particularly in the product sales sector, business-to-consumer e-commerce sales amounted to JPY 10.5 trillion, representing an EC conversion rate of 6.76%. Over the past few years, business-to-consumer e-commerce sales have been growing steadily [37,38].

The estimated market size for the furniture, interior goods, and household goods category was JPY 1.7 trillion, representing an EC conversion rate of 23.3% [38]. For example, major furniture retailers recorded a sharp increase in sales via EC sites in fiscal year 2019 [39]. At the same time, the frequency of using ‘real’ stores has declined [40].

Furniture and interior goods have high unit prices and long service lives, and consumer needs and preferences are diverse. However, brick-and-mortar stores are limited in the number of products that they can display and stock due to the fact that furniture is large and heavy, making it difficult to comprehensively meet consumer needs [37]. On the other hand, EC sites can display a multitude of products in different colors and sizes that cannot be displayed in stores, including coordinated sets of furniture, which are extremely effective drivers of EC sales [37].

The acceptance rate of online shopping in the furniture industry might be lower than in other sectors because of high prices and shipping fees for furniture; however, many players in the furniture industry have set up e-commerce avenues to support online shopping [41]. It is widely considered that online furniture shopping provides a substantial benefit to consumers in spite of its risk factor proportion [41].

2. Materials and Methods

2.1. Study Methods

The contingent valuation (CV) method, which until now has been used mainly in the field of environmental economics, attempts to quantify the value of a survey object through econometric utility of welfare measurements by directly asking consumers
through surveys about their willingness to pay and willingness to accept assuming a hypothetical situation [42,43].

It is important to elicit the determinants of purchasing decisions of furniture [44] in order to investigate consumer preference. In addition, consumer awareness about the environment and environmental certification may influence consumers’ purchasing patterns, and certain consumers tend to purchase certified wood products [19]. As the method is conducted under the assumption of a hypothetical situation, direct questioning of the subjects is employed. In this study, we adopted open-ended CV and estimated the mean WTP. In addition, we estimated the bootstrap mean by resampling the data to obtain a new set of parameter estimates. Although open-ended CV incurs a bias due to non-response, protest, zero response, and outliers, these were excluded by setting restrictions on the input data, such as zero or outlier restrictions, etc., in our online survey format. An example of the specific question statements regarding CV used in our survey is provided below (Table 1); the questions were of two types (designated Q and Q‘), as follows:

**Table 1. Questionnaire of the CV.**

| Questionnaire | Content |
|---------------|---------|
| Q type 1      | Suppose you are shopping online for a wooden table and you find a wooden table that you like (price: 10,000 yen). If there is another wooden table of exactly the same design and quality, bearing the explanation label “We use wood produced under sustainable forest management for the purpose of preventing global warming,” and it costs more than 10,000 yen, up to what maximum price would you be willing to pay for the wooden table with that label? |
| Q type 2      | Suppose you are shopping online for a wooden table and you find a wooden table that you like (price: 10,000 yen). If there is another wooden table of exactly the same design and quality, bearing the explanation label “We use wood produced under sustainable forest management for the purpose of preserving biodiversity,” and it costs more than 10,000 yen, up to what maximum price would you be willing to pay for the wooden table with that label? |
| Q‘ type 1     | Suppose you are shopping online for a wooden table and you find a wooden table that you like (price: 10,000 yen). If there is a wooden table that is exactly the same as this one, but it has a label that says, “A portion of the sales proceeds will be used for sustainable forest management activities aimed at preventing global warming,” and it costs more than 10,000 yen, up to what maximum price would you be willing to pay for the wooden table with that label? |
| Q‘ type 2     | Suppose you are shopping online for a wooden table and you find a wooden table that you like (price: 10,000 yen). If there is a wooden table that is exactly the same as this one, but it has a label that says, “A portion of the sales proceeds will be used for sustainable forest management activities aimed at preserving biodiversity,” and it costs more than 10,000 yen, up to what maximum price would you be willing to pay for the wooden table with that label? |

The difference between Q and Q‘ is as follows: Q type questions involved situations where wood produced under sustainable forest management is used for the product in question. However, in Q‘ type questions, a portion of the sales proceeds of the product will be used to support sustainable forest management, meaning that a donation for sustainable forest management is included in the selling price.

With regard to the other questions of the survey, which are listed below, the respondents were asked to answer each one (A1)–(A3) on a four-point scale (1: agree–4: disagree):

(A1) □ Do you like wood and wood products?
(A2) □ Do you think it is important to conserve the global environment?
(A3) □ Do you take environmentally friendly actions on a daily basis?

CV is one of the stated preferred methods for assessing such cases, and a number of previous studies have estimated the WTP for environmental, sustainable, or certified products using the stated preferences methods [45–55]; such methods can identify the market premium [56]. With respect to the purpose of this study, consumers appeared ready to pay a small premium for ecological products [57] and to pay a price premium for
furniture made with certified wood products [58–60]. In addition, Kozak et al. [59] found that consumers in Canada were willing to pay a price premium for certified furniture when assuming equivalent quality and design (Quality and Design being very important factors [61]). They found that low price and brand are not important factors [61]. In brief, these previous studies reported WTP estimates for furniture or certified wood products ranging from 1.6–20.8% and WTP for forest conservation between USD 3.17–6.28 [62]. WTP for eco-friendly furniture is influenced by demographic factors [63], and studies indicate that preference for forest management and biodiversity increases depending on the degree of information transfer [64]. Furthermore, WTP for sustainable forest management and supply of forest products were revealed in [65].

Furthermore, using the WTP results from CV, we went on to apply One-Way ANOVA. One-way ANOVA was conducted on consumers’ preference for wooden furniture items and their level of environmental awareness, their WTP for furniture made from wood produced under sustainable forest management, and their WTP for furniture when a portion of the sales proceeds contributed to sustainable forest management.

2.2. Sampling and Data Collection

The survey was conducted by © NTT Com Online Marketing Solutions Corporation [66] using the internet from 17–23 December 2021. The subjects were randomly selected from a sample of 324 Japanese consumers who reported having made purchases on the internet, as this study focused on EC/online shopping. The respondents’ attributes are shown in Table 2. In addition, the range of response times was between seventeen minutes three seconds and eighteen minutes forty-four seconds. The mean response time was seventeen minutes forty-eight seconds.

Table 2. Characteristics of the respondents.

| Characteristics of the Respondents            | n   | %   |
|-----------------------------------------------|-----|-----|
| Total                                         | 324 | 100.0 |
| Male                                          | 217 | 67.0 |
| Female                                        | 107 | 33.0 |
| 10–19 (age)                                   | 0   | 0.0  |
| 20–29                                         | 4   | 1.2  |
| 30–39                                         | 24  | 7.4  |
| 40–49                                         | 68  | 21.0 |
| 50–59                                         | 86  | 26.5 |
| 60–69                                         | 88  | 27.2 |
| 70 and up                                     | 54  | 16.7 |
| Full-time employment                          | 114 | 35.2 |
| Contract/Temporary employment                 | 26  | 8.1  |
| Part-time employment                          | 27  | 8.3  |
| Self-employment                               | 35  | 10.8 |
| No paid work (e.g., housemaker)               | 50  | 15.4 |
| Job-seeking/Pensioner                         | 66  | 20.3 |
| Student                                       | 0   | 0.0  |
| Other                                         | 6   | 1.9  |
| Tokyo (Capital City)                          | 52  | 16.0 |
| Osaka Prefecture                              | 29  | 9.0  |
| Kanagawa Prefecture                           | 43  | 13.3 |
| Aichi Prefecture                              | 13  | 4.0  |
| Hyogo Prefecture                              | 20  | 6.2  |
| Other                                         | 167 | 51.5 |

3. Results

3.1. WTP Results Using CV

First, the results of the questions, excepting CV, were as follows in Table 3. The mean value of the question ‘Do you like wood and wood products?’ was 1.76. The mean value of ‘Do you think it is important to conserve the global environment?’ was 1.52. The mean
value of ‘Do you take environmentally friendly actions on a daily basis?’ was 1.98. Furthermore, the correlation analysis showed that people who like wood and wood products have a high level of environmental awareness (Pearson correlation coefficient = 0.398, \( p < 0.01 \)) and take environmental actions (Pearson correlation coefficient = 0.302, \( p < 0.01 \)). This suggests that whether consumers approve of wood products or not has a certain influence on their environmental awareness and actions. Environmental awareness and actions are among the factors included in the concept of consumer environmental responsibility (CER) [18].

The WTP estimated results adopting CV are provided in Table 4 and include the mean values of the open-ended CV and the bootstrap means from resampling 5000 datapoints.

Table 3. Results of the Attitude Questionnaire: A1–A3.

| (1 = Agree, 4 = Disagree, \( n = 324 \)) | Mean | Standard Deviation |
|-------------------------------------------|------|--------------------|
| A1: Do you like wood and wood products?   | 1.76 | 0.62               |
| A2: Do you think it is important to conserve the global environment? | 1.52 | 0.58               |
| A3: Do you take environmentally friendly actions on a daily basis? | 1.98 | 0.75               |

Table 4. Results of the WTP Estimates using CV: Q and \( \text{Q'} \) types.

| WTP Question | Mean WTP | Bootstrap Mean | C.I. low | C.I. upp |
|--------------|----------|----------------|----------|----------|
| A wooden table made from wood produced under sustainable forest management, particularly for the prevention of global warming (\( \text{Q type 1} \)) | 10,452.5 | 10,492.6 | 10,000 | 15,000 |
| A wooden table made from wood produced under sustainable forest management, particularly for the preservation of biodiversity (\( \text{Q type 2} \)) | 10,430.6 | 10,467.4 | 10,000 | 15,000 |
| A wooden table a portion of the sales proceeds of which will be used for sustainable forest management, particularly for the prevention of global warming (\( \text{Q'} \) type 1) | 10,469.1 | 10,452.8 | 10,000 | 13,000 |
| A wooden table a portion of the sales proceeds of which will be used for sustainable forest management, particularly for the preservation of biodiversity (\( \text{Q'} \) type 2) | 10,422.7 | 10,451.4 | 10,000 | 13,000 |

C.I. = 95\% Confidence Interval (lower/upper bound)

USD1 = Yen (JPY) 125.65 (12 April 2022).

On the whole, the fact that consumers place a premium value on sustainable forest management was confirmed. The results clearly demonstrate the willingness of consumers in Japan to pay a price premium for the environmentally friendly attributes of wood products produced using wood from sustainably managed forests. The WTP premium was found to be about 4\% of the product price. This means that consumers in Japan are willing to pay an additional 4\% of the selling price for the environmental friendliness of wood products, or place that level of value on the environmental attributes of wood products. Moreover, the WTP was highest (JPY 10,469.1) for products when a portion of the sales proceeds were used for sustainable forest management, particularly for the purpose of global warming prevention. It was further confirmed that consumers are willing to pay for eco-friendly furniture [22,36]; that Cai and Aguilar [13] found that estimates of WTP premiums for certified wood products are between 1–39\% in their meta-analysis of previous studies.

3.2. One-Way ANOVA

To analyze the results on WTP, One-way ANOVA was conducted on the items related to liking wood products and WTP for furniture made from wood produced under sustainable forest management, as well as WTP for furniture when a portion of the sales proceeds of which goes to sustainable forest management. The results are shown in Tables 5 and 6.

Table 5. Results of One-way ANOVA (WTP of \( \text{Q type 1} \)).

| A1 * | \( n \) | Mean | Standard Deviation | \( F \)-Value |
|------|--------|------|--------------------|-----------|
| A1−1 (agree) | 109 | 10,782.6 | 1626.7 |          |
| A1−2 | 185 | 10,225.9 | 1288.1 |          |
| A1−3 | 28  | 10,035.7 | 188.9  | 3.63 ** |
| A1−4 (disagree) | 2   | 10,000  | 0      |          |

\( n = 324. * A1 \text{ was according to the Table 3. } ** p < 0.01. \)
Table 6. Results of One-way ANOVA (WTP of Q' type 1).

| A1* | n  | Mean   | Standard Deviation | F-Value |
|-----|----|--------|--------------------|---------|
| A1—1 (agree) | 109 | 10,694.5 | 1539.4 |         |
| A1—2 | 185 | 10,409.7 | 1176.3 |         |
| A1—3 | 28  | 10,017.8 | 94.49  | 2.54**  |
| A1—4 (disagree) | 2   | 10,000  | 0      |         |

\( n = 324, \; * A1 \) was according to the Table 3. ** \( p < 0.01 \).

The results show a significant difference in WTP for furniture made from wood produced under sustainable forest management depending on whether or not consumers liked wood products (Table 6). In other words, there is a difference in WTP based on consumer preferences for wood materials in furniture products. It was found that the more people preferred wood, the higher their WTP for products made from wood produced under sustainable forest management. For example, the average WTP for the group of people who very much preferred wood was JPY 10,794.1, and the average WTP for the group of people who do not was JPY 10,053.6 in Table 7. On the other hand, there was no significant difference in WTP when a portion of the sales profits were used for sustainable forest management (Table 7). For products which saw a portion of the sales proceeds used for sustainable forest management, whether or not a person preferred wood was not particularly relevant. These findings suggest that people who prefer wood are more interested in whether the wood used as raw material was produced under sustainable forest management rather than in actions such as donating towards sustainable forest management.

Table 7. Results of One-way ANOVA (WTP).

| A1* | n  | Mean   | Standard Deviation | F-Value |
|-----|----|--------|--------------------|---------|
| A1—1 (agree) | 109 | 10,794.1 | 1584.4 |         |
| A1—2 | 185 | 10,297.3 | 512.4  |         |
| A1—3 | 28  | 10,053.6 | 333.3  | 7.33**  |
| A1—4 (disagree) | 2   | 10,000  | 0      |         |

| A2* | n  | Mean   | Standard Deviation | F-value |
|-----|----|--------|--------------------|---------|
| A2—1 (agree) | 168 | 10,741.7 | 1584.4 |         |
| A2—2 | 145 | 10,120.3 | 512.4  |         |
| A2—3 | 9   | 10,111.1 | 333.3  | 7.33**  |
| A2—4 (disagree) | 2   | 10,000  | 0      |         |

| A3* | n  | Mean   | Standard Deviation | F-value |
|-----|----|--------|--------------------|---------|
| A3—1 (agree) | 82  | 10,810.4 | 1514.3 |         |
| A3—2 | 177 | 10,398.6 | 1212.7 |         |
| A3—3 | 54  | 10,112.1 | 691.2  | 4.42**  |
| A3—4 (disagree) | 2   | 10,000  | 0      |         |

| Gender | n  | Mean   | Standard Deviation | F-value |
|--------|----|--------|--------------------|---------|
| Male   | 217 | 10,460.4 | 1364.9 |         |
| Female | 107 | 10,403.3 | 904.5  | 0.15    |

| Age    | n  | Mean   | Standard Deviation | F-value |
|--------|----|--------|--------------------|---------|
| 20–29  | 4  | 10,625 | 1250   |         |
| 30–39  | 24 | 10,416.7 | 1167.2 |         |
| 40–49  | 68 | 10,394.1 | 955.7  |         |
| 50–59  | 86 | 10,294.2 | 868.2  |         |
| 60–69  | 88 | 10,544.9 | 1580.4 | 0.52    |
| 70–    | 54 | 10,564.8 | 1473.2 |         |

\( n = 324, \; * A1–A3 \) was according to the Table 3. ** \( p < 0.01 \).

3.3. Influence of Demographic Factors on WTP

Previous studies have reported that characteristics of respondents such as gender and age influence WTP [67–69]. We conducted One-way ANOVA with the attitude questionnaire (A1–A3) and demographic factors such as gender and age. The results of the attitude questionnaire showed that liking wood, having a high level of environmental
awareness, and whether or not people take environmental actions are clearly significant factors. As to demographic factors, there were no significant differences found for either means. Thus, in our study, demographic attributes such as gender and age were found to have no particular effect on the results. This probably indicates that the analysis holds for purchases made on the family level.

4. Discussion and Conclusions

In this study, we sought to quantify the value consumers place on wood products (furniture) made from wood material produced under sustainable forest management as well as the price premium they are willing to pay. Through this study, the following points (1)–(3) were investigated:

(1) To investigate the environmental attributes considered when the consumers purchase wooden furniture;
(2) To understand what factors relating to environmental responsibility consumers are concerned with regarding furniture products;
(3) To reveal consumer behavior from the point of view of quantitative statistical analysis and sustainable forest management.

Regarding the first point above, the selection of materials or resources is an important factor in terms of sustainably designed furniture [28]. The results showed that consumers are willing to pay an additional ~4% of the sales price for wood products made from wood produced under sustainable forest management. In other words, consumers value environmentally friendly wood products. A study by Sakagami and Sakaguchi [13] found a WTP for paper higher than the WTP for furniture found in this study. This indicates that there is a high WTP for frequently purchased wood products such as paper, as well as for wood products with low prices [34,70]. Furthermore, we found that nearly 30% of the respondents have no price premium, which is similar to Ozanne and Vlosky [54]. While certain people are willing to pay higher prices [56], others are only willing to pay the same price as conventional products [21]; this is in keeping with a study by Oblak et al., who found that consumers prefer low prices [30].

Secondly, related to the second point above, it was found that people who have a high level of environmental awareness and people who like wood are more willing to pay for global warming prevention and the preservation of biodiversity. It can be inferred that people who love wood have a high awareness of protecting wood sources, which in turn leads to a high awareness of forest conservation and environmental protection, which in turn then leads to WTP. Vlosky Ozanne and Fontenot [19] found that WTP has a relationship with environmental awareness. Environmental awareness, knowledge, and information [19,71–73] on the part of consumers all influence WTP [22]. Awareness or concerns about the environment are constantly leading to changes in consumer behavior and lifestyles [17].

With respect to the third point above, we analyzed two types of questions, Q and Q’, through CV. Q type questions represent situations where wood produced under sustainable forest management is used for the product in question, while Q’ type questions represent situations where a portion of the sales proceeds of the product are used to support sustainable forest management practices, meaning that while a donation to support sustainable forest management is included in the selling price, the product is not made from wood produced under sustainable forest management. In other words, in the case of Q type questions, the contribution to the conservation of the forest environment has already been made, while in the case of Q’ type questions, the donation is a kind of future investment in the conservation of the forest environment; the difference is that in the latter case the conservation of the forest environment has not yet been achieved at the time of purchase. We found that people who like wood (correlated with environmental awareness, as shown above) are more concerned about whether wood produced under sustainable forest management is actually used as raw material than whether a portion of the sales proceeds are donated towards sustainable forest management, probably because they
consider that forests should be preserved. In other words, they prefer to buy wood products that have already made a contribution to the forest environment. From an economic perspective [74], in such Q type scenarios, the supply curve (private marginal cost) moves upwards (including social marginal costs) and the price is increased, then social optimal equilibrium is realized. Those consumers who have high WTP in Q type scenarios are conscious of social marginal costs such as deforestation, and that it is internalized into the market price. This suggests that direct or certain benefits are important factors in purchasing decision processes regarding sustainable products, as previous studies have implied [23,75,76]. Consumers are often interested in an ecologically friendly product and in the ability to solve certain problems related to its environmental and ecological aspects with the help of the purchased goods [57]. Methodologically, it could be possible to decrease the bias of the open-ended CV using a web-elastic format.

Finally, although there are few such studies on WTP for sustainable wood products in Japan, and this study contributes to the accumulation of WTP studies, there are several limitations that should be noted. This paper focused on wooden tables; hereafter, we intend to investigate other types of furniture and wood-related products in a similar manner. Further, contingent valuation may result in bias because of its reliance on using a hypothetical scenario in the survey process [48,51,77]. Although the discussion in the present study used this method to focus on willingness to pay, in the future we hope to conduct a survey that examines real payments and to conduct a comparison of the results with those for willingness to pay. During the COVID-19 pandemic, we limited the purchases under study to the context of online shopping. However, when purchasing furniture it is often important to see and touch the furniture at a brick-and-mortar store; prior to the COVID-19 pandemic the shopping style of visiting a brick-and-mortar store to see and purchase items first seen on the internet was quite common. In the future, we intend to conduct surveys that include such furniture shopping behavior.

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