

International climbers' behaviour towards the payment of Mount Fuji's Conservation Donation[†]

Raphaelle Delmas¹ and Robin Argueyrolles²

Abstract

235,646 climbers were recorded on Mount Fuji's trail in July and August 2019. While this represents an opportunity for tourism and economic growth, it is also a challenge for the government whose role is to protect Mount Fuji from the by-products of tourism such as litter and environmental degradation, and to ensure the safety of climbers along the trail. With that goal in mind, a voluntary conservation donation system was set up in 2013. This paper investigates how international climber's compliance impacts the collection of the donation. A questionnaire with international climbers was designed using the contingent valuation method and conducted in August 2019. Data was analyzed using descriptive analysis and frequencies as well as a linear regression and non-parametric tests using Stata software. The results suggest that the relatively low payment rate of 60% can be explained by low awareness. Indeed, prior awareness increased compliance with the conservation donation by as much as 19 percent points, pointing to the need of reaching out to international climbers. Furthermore, when the purpose of the donation was explained, the climbers' willingness to pay for a mandatory entrance fee combining the donation and toilet tip was ¥1,544, with 78% of respondents agreeing that entrance should be charged.

Keywords: entrance fee; donation; willingness to pay; compliance; mountain tourism

1. Introduction

The tourism industry, along with the number of outbound tourists, has experienced sustained growth over the last decades, becoming one of the biggest economic sectors in the world. Tourism represents an opportunity for developing as well as developed countries to increase their GDP and attract foreign attention, and many governments have integrated it in their policies. Japan had previously set a

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¹ Graduate School of Asia Pacific Studies, Ritsumeikan Asia Pacific University

² Independent Researcher

target to receive 40 million tourists by 2020 and the Tokyo Olympics (Japan Times, 2018), representing a 25% increase compared to 2018 (JTB Tourism Research & Consulting Co, 2019). National Parks and natural areas are popular tourist destinations, such as Fuji-Hakone-Izu National Park that received 2.58 million foreign visitors in 2017 alone (MoE, 2017, cited in Tanaka, 2017). Mount Fuji, as the most famous mountain in Japan, has been climbed by 235,646 people in 2019 (Kanto Regional Environment Office, 2019). Accordingly, a large body of literature exist on this mountain in relation to the topic of garbage and human waste, restrictions on mountain entry, and cost recovery (Sayama and Nishida, 2001; Kobayashi et al., 2001; Watanabe et al., 2008; Kasai, 2009; Kasai et al., 2009; Ito, 2009; Kitagawa & Watanabe, 2010; Yamamoto & Akiha, 2011).

Mount Fuji is increasingly attracting not only sport mountaineers but rather occasional and even first-time hikers. Other mountains have experience similar trends, such as the mount blanc which sees an increasing number of inexperienced climbers (Kari, 2014). Accordingly, Mount Fuji embodies the trend of increasing popularity of famous summits across the world and its study offers a great potential for research and lessons learned applicable to mountains already in a similar situation or likely to attract many visitors in the future. Focusing on Mount Fuji most popular route, namely the Yoshida trail that concentrated 72% of climbers in 2018, the article seeks to understand how the perception and awareness of international climbers influences their payment of the conservation donation. Based on these results, the ideal price for an entrance fee is determined, as well as the demographic variables affecting willingness to pay.



FIGURE 1. MAP OF TECTONIC PLATES IN JAPAN. (FUJISAN NETWORK, N/D, ONLINE)

2. Literature Review

2.1. Case study presentation

Mount Fuji, the tallest mountain in Japan (3,776 m), stands in between Shizuoka and Yamanashi prefectures. It reached its current shape relatively recently for a volcano, approximately 10,000 years ago. The last eruption recorded was in 1707. Mount Fuji sits on three tectonic plates: the Amurian plate, the Okhotsk plate and the Filipino plate (Fujisan network, n.d.) (see Figure 1). Mount Fuji is situated some 100 km southwest of Tokyo, and easily accessible from the capital by train or bus. Every year it draws many Japanese and foreign climbers or visitors. Mount Fuji is also a sacred site of the Shinto religion and since the introduction of Buddhism in the

sixth century, an important place of worship. Climbing culture emerged in the fourteenth century as Buddhist worshippers established pilgrimage trails leading to the summit. Still to this day, because of its history intertwined with Japanese customs and religions, Fuji is worshipped and an important spiritual symbol in Japan (Polidor, 2007).

Since the fourteenth century and up to today, a consequent number of roads, mountain huts and shops were built on Mount Fuji. Accompanied by safer and well-defined climbing trails, as well governmental coordination and mountain rescue centres, the increasing commodification of the mountain has made it easily accessible for a non-technical day or overnight climb. Notably, the construction of the Fuji-Subaru toll road in 1964, made the 5th station (2300 m) accessible directly by vehicle, reducing the round-trip climbing time (Jones, 2018). Yoshida trail, the most popular of the four trails leading to the summit, has seen its number of climbers multiplied by 2.3 from 1982 to the climbing peak in 2012 (Fujisan Net, 2019).

Counting around 300,000 climbers every year (Kanto Regional Environment Office, 2019), Mount Fuji is one of the most climbed mountains in the world. In recent years, while access to the trail became easier and safer, the climbing profile diversified to include middle-aged and the elderly. Women, who were officially banned from attempting to reach the summit until 1868, also represent a relatively new and developing segment of climbers, as well as foreigners (Kasai, 2009).

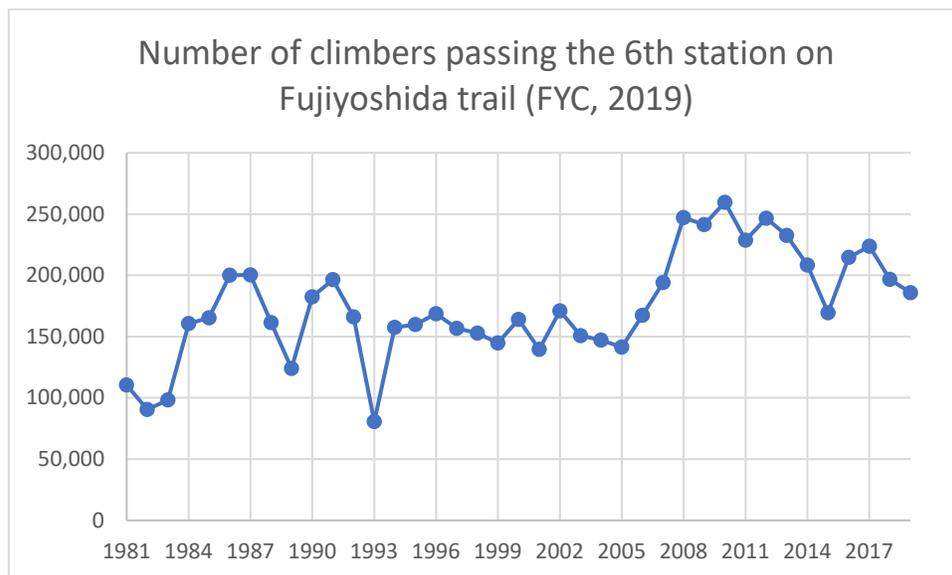


FIGURE 2. NUMBER OF CLIMBERS PASSING THE 6TH STATION COUNTER ON FUJI-YOSHIDA TRAIL, FROM 1981 TO 2019. (FUJIYOSHIDA CITY, 2019, ONLINE)

2.2. Management structure of Mount Fuji

Hiwasaki (2005) explains that in Japan, Natural Parks are managed through a system of zoning and regulation under the Natural Parks Law of 1957. On the contrary to US national parks, where a patch of land is set aside and dedicated to nature conservation, in Japan “natural areas of outstanding scenic beauty in Japan are designated as natural parks” (Nature Conservation Bureau, 2001, p.16), regardless of land ownership or land use. The wording demonstrates the aim for the creation of early natural parks in Japan, that is, recreation and tourism rather than conservation. In Japanese National Parks, private companies own and operate transportation systems and other tourism services, while park management has to compose with private ownership rights and coordination of development. This national park system has been criticized for its lack of effectiveness in conserving biodiversity, its lack of coordination among different government stakeholders and its top-down approach. The amendments made to the Natural Parks Law in 2002 shifted the park management's focus towards the conservation of biodiversity. This resulted in four additional regulations for the conservation of wildlife, namely: the establishment of Utilization Regulation Zones (which limits the number of visitors and their length of stay, by requiring prior reservations and charging a fee up to 1000 Japanese yen), further agreements with landowners, and delegation of park management to local non-profit organisations.

Mount Fuji is a good example of this complex management structure. Designated as a National Park in 1936 and as a special scenic spot in 1952, it is among the first National Parks in Japan, and its ownership is divided between private and national land. Some of its principal landowners are a Buddhist temple complex and the mountain hut association. For this reason, administration by the Ministry of the Environment of Japan is limited with regard to compliance by the many stakeholders involved.

Mount Fuji was one of the first candidates to be enlisted as a Natural World Heritage site in 1992 after Japan ratified the World Heritage convention. However, in 1995 after a visit from UNESCO, the application was aborted at least until Japan would solve the pollution problems degrading Mount Fuji's environment and implement tourism and climbing management strategies. According to Suzuki (2015) and Watanabe et. al (2008), the landscape alteration triggered by the increase in number of climbers and the mismanagement of their wastes was a major factor for the failure of the application. IUCN's feedback also suggested that the geological heritage of Mount Fuji was not exceptional enough to be enlisted as a Natural World Heritage site. The proposal was aborted in 2003, before IUCN's committee could give its final decision. After its withdrawal, the application was revisited to emphasize Fuji's cultural heritage aspects instead (Noguchi, 2014), and was inscribed on the tentative list for Cultural World Heritage Site in 2007. During the same period, citizens and organisations such as the Fujisan Club took action to tackle environmental problems at Mount Fuji through clean-up and

awareness campaigns (Polidor, 2007). The national and prefectural governments also organized joint tourism management plans, such as holistic trail management plans and new trail signs (Jones et al., 2018). Mount Fuji finally became enlisted as a Cultural World Heritage Site in 2013.

After Mount Fuji was inscribed as Cultural Heritage Site in 2013, a conservation donation system was implemented so that climbers can contribute on a voluntary basis a donation with a suggested amount of ¥1000. The donation is received at the entrance of the trail (5th or 6th station) where small stations are set up to call hikers to donate. It is also possible to donate via convenience stores in Japan and internet. According to the Council for the Promotion of the Proper Use of Mt. Fuji (2019), the donation contributes to “help efforts for environmental conservation and enhance climber safety.” The various uses of the money collected are detailed in Annex 1. In their study of factors influencing the payment of the conservation donations, Jones, Yamamoto & Kobayashi (2016) found that 71% of international climbers were unaware of such a donation, compared to 8% of Japanese climbers. The willingness-to-pay of Japanese climbers was 88% while only 50% of international climbers were willing-to-pay, this number climbing to 72% when only considering those who had prior awareness of the donation system. They concluded that prior awareness was a crucial factor for compliance with the donation.

3. Method

This research uses quantitative method to analyse primary data collected by the author from in August and September 2019 at K's House Kawaguchiko (see annex 2), a hostel in Kawaguchiko, Japan, mostly frequented by US and EU's climbers. Kawaguchiko is a city located at the feet of Mount Fuji, main base camp for tourists and climbers seeking to reach the mountain. There are many accommodation options around this area, which is why it was chosen to conduct the survey. The questionnaire in English was available freely at the reception desk and in the lounge where hostel guests filled it out. It was on occasions followed by discussions between the respondents and the researcher to allow for the collection of additional qualitative data and follow-up comments made during the survey. A total of 89 responses were collected. The data collected consists of the respondents' socioeconomic profile; use of the services available at Mount Fuji; payment of the park and toilet fees; and their willingness-to-pay to visit Mount Fuji. The data was entered informatically into Excel and analysed using the latter as well as Stata software.

Prior to a series 'yes' or 'no' iterative bidding questions that concluded on the respondents' final willingness-to-pay at the end of the questionnaire, the climbers were informed in a methodical manner on the ecological problems triggered by tourism and the purpose of preservation at Mount Fuji.

This type of iterative bidding question was used because respondents were inclined to act strategically as they previously had to justify their behaviour regarding the payment of the donation. The following questions were asked to the respondents:

'If there was a NEW entrance fee of ¥1000 per person per day to enter Mt Fuji, replacing the current donation system, would you be willing to pay this fee? Circle Yes or No on the figure below:'

Then either, if answered yes:

'If there was a NEW entrance fee of ¥1500 per person per day to enter Mt Fuji, replacing the current donation system, would you be willing to pay this fee? Circle Yes or No on the figure below:'

Or, if answered no:

'If there was a NEW entrance fee of ¥500 per person per day to enter Mt Fuji, replacing the current donation system, would you be willing to pay this fee? Circle Yes or No on the figure below:'

Then all the respondents were asked this final question:

'What is the highest price you would be willing to pay?'

Following the contingent valuation method question, a control question was asked to all the respondents:

'What is the main / most important REASON that influenced your decision for the HIGHEST price acceptable in Q22?'

It should be noted that similar studies were conducted by Japanese researchers and published in Japanese. They focused mostly on Japanese climbers as questionnaires were distributed in Japanese. If some authors did translate their questionnaires in English, it was a marginal practice, and authors could not speak English and collect valuable data from international climbers. However, international climbers represent a growing segment of climbers at Mount Fuji. This trend of internationalization is not only specific to Mount Fuji but to the overall Japanese tourism sector as well as mountains in other parts of

the world. Thus, we deemed appropriate and important to study international climber's behaviour towards payment of environmental and tourism services.

Many economic valuation techniques exist that measure the value of environmental good and services which do not have a market value which are commonly referred to as non-market valuation methods. Economic valuation techniques help to identify the economic benefits or costs relating to environmental resources and externalities. Hence, the revealed value reflects the price that people are willing to pay in order to obtain a good or service (Nuva et al, 2009). There are indirect pricing methods such the hedonic pricing method, or direct methods also called stated preferences methods. The later consists of a questionnaire approach and includes two main techniques: The contingent valuation method or the choice experiments.

The contingent valuation method first used by Ciriacy-Wantrup in 1947, that includes a set of well-established good practices (OECD, 2018) and which is commonly used when investigating the entrance fee pricing for natural attraction is favoured here in the present study. In addition to simple tabulation and average value calculation, an attempt is made to understand the factors that determine climber's payments patterns by conducting a linear regression and non-parametric tests using Stata. In particular, the explanatory variables explored are awareness of the system (prior to climbing) and the socio-economic profile of the climber.

The fundamental assumption behind the contingent valuation method is that individuals can translate a wide range of environmental criteria into a single monetary amount reflecting the total value of an environmental goods or service. Accordingly, the larger the perceived value for the good is, the higher the willingness to pay for it (White & Lovett, 1999). There exist two approaches for the contingent valuation method. The first relies on asking a willingness-to-pay (WTP) question while the second uses a willingness-to-accept (WTA) question instead. Theoretically, each should produce similar results, but good practice has it that WTP questions should be asked (Arrow et al., 1993), because willingness-to-accept generally gives a more conservative estimate and yields more protest bids. Kahneman et al. (1990) compared willingness to pay and willingness to accept by studying trading behaviour when people participated in a standard market experiment using value tokens, and when the same people participated in market experiment using coffee mugs worth \$6 each. They found that individuals have a strong tendency to remain at the status quo, meaning that the disadvantages of giving up something are larger than the advantages. They also found that giving up something requires a larger compensation than the agent is willing to pay to purchase it, so willingness to accept implies status quo bias and a loss aversion.

The very nature of the contingent valuation method, which is to put a value on a good or service for which the market is not real, has been criticized by researchers to induce a hypothetical bias (Maxwell, 1994). Various other biases and pitfalls have been noted and described in the literature on the topic. By strictly disclosing the same information to all respondents as well as anticipating and monitor the effect of this information on responses, the authors worked to minimize the potential respondents' information bias that stems from the survey-based data gathering strategy used in the present study (Maxwell, 1994). Furthermore, due to the hypothetic nature of the experiment, there is a risk of mental account bias where respondents might fail to consider every variable in their answer such as external financial constraints (Schkade and Payne, 1994) as well as the 'warm glow' effect where can also occur, as stated answers does not compel respondents to actually pay. In other words, climbers might state a higher price that they would in fact be willing to pay for their own moral satisfaction (Kahneman and Knetsch, 1992). Due to these various criticisms, there have been attempts to identify guidelines for the proper design and use of such surveys (e.g. Arrow *et al.*, 1993). To limit as much as possible the effects of these various biases on the present study, the recommendations of the NOAA panel were followed wherever possible in the design of the surveys.

It is also often pointed out by policy makers that there is a discrepancy between the willingness to pay obtained based on hypothetical scenarios compared to real world donation. Moreover, while the rate of collection is almost 100% when passing through a place where the donation is physically enforced, it has been found from actual measurements that the collection rate is only about 30 to 50% when calling for donations, and almost 0% when simply installing a donation box (Yoshida, 2015). In order to eliminate the risks of contesting the results of this research based on the assumption that climbers will adopt a freeloading behaviour, the willingness to pay question was based on a hypothetical mandatory entrance fee for Mount Fuji that would replace both the conservation donation and the toilet tip.

Another shortcoming of this study is that when conducting statistical analysis, the sample size for a study needs to be large enough to provide statistical power. However, mainly due to time and financial constraints, the interviewer could only collect 89 responses for their climber questionnaire. While this number is not extremely significant statistically, it was still considered sufficient to conduct an analysis. To mitigate this limitation, the researcher used both a linear regression analysis and non-parametric tests to allow comparison. Further research based on a larger sample could lead to contrasting findings, as suggested by the results obtained when using a linear regression. It should be noted as well that the questionnaire to the climbers was filled exclusively by international climbers, and that the collection place was a hostel frequented mostly by young travellers (20-30 years old), or families or

older travellers who prefer a hostel environment to that of a more expensive hotel. If other categories of people were included (by requesting to fill surveys on the trail directly for example, or by comparing with climbers sleeping in a more expensive hotel), the trends observed by analysing the questionnaire could yield different results.

4. Results

Since Mount Fuji became a World Heritage Site, a voluntary entrance fee system named “conservation donation” was implemented. A trial was first conducted in 2013 in Yamanashi prefecture to set up a conservation donation on Mt Fuji, and the project was implemented in 2014. According to Yamanashi prefecture (2019), the donation is used to provide information on the value of Mt Fuji as a source of religion and art and to provide environmental protection measures such the construction and renovation of toilets, the expansion of rescue facilities, etc.

Figure 3 displays the payment rate of the conservation donation on Yoshida trail from 2014 to 2018. In 2018, the payment rate of the conservation donation by climbers using the Yoshida trail was around 60%. This number is calculated using the data available on Yamanashi’s prefecture website (2019) crossed with the climbing data retrieved from the Ministry of the Environment of Japan’s website (2019). Hence, the primary data gathered by the author is further validated as the payment rate of 66% closely matches the one derived using the data from Japanese Ministry of Environment. It remains that this payment rate could be much lower considering the findings of Jones, Yang and Yamamoto (2018), that shows that the number of climbers recorded by the Ministry of the Environment of Japan is an underestimate. Nevertheless, this implies that the payment rate considered in the study is an upper bound resulting in conservative estimates of the potential gains from an increase in donations volume. Figure 3. Payment rate of the conservation donation in Yamanashi prefecture from 2014 to 2018 (in %) (Yamanashi prefecture, 2019, online)

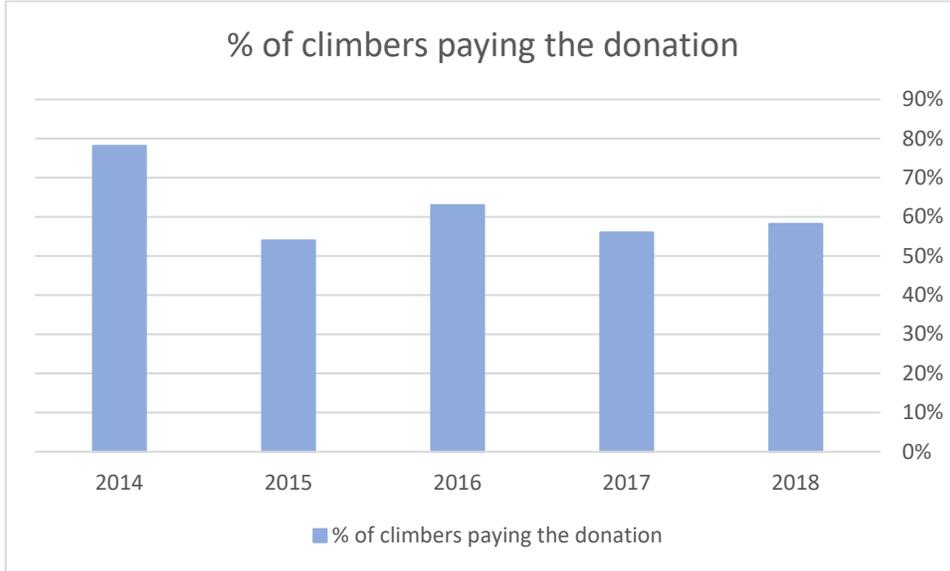


FIGURE 3. PAYMENT RATE OF THE CONSERVATION DONATION IN YAMANASHI PREFECTURE FROM 2014 TO 2018 (IN %). (YAMANASHI PREFECTURE, 2019, ONLINE)

Once again, this is a relatively low payment rate, with 40% of climbers refusing to pay the conservation donation. It is noteworthy to mention once again that most respondents of our questionnaire were from Europe or the US. In the US, there is a mandatory entrance fee to all national parks, which is set from USD7 to USD20, so US visitors should be used to pay to access protected areas (National Park Service, 2020). However, in Europe, the history and processes behind setting protected areas is different than in the US, and entrance fees are much rarer. Most national parks are free to access, although there are recent discussions about setting up entry fees, for example in France (Connexion France, 2020). The reasons why respondents did or did not pay the donation were therefore explored. Each respondent was asked to answer a multiple-choice question exploring reasons why they did or did not give a donation, if applicable. Figure 4 and 5 display all reasons that represented at least 5% of cases. In more than 30% of cases, respondents who paid the donation indicated that they paid because they didn't want to contribute to damaging Mount Fuji and/or because Mount Fuji is World Heritage Site. We can thus argue that the World Heritage label adds perceived value to Mount Fuji, and people become more inclined to pay because they know and trust the World Heritage Site brand. When looking into reasons for people refusal to pay, in almost 25% of cases, the climbers reported not paying because they did not know what the money would be used for. Based on that answer, it can be argued that if they knew about the donation beforehand, or in more details, they would be more willing to accept the payment, which corroborates Jones, Yamamoto and Kobayashi (2016) findings that prior knowledge increases the

payment rate by 22 percent points (from 50% to 72%). Indeed, when comparing the percentage of people that paid the conservation donation amongst people who had prior knowledge of it with the percentage of people that paid the conservation donation amongst people who had no prior knowledge of it, we can see that payment rate increases by 19 percent points (see figure 6).

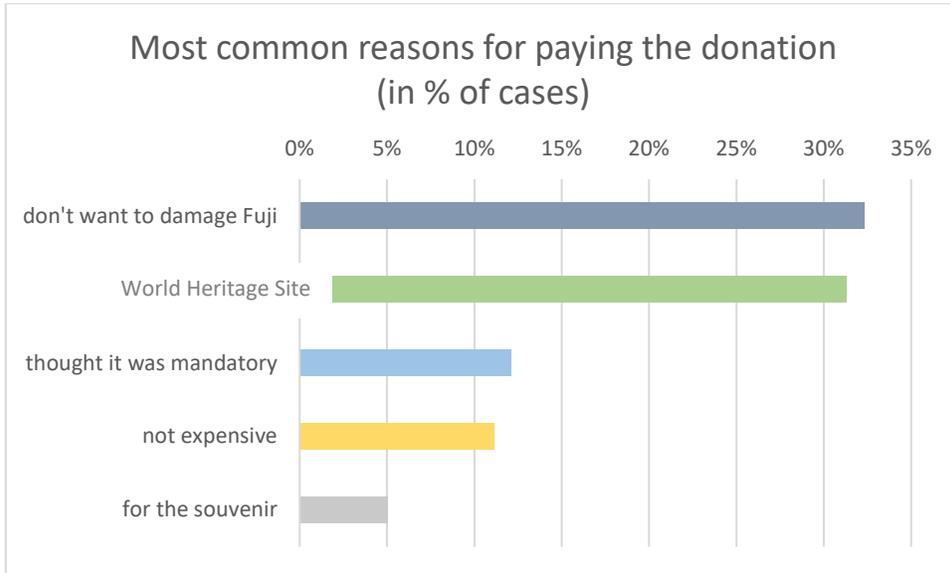


FIGURE 4. REASONS FOR PAYING THE CONSERVATION DONATION (IN % OF CASES).

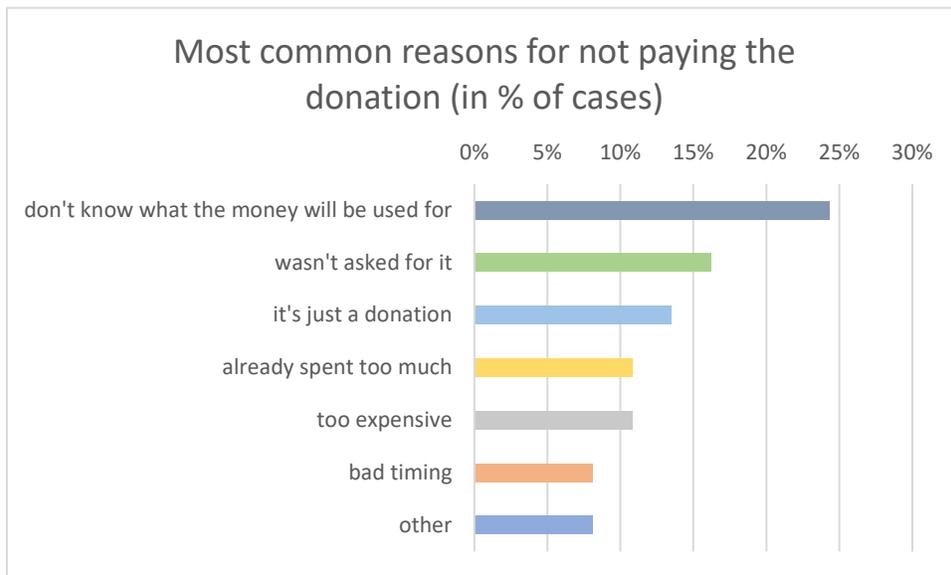


FIGURE 5. REASONS FOR NOT PAYING THE CONSERVATION DONATION (IN % OF CASES).

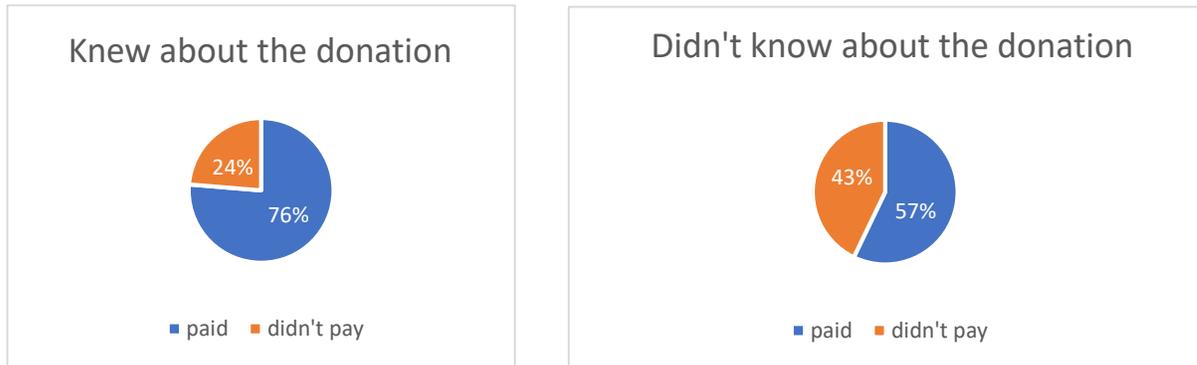


FIGURE 6. PAYMENT RATE OF THE CONSERVATION DONATION ACCORDING TO PRIOR KNOWLEDGE ABOUT THIS PAYMENT SYSTEM.

To evaluate willingness-to-pay of climbers and explore factors influencing their response, we used the economic valuation method as described in the methodology section and ran parametric and non-parametric tests using Stata software. As shown by Figure 7, with a mean willingness to pay of ¥1,544 and a standard deviation of ¥879 the data displays a considerable spread. While a variation in the sample data comes to no surprise considering the size of the variation, what variables have a statistically significant impact on respondent's willingness to pay? In other words, what independent variables hold a significant impact on respondent's willingness to pay (our dependent variable)?

WTP	Freq.
0	1
500	7
700	1
750	1
800	1
1000	27
1100	1
1200	1
1300	1
1500	13
1700	1
1800	1
2000	20
2500	3
3000	4
4000	1
5000	2
TOTAL	86

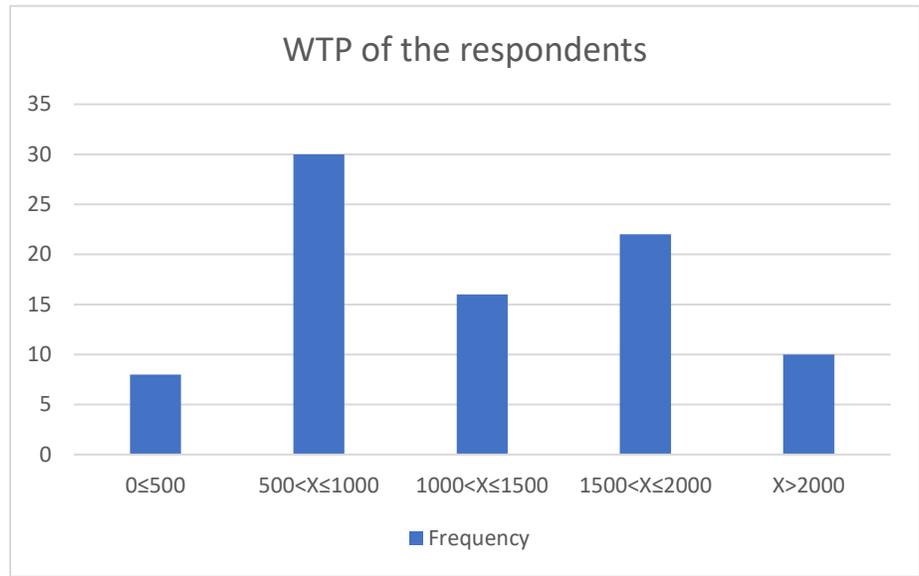


FIGURE 8. SUMMARY OF THE DATA ON RESPONDENT'S WILLINGNESS TO PAY.

Let us consider age, gender, occupation, and income category as our independent variables (see Annex 2 for categories). Based on the linear regression (see Table 1 below or Figure 2 of Annex 3 for more detailed information), we find that at a 5% confidence level, gender ($p=0.015^{**}$) and income category ($p=0.021^{**}$) have a statistically significant effect on the respondents' willingness to pay. More precisely, it appears that female respondents' willingness to pay was about ¥500 higher on average. Furthermore, an increase by one income category results on average in an increase of close to ¥200 in the respondent's willingness to pay. However, noting the regression low R-square, the low number of observations, and the unknown sample distribution, these results must be viewed with skepticism.

TABLE 1. RESULTS OF THE LINEAR REGRESSION.

Dependent Variable	Coefficients
Gender	511.17 ** (0.015)
Income Category	196.72 ** (0.021)
Age	-20.95 (0.116)
Occupation	-35.721 (0.597)
Observations	80

Note: *p<0.1; **p<0.05; ***p<0.01

Taking the statistical significant of the above coefficients and the sample size limitation into consideration, the following investigation focuses on an analysis of genders' impact on WTP using non-parametric tests which need fewer observations and usually make no basic assumptions on the distribution of the data³. Based on the Mann-Whitney U test (Table 2) and its resulting p-value of 0.0247**, we find that with a 5% confidence level we can reject the null hypothesis that the willingness to pay of female and male respondents are the same (or equal). Knowing that the Mann-Whitney U test ranks observations to assess whether two samples are similar (have a similar distribution) by considering the average ranks of the variable observed in the two samples (i.e. correcting for number of observations), we can conclude that the willingness to pay of female and male have a statistically significantly different means. This result is further established by the one-sided Mann-Whitney U test which shows that there exists a larger probability for the female median WTP (0.638) to be greater than that of male respondent. In fact, a simple observation of the data shows, there exist a consistently higher willingness to pay in the female respondent above the 50th percentile (see Figure 1 of Annex 3).

³ No non-parametric test could provide robust analysis of the income category explanatory variable due to the size, spread and nature of the data.

TABLE 2. RESULTS OF THE MANN-WHITNEY U TEST.

Gender	Observations	Rank Sum	Expected
Male	48	1836	2088
Female	38	1905	1653
Combined	86	3741	3741
Adjusted variance	12 595.08		
Z value	-2.245		
Prob > Z	0.0247		
P {WTP (Female) > WTP (Male)} = 0.638			

5. Discussion

The payment rate of the conservation donation is estimated at around 60% both by the primary data gathered as well as the provided by the MoE. This number is similar to the payment rate of 59% found by Yamamoto and Jones (2017). Although Mount Fuji comparatively ranks better than other national parks in Japan where a similar conservation donation is collected, (Yakushima (35-46% collection rate) and Shirakami (30-35% collection rate)), it is still important to investigate the reasons for a low payment rate of both the toilet tip and the conservation donation. To do so, we ought to explore about the motivations of climbers, as well as their understanding of these fees. We found that only 23% of the respondents knew about the conservation donation before starting to climb. However, Jones, Yamamoto & Kobayashi (2016) pointed to the fact that prior awareness was a crucial factor for compliance with the conservation donation. Their finding is corroborated by responses to the author's questionnaire: 24% of respondents who didn't pay the donation declared that one of the reasons was that they didn't know what the money would be used for. Another 22% of respondents mentioned the donation being too expensive or having already spent too much money. This justification shows here again a lack of awareness on the true cost of climbing, and the use made of this money. Furthermore, we found that prior knowledge about the conservation donation increased payment by 19 percent points in our respondents, from 57% to 76%. These findings point toward the necessity to educate climbers and find ways to share more information with them, as their understanding and compliance would be enhanced.

However, the low payment rate translates into poor cost recovery. Kuriyama (2015) already wrote regarding the conservation donation that sufficient money is not collected to achieve the purpose

of the system because the cooperation rate is lower than expected. Currently, even in World Heritage sites, sufficient money to cover fund-raising and personnel expenses for conservation projects are not secured.

With that in mind, it is necessary for the management bodies of Mount Fuji to adapt and design a system that allows the collection of sufficient money from climbers. Efficiently avoiding free riders and improving the collection rate without excessive expenses required for collection is a necessary condition for effectively using the entrance fee of the area (Yoshida, 2015). A solution that has been adopted in national parks across the world, such as the USA, Taiwan, Indonesia etc. is the payment for ecosystem services method. The principle is to charge a fixed amount entrance fee to users or climbers. From the perspective of environmental economics, entry fee collection is expected to have the same effect as the policy mix of environmental taxes and subsidies. In other words, it is possible to both ease congestion by controlling the number of visitors and securing policy costs by increasing income. Although this method is widespread around the world, there are very few cases where an entry fee is collected in Japan (Yoshida, 2015). Examples in Japan include a similar donation to the one at Mount Fuji that is collected in Yakushima and Shirakami because they are both World Heritage Sites, and an environmental conservation tax that is charged in Gifu prefecture. The conservation donation collected at Yakushima was investigated by a few researchers. Yakushima island was designated as a World Heritage site in 1993 and attracts many visitors in May and during the summer vacation in August. Similar to Mount Fuji, the concentrated usage and large number of visitors in Yakushima triggers environmental impacts and the rapid deterioration of mountain trails. Kuriyama and Shoji (2008) studied the impact on visitation when entrance prices are raised. They found that an increase of the entrance price from ¥300 to ¥500 triggers a decrease of 5% of visitors, while an increase of ¥1,000 decreases visitation by 20%. Furthermore, younger visitors and locals (living in the vicinity of the island) are more severely affected by the price increase. A similar study should be conducted for Mount Fuji, but if similar results are found, measures to reduce the weight on younger visitors and locals such as a reduced price or free entrance should be adopted.

To explore the feasibility of such a solution at Mount Fuji, the author asked a willingness-to-pay question to climbers. The entrance fee suggested would include both the conservation donation and toilet tip. The results show that the respondent's mean willingness to pay is greater than the current requested conservation donation fee but that a significant deviation from the mean exist. This suggest that a higher fee could be apply when the use for the donation is salient. Considering that 100% of climbers would have to pay the entrance fee, instead of the 60% currently estimated, the money collected would increase by approximately ¥60,000,000 if the number of climbers stay constant compared to 2018 and the

climbing fee stay fixed at ¥1,000. This figure could be even higher if the climbing fee was above ¥1,000. Furthermore, 78% of respondents think that there should be an entrance fee to Mount Fuji, which shows a considerable understanding towards this solution. Reasons for disagreement mostly pointed towards the fact that “*decreasing accessibility to a natural wonder is [probably not] a morally great idea*” (respondent 20). However, many climbers mentioned that 1000 yen “*is similar to the price of other attractions*” (respondent 17) or mentioned a similar price for national parks in their country, such as respondent 21: “*[it] is around the price to enter national parks in [the] USA and the money goes a long way. People generally don’t mind paying.*”. Furthermore, Suzuki (2015) suggested in his research on Mount Fuji’s World Heritage Site application that if the registration does not involve entry restriction or entry fees, the number of climbers will exceed the capacity of the mountain.

When looking into factors that influence willingness to pay by conducting a statistical analysis, we found that gender seemed to influence WTP, with females being willing to pay ¥500 more yen on average. Income category is also a factor that influences WTP, with an increase of ¥200 on average for each income category. Although income is a factor that influences WTP, its influence on the latter is limited as ¥200 is a quite low increase, when compared to the difference measured between males and females. These findings corroborate previous research using the same method to understand willingness to pay an entrance fee for a national park in India where the authors found that an increase in income translated into an increase in willingness to pay. Furthermore, they also found that female respondents were statistically willing to pay more than male respondents (Bal and Mohanty, 2014). A factor that could explain the discrepancy between stated willingness to pay and actual payment of the conservation donation is the fact that before answering the willingness to pay question, respondents were informed about environmental problems at Mount Fuji and what their money would be used for.

While the contingent valuation method is not without biases (see section 2.4), it was selected for its methodological fit with the analysis topic, and its use is well recognized in scientific literature. As a commonly used method in the literature of the topic, clear guidelines have been established in order to avoid biases and so that the results obtained through willingness to pay questions can be generalized. To yield an accurate approximate of respondents willingness-to-pay, the questionnaire was conducted once climbers were back from climbing and resting in the hostel, giving them plenty of time to think about their answer. A control question was added to have them justify the amount they wrote down. Furthermore, when interviews were conducted, they took place after the respondents filled the questionnaire in order to disclose the same information to all respondents. A critic could be that respondents had already climbed and their answer didn’t engage them to pay the amount they wrote down. In fact, while approximately 40% of respondents didn’t pay the conservation donation, only 1

respondent said they would not pay for an entrance fee. A way to ensure that respondents are not overestimating their willingness to pay would be to distribute the same questionnaire at the place where the donation is collected and compare the result with their actual payment, but this could be seen as a breach of ethical standards and procedures.

6. Conclusion

In conclusion, there is a low compliance from international climbers that translates into a low payment rate. Their awareness of the conservation donation is low, as well their understanding of what the money is used for. Considering that in recent years the climbing profile has changed to include more and more international climbers, it is going to be a necessity to review management policies based on their behaviour. Indeed, our study shows that climbers aware of the systems prior to the climb tend to have a higher compliance, pointing to the need of making more information available to the public. Similarly, when explained where the money would go, 78% of climbers agree that there should be a mandatory entrance fee, and their mean willingness to pay is ¥1,544. If a higher income seems to yield a higher willingness to pay, the influence is still quite limited. However, gender seems to have an influence, as women tend to be willing to pay ¥500 more on average.

This study thereby recommends that the implementation of a mandatory entrance fee that would combine both the conservation donation and the toilet tip be further investigated. Yoshida (2015) suggested that the collection rate was almost 100% when using a park & ride system, and our interview with M. from the Ministry of the Environment of Japan confirmed that fact for the Minami Alps National Park in Japan where a park & ride system is set up. In this national park, a conservation donation of ¥100-200 is included in the price of the bus ticket, and the collection rate is about 99%. Furthermore, considering that the park & ride system is already in place at Mount Fuji, labour and collection costs would be significantly decreased, allowing a bigger proportion of the money collected to be used for conservation, toilets or safety. Whether it is implemented as a park & ride system, as a mandatory internet registration with online payment, or any other automated system, a single entrance fee will yield higher revenue than cash payments and call for donations, and will increase transparency and access to information for all climbers. It is easy to imagine an official website with information accessible in many languages where people can buy their entrance ticket to Mount Fuji. It is also an opportunity to display climbing safety and manners recommendations. The ideal entrance price can be established at ¥1,400 (¥1000 of conservation donation and ¥400 of toilets). Considering that the mean willingness to pay of international climbers for climbing Mount Fuji is ¥1,544, an entrance fee of ¥1,400-¥1,544 would also be accepted by most climbers. Kasai, Saizen and Kobayashi (2009) also found using the same contingent

valuation method that the willingness to pay of Japanese climbers was ¥1,569, confirming our suggested price.

The author used the contingent valuation method to complement the research already conducted by Kasai, Saizen and Kobayashi (2009), and both studies showed to obtain a similar willingness to pay regardless of the nationality of climbers. While this method has limitations, this comparison allows us to consider the results as accurate. We hope that this study can help realize the importance of integrating climbers feedback into management policies and help set a correct price for climbing. Stakeholder interviews however highlighted that the main barrier to the implementation of an entrance fee came from the lack of cooperation between all the actors involved at Mount Fuji. For the adequate implementation of the fee recommended in this article, further research on stakeholder coordination is therefore essential.

Even though this research focuses on Japan and particularly Mount Fuji, the methodology used in this paper can be replicated anywhere in the world, and there are in fact many researchers already using the contingent valuation method to evaluate the willingness to pay of users of national parks around the world (Kamri, 2013 ; Nuva et al., 2009 ; Samdin, 2008). It is interesting to use this methodology not only for national parks, but for climbing specific mountains, as the overcrowding issues are becoming prevalent not only on Mount Fuji, but also on other summits, such as Mount Everest (Man Singh et al., 2019) or Mont Blanc (Jones, 2019).

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Annexes

Annex 1 (Council for the Promotion of the Proper Use of Mt. Fuji (2019). Fujisan Conservation Donation Campaign. Retrieved on: http://www.fujisan-climb.jp/en/manner/conservation_donation.html)

The use of collected donation

Collected donations will be used to introduce and enhance activities and services for environmental conservation, climber safety and information provision related to climbing Mt. Fuji at and above the 5th Stations. Please have a look at listed projects below that will be covered by this donation.

1. **Environmental conservation**

- Installing temporary toilet facilities
- Research and examination of new technologies to be introduced into toilet system for mountain huts
- Installing signage to raise awareness of climbing etiquette and rules

“Fujisan Conservation Donation” WILL NOT be used to maintain toilet facilities, including those installed in mountain huts. To support the maintenance of these facilities, climbers are asked to pay a small fee(200-300yen) when using the toilet.

2. **Climber safety**

- Increasing the safety of the down trails. (e.g. Repair of protective fences, Installing a voice guidance system at a junction)
- Assigning guides to provide safety and route directions
- Setting up first-aid centers
- Operation of the Safety Guidance Center
- Conducting climber trend surveys

3. **Information provision**

- Setting up information centers
- Improvement of the General Administration Center
- Operation of on-site safety headquarters

Annex 2 – Climber's questionnaire

Survey : help us make a cleaner Mt. Fuji		Time: ____ : ____ .
Hello! I'm a Masters student from Ritsumeikan APU in Beppu, Oita. Please help with my research		2019 AUG/SEPT ____ .
Part 1. Please tell us about yourself		
1) AGE: _____ years		2) GENDER: _____
3) NATIONALITY: _____		4) CURRENT RESIDENCE: _____ / _____ ※ (country/city)
5) What is your current EMPLOYMENT status?		
<input type="checkbox"/> employed full time (40 or more hours per week) <input type="checkbox"/> employed part time (up to 39 hours per week) <input type="checkbox"/> unemployed <input type="checkbox"/> student <input type="checkbox"/> retired <input type="checkbox"/> homemaker <input type="checkbox"/> self-employed <input type="checkbox"/> unable to work <input type="checkbox"/> other: _____		
6) Which of these best describes your PERSONAL INCOME last year? ※ (¥100 ≈ \$1US ≈ €0.90 euro)		
<input type="checkbox"/> <\$4,000 <input type="checkbox"/> \$4,000-\$9,999 <input type="checkbox"/> \$10,000-\$24,999 <input type="checkbox"/> \$25,000-\$49,999 <input type="checkbox"/> \$50,000-\$79,999 <input type="checkbox"/> ≥\$80,000		
7) Are you living in Japan LONG-TERM (≥3 months) or staying here SHORT-TERM (≤3 months)?		
<input type="checkbox"/> long-term: I've lived in Japan for ____ years ____ months <input type="checkbox"/> short-term: I'm staying in Japan for ____ months ____ days		
Part 2. About your Mt Fuji climbing trip		
8a) How did you travel to/from Mt Fuji? <input type="checkbox"/> private car <input type="checkbox"/> rentacar <input type="checkbox"/> train <input type="checkbox"/> bus <input type="checkbox"/> other: _____		
8b) Did you arrange the Fuji trip INDEPENDENTLY or did you join an organized TOUR? How much did it cost (※per person)?		
<input type="checkbox"/> I arranged the trip independently → altogether it cost ¥ _____ (※total inc. transport/mtn hut etc) <input type="checkbox"/> I joined an organized tour → the tour cost ¥ _____ (※per person)?		
8c) How about other costs/money spent while climbing? (※only include money spent at/above the 5 th station)		
Food & drinks cost ¥ _____ Souvenir/gifts cost ¥ _____ Other things bought cost ¥ _____		
9) How many people are in your GROUP? _____ ※ (including yourself but NOT including guide/climbers not travelling with you)		
10) How many people are in your group by GENDER? No. of Male: _____ Female: _____ Other: _____		
11) Who are your COMPANIONS? (※check ALL appropriate answers) <input type="checkbox"/> travelling alone <input type="checkbox"/> husband/wife/ <input type="checkbox"/> partner <input type="checkbox"/> family <input type="checkbox"/> friend(s) <input type="checkbox"/> co-worker(s) <input type="checkbox"/> other: _____		
12) WHY did you decide to climb Mt Fuji? Why did you climb with these COMPANIONS? _____ _____ _____		
13a) Did you stay in a mountain hut? <input type="checkbox"/> Yes, I stayed in a hut <input type="checkbox"/> Yes, I paid to rest in a hut <input type="checkbox"/> No, I didn't use the huts		
13b) Did you climb to the TOP of Mt. Fuji? <input type="checkbox"/> Yes, I reached the top → what time did you arrive on top? _____ <input type="checkbox"/> No, I turned around/abandoned climbing at the ____ station because _____ e.g. bad weather ; I was cold /tired etc.		
14) What is your overall SATISFACTION with the climbing experience? (please circle ONE number to indicate satisfaction) ※ (1 = unsatisfied ⇔ 5 = very satisfied) -> Comment/REASON for (dis)/satisfaction (e.g. : toilets, sunrise, crowding, trail...) 1 - 2 - 3 - 4 - 5 _____		
15) Would you be likely to RECOMMEND climbing Fuji to a friend? 1 - 2 - 3 - 4 - 5 (1 = v. unlikely ⇔ 5 = v. likely)		
Part 3. About Mt Fuji's toilets		
16) Did you use the TOILETS when you climbed Mt Fuji? ※ (NOT including the toilets below the 5 th station)		
<input type="checkbox"/> Yes, I used the toilets ____ times <input type="checkbox"/> No, I didn't use the toilets because _____ -> go to Q19)		
IF YES	17) Did you use the toilet situated on the descending trail at the 7th station? ※ please see the Map	
	<input type="checkbox"/> Yes, I used that toilet on the way down <input type="checkbox"/> No, I did not use that toilet on the way down -> go to 19)	
	18a) Did you pay a TIP to use the toilets?	
	<input type="checkbox"/> Yes, I paid ¥ _____ -> go to 19) <input type="checkbox"/> No, I did not pay a tip	
IF NO (did not pay tip)	18b) Why did you NOT pay? I did not pay a tip for the toilet because... ※ choose all relevant answers	
	<input type="checkbox"/> ... I don't know what the money will be used for <input type="checkbox"/> ... because it's just a tip <input type="checkbox"/> ... it's too expensive <input type="checkbox"/> ... the toilets were not clean <input type="checkbox"/> ... I didn't have cash/exact change <input type="checkbox"/> ...other: _____	
	19) Did you know that there are BIO-TOILETS that decompose human excreta on Mt Fuji? <input type="checkbox"/> No, I didn't know about the	
	<input type="checkbox"/> Yes, I knew -> from? <input type="checkbox"/> official website <input type="checkbox"/> travel website <input type="checkbox"/> poster <input type="checkbox"/> friends/word of mouth <input type="checkbox"/> other: _____	
	20) During your climb, did you ever urinate outside (i.e. open air, not in the toilet)?	
	<input type="checkbox"/> Yes, because _____ <input type="checkbox"/> No, never	
		NOW PLEASE TURN OVER →

PART 4. About conservation of Mt Fuji

Since 2013, a ¥1000 donation is asked from all climbers at the 5th station to contribute to the conservation of Mt Fuji.

20) Did you already know about the ¥1000 donation BEFORE climbing Mt Fuji? No, I didn't know about it before climbing
 Yes, I already knew about the donation -> from? website friends/word of mouth other: _____

21a) Did you pay the donation on this climb? Yes, I paid the ¥1000 donation No, I didn't pay the ¥1000 donation

IF YES	21b) Why did you pay? I paid the ¥1000 donation because... ※ choose all relevant answers <input type="checkbox"/> ... I don't want to damage Mt Fuji <input type="checkbox"/> ... Mt Fuji is a world heritage site <input type="checkbox"/> ... it's not expensive <input type="checkbox"/> ... I thought it was mandatory/must pay <input type="checkbox"/> ... other reason: _____
IF NO	21c) Why did you NOT pay? I did NOT pay the ¥1000 donation because... ※ choose all relevant answers <input type="checkbox"/> ... I don't know what the money will be used for <input type="checkbox"/> ... it's just a donation <input type="checkbox"/> ... it's too expensive <input type="checkbox"/> ... because I didn't have cash /exact money <input type="checkbox"/> ...other reason: _____

READ CAREFULLY THE FOLLOWING TEXT:

Mount Fuji provides not only beautiful landscape but is also important for other reasons:

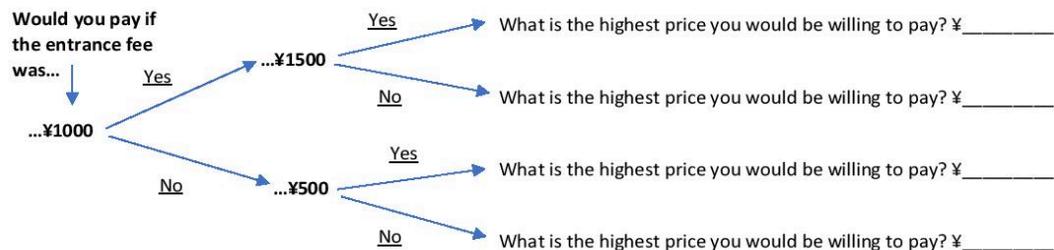
- provides protection for plants & animals • clear water • forest which helps maintain soils quality and sequesters CO2
- important cultural landmark listed as UNESCO world cultural heritage site in 2013 • generates income from tourism

However, it was not managed carefully due to a lack of financial resources, e.g. quantities of **trash** could be found on/around Mt Fuji; everyday **bulldozers** climb up and down; **excreta & toilet paper** called "white rivers" were directly flushed down the side of the mountain.

In 2002, the Ministry of Environment subsidized a new program to install **toilets** (including bio-toilets) on Mt Fuji. They are effective in reducing environmental impacts such as contamination of soil and contamination of groundwater. However, due to high maintenance costs, some of them are not used anymore and it is likely that in a few years they will be discontinued.

In order to protect Mt Fuji, one solution is to set up an **entrance fee**. The money will be used **for conservation of Mt Fuji only**: cleaning up the trash; maintenance of the bio-toilets; holding environmental education programs for visitors and climbers. The fee would be collected from all climbers at the 5th station. The fee would be **mandatory**, replacing the current system (optional donation). All toilets will also become **free** of charge.

22) If there was a NEW entrance fee of ¥1000 per person per day to enter Mt Fuji, replacing the current donation system, would you be willing to pay this fee? Circle Yes or No on the figure below:-



23) Do you agree that Mt Fuji should have an entrance fee or a limit on the maximum number of climbers? ※ choose ONE!

- Yes, Mt Fuji should have an entrance fee
- Yes, Mt Fuji should have a limit on the maximum number of climbers
- Yes, Mt Fuji should have an entrance fee AND a limit on the maximum number of climbers
- No, Mt Fuji should NOT have an entrance fee OR a limit on the maximum number of climbers

24) What is the main / most important REASON that influenced your decision for the HIGHEST price acceptable in Q22?

▲ ===== End of the survey. Thank you for your help. We will use for research purposes only. Have a safe trip ===== ▲

Annex 3 – Statistical tests made on Stata

WTP					
Percentiles		Smallest			
1%	0	0			
5%	500	500			
10%	700	500	Obs		86
25%	1000	500	Sum of Wgt.		86
50%	1500		Mean		1544.767
		Largest	Std. Dev.		879.1048
75%	2000	3000			
90%	2500	4000	Variance		772825.2
95%	3000	5000	Skewness		1.680039
99%	5000	5000	Kurtosis		7.182346

ANNEX FIGURE 1. SUMMARY OF THE DATA ON RESPONDENT'S WTP.

Source	SS	df	MS			
Model	7447823.61	4	1861955.9	Number of obs =	80	
Residual	56120645.1	75	748275.269	F(4, 75) =	2.49	
Total	63568468.8	79	804664.161	Prob > F =	0.0504	
				R-squared =	0.1172	
				Adj R-squared =	0.0701	
				Root MSE =	865.03	

wtp	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
age	-20.95265	13.18992	-1.59	0.116	-47.22831	5.323017
gender	511.1733	204.6617	2.50	0.015	103.4663	918.8802
occu	-35.72352	67.30954	-0.53	0.597	-169.811	98.36395
inccat	196.7013	83.10151	2.37	0.021	31.15464	362.248
_cons	878.6381	383.2783	2.29	0.025	115.1085	1642.168

ANNEX FIGURE 2. LINEAR REGRESSION.

Variable	Observations	Mean	Std. Dev.	Min	Max
Male WTP	48	1369.79	808.44	0	5000
Female WTP	38	1765.78	924.81	500	5000

ANNEX FIGURE 3. SUMMARY OF THE DATA ON GENDER AND WTP.

Panel A. Males

	Percentiles	Smallest		
1%	0	0		
5%	500	500		
10%	500	500	Obs	48
25%	1000	500	Sum of Wgt.	48
50%	1000		Mean	1369.792
		Largest	Std. Dev.	808.4487
75%	1850	2500		
90%	2000	2500	Variance	653589.3
95%	2500	3000	Skewness	2.02774
99%	5000	5000	Kurtosis	9.78312

Panel B. Females

WTP				
	Percentiles	Smallest		
1%	500	500		
5%	500	500		
10%	1000	800	Obs	38
25%	1000	1000	Sum of Wgt.	38
50%	1650		Mean	1765.789
		Largest	Std. Dev.	924.8159
75%	2000	3000		
90%	3000	3000	Variance	855284.5
95%	4000	4000	Skewness	1.440939
99%	5000	5000	Kurtosis	5.73325

ANNEX FIGURE 4. DISTRIBUTION OF WTP BY GENDER.