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WeChat - Using social media for the assessment of tourist preferences for environmental improvements in China

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Abstract:

Environmental valuation studies with tourists have been very popular already over a long period of time. Tourists are an important stakeholder group with respect to the decision if some environmental project in a tourist region should be realized or not. Typically such studies are organized as face-to-face surveys conducted in the respective vacation areas. Tourists are asked their willingness to pay (e.g. in terms of higher entrance fees for certain amenities on site or a mark-up on accommodation prices etc.) for the implementation of an environmental project or preservation measure in that area. Based on theoretical considerations we argue that in the special case of tourist surveys internet-based surveys are preferable to face-to-face surveys under validity aspects as well as under the aspect of the representativeness of the survey results. Based on an empirical valuation study we conducted in Southwest China we illustrate the practical problems arising in the context of internet surveys in developing or threshold countries.

Keywords: Environmental valuation, reforestation, Contingent Valuation Method, internet surveys, tourist preferences, China

JEL Classification: D6, H4, Q23, Q51

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1. Introduction

The value of environmental quality and of the enhancement of environmental amenities in tourist areas is of considerable importance to local governments and to tourism managers in such regions. They are typically interested in increasing the number of tourists visiting their area. To reach this goal they try to make their tourist site more attractive. One possibility to do that is to invest public money in projects enhancing environmental quality though no specific payments are made by tourists for this improvement. This makes sense only if such environmental projects contribute to the overall satisfaction or utility of tourists to a considerable extent. Therefore, it is interesting for local tourism managers to collect information on tourists' awareness of environmental quality in their region and their appreciation of certain environmental improvements. This information can be used to allocate budgetary resources to those public projects that are indeed worthwhile implementing and to develop financing mechanisms for sustainable tourism. This is why studies aiming at the assessment of tourists' preferences for environmental improvements have been so popular for a long time already (s. e.g. Hudson et al. 2001, Schep et al. 2012, Schuhmann et al. 2017 or Peng 2017).

In this paper, we are interested in the appraisal of the benefits accruing from environmental projects in tourist areas and, as a specific aspect in this context, in the assessment of tourists' preferences for environmental amendments. The typical procedure here is to interview tourists face-to-face on site during one or more fixed time intervals (see e.g. Chen et al. 2017, Van Berkel and Verburg 2014, Wang and Jia, 2012, Ji et al. 2018 and others). Based on theoretical considerations, we will argue in favour of employing online interviews for tourist surveys instead, though we are well aware of the problems connected with this interview form. We will use an empirical example of a tourist survey, a Contingent Valuation survey conducted in Southwest China, to illustrate the usefulness of online surveys with tourists.

The paper is organized as follows: Section 2 will describe theoretical considerations with regard to environmental valuation surveys with tourists. The underlying empirical study will be outlined in Section 3 and the respective results will be presented in Section 4. Section 5 concludes the paper.

2. Environmental valuation surveys with tourists - theoretical considerations

When assessing the benefits accruing to tourists from an environmental improvement one has to be aware of the fact that environmental projects typically create two different kinds of values, use values and nonuse values. By use values we understand the benefits individuals obtain from a direct and observable utilization of an environmental good like hiking in a forest, swimming in a lake etc. Especially in an environmental context, also the so-called nonuse values play an important role. Nonuse values or nonuse benefits affect the wellbeing of individuals without being connected to any observable utilization activity. Instead, they "arise from a pure concern for the preservation of an environmental asset for no reason other than maintaining the existence of that asset." (Shechter and Freeman 1994, p. 172). The motivation for the "pure concern for the preservation of an environmental asset" might originate in altruistic feelings towards future generations, so that the "environmental asset" has a so-called bequest value for

them. People might also want this environmental asset to be preserved in order to keep the option to use it sometime in the future, e.g. visiting a beautiful natural landscape after their retirement when they will have enough time. Of course, people might also be just proud of living in a country with a healthy and beautiful environment, no matter if they utilize it personally or not. For them a sound environment has a pure existence value. The independence of nonuse values of observable utilization activities makes it impossible to assess them by applying so-called revealed preference assessment methods like the Travel Cost Method or the Hedonic Price Method (Bennett, 2011) which are based on the observation of utilization activities by individuals. For a comprehensive assessment of environmental goods or projects, stated preference methods like the Contingent Valuation Method or Discrete Choice Experiments must be employed. Only these methods are suited for the assessment of the total value of environmental goods or projects, which equals the sum of their use and nonuse value (cf. e.g. Randall 1991, p. 304).

It is apparent that for a comprehensive appraisal of the benefits accruing from an environmental project to tourists in a certain area it is not enough to assess the benefits of those tourists who are accidentally on site during an interview campaign but to consider also former tourists who have been there already earlier. Nonuse values will be received (at least potentially) by all actual and former tourists on the respective site, while use values will be obtained only by those who intend to visit the project site again after the completion of the environmental project. These considerations show that it is not easy to clearly define and identify the target population of the stakeholder group "tourists" in a concrete project appraisal study. If the target population is not clearly defined and identifiable, it is hardly possible to draw a representative sample from this group for a valuation study.⁵ This will be especially difficult with on-site surveys conducted during more or less arbitrarily chosen time spans. By definition, a representative sample is a subset of a statistical population that closely matches the characteristics of that population, i.e. its characteristics accurately reflect those of the larger population from which it is drawn. If the target population, i.e. the sampling frame, is not well-defined the distribution of the relevant (e.g. demographic) characteristics within this group is not known and then a matching distribution of these characteristics within the chosen sample cannot be ensured. In this case the choice of a statistically meaningful and representative sample in a strict sense is highly problematic. In spite of these problems, environmental valuation studies with tourists are very popular and can frequently be found in the valuation literature as mentioned before. In most of these studies, the question of identifying the correct target population is not discussed.

The typical approach chosen in tourist surveys is to interview tourists on site in a face-to-face manner during a certain time interval (see e.g. Chen et al. 2017, Van Berkel and Verburg 2014, Wang and Jia, 2012, Ji et al. 2018, Schuhmann et al. 2017 and many others). This procedure is problematic for several reasons. One reason is, as explained above, that with this kind of sampling one gets only a more or less arbitrary snapshot of those tourists' preferences who are accidentally on site during the time interval in which the interviews are conducted, while all other tourists who have visited the site in previous years and whose judgement is as important as that

⁵ Of course, in long-established tourist regions with a well-functioning tourism management the necessary data might be available from routine data collection from tourists over many years in the past. However, our suggestions here aim at the assessment of tourist preferences in newly created tourist areas in developing or emerging countries like our study site in Southwest China.

of present tourists are disregarded. Therefore, the results gained from such a survey cannot be representative of all tourists' preferences since the larger part of the target population is not covered by the survey. The problem that the size and socio-demographic composition of a target population is not known is not only typical of tourist surveys, but it is also familiar from surveys with other hard-to-reach or hard-to-identify population groups. In such cases auxiliary sampling methods like Time-Location Sampling, Snowballing or the Capture-Recapture method are applied in practice. A good overview over these methods is provided by Marpsat and Razafindratsima (2010). Unfortunately, these methods do not offer a solution to our problem of on-site valuation surveys with tourists, since the necessary requirement for their validity, i.e. that all members of the target population have the same probability to be selected for the sample, is obviously not fulfilled here. Instead, only a small and arbitrary subset of all tourists is eligible for interviews during an on-site interview campaign.

Besides this sampling or representativeness problem there is also a validity problem arising from the chosen interview procedure. In on-site tourist surveys tourists are typically "caught" when visiting some tourist attraction like e.g. at the entrance of a national park or some other tourist site (s. e.g. Van Berkel and Verburg 2014 or Wang et al. 2012). At such points people have other things on their minds than answering questionnaires. They are in the beginning or in the middle of a day full of activities and excitements so that they will not have the nerve to consider the different questions of the interview thoroughly. This problem is known from street intercept interviews, but it is even more severe if people are intercepted during their touristic sightseeing program. Interviewing group tourists travelling in buses will be even more problematic since these people are under the time regimen of the group program. Therefore, they will be pressed by the other group members to be quick in order not to delay the whole program. For group tourists the probability is high that they will influence each other when answering the questions. They might also be afraid that their answers will be overheard and judged by other group members and adjust their answers accordingly. Therefore, it is very unlikely that under such circumstances researchers obtain the well-conceived and independent answers to their questions that they want. This will, of course, impair the validity of the survey results.

In this context another shortcoming of interviewing tourists during their visit to the project site should not be neglected. They are caught at a point in time when only a part of their holidays is over so that their impressions are based only on this part. The remaining part of their holidays, which is still lying before them and which will possibly influence their overall assessment of their vacation in the end does not enter their judgement of environmental improvements in such "midterm" interviews. In order to obtain a comprehensive picture of their preferences regarding environmental improvements in the respective region they should be interviewed after the end of their holidays. Only then, their judgements will be based on the total experience of their holidays. Then they will have had enough time to let their impressions of their holidays sink in and to form their own opinion on the situation at the project site. In the middle of a holiday preferences are formed under the actual impressions gained over the past days and might be influenced by factors which are irrelevant for the valuation of the environmental project in question (like. e.g. the quality of the food they got, the atmosphere among the members of their travel group, the quality of their hotel or the personality of the group leader etc.). After some time will have passed after the end of their holidays their judgements regarding the whole journey and the environmental project in their travel region will be more balanced and more

carefully thought out. These considerations also put into question the validity of the results of on-site surveys.

It is also clear that only after the end of their holidays and under the impression of their whole holiday experience, tourists will be able to make reliable statements regarding their intention to visit their vacation site again. This decision is important for their valuation of a possible environmental improvement in this region since only those tourists who intend to come again to the site in the future will expect not only nonuse values but also use values from environmental improvements on that site. In the middle of their holidays, many of the tourists might not yet have decided if they will come back in the future or not. Therefore, they are prone to understate their WTP since they do not consider the use values accruing to them in case they come back.

Another important disadvantage of face-to-face interviews is that they are very costly, since interviewers have to be trained, transported to the survey site and paid for their work, food accommodation etc. Also the on-site organization of such a survey will be very costly. The cost argument is especially important if the project site is far away from the institution where the researchers are located who carry out the valuation study. This could be even another continent like in our case where the project site was in China while we are stationed in Europe. In such a case the transaction cost of conducting a valuation study on site can easily reach an amount that makes the prospective results of such a valuation study not worth its cost.

Summing up, we conclude that the traditional way of assessing tourists' preferences for environmental amendments in vacation areas by conducting interviews on site does not lead to useful results since

- the interviewed tourist sample is an arbitrarily chosen subsample of the whole target population, i.e. of all tourists (former and present) to the respective region, which will not be representative of the target population,
- respondents are interviewed "on the fly" between different holiday activities so that they are in a hurry and their answers will not be as deliberate as they should be,
- most of them do not yet know in the middle of their holidays if they will come back and enjoy use values from the environmental project in question or not,
- carrying out face-to-face interviews on site are typically very costly.

An obvious alternative to personal interviews on site would be an online survey with former, actual and also future tourists in the region in question. Online surveys can be organized from everywhere, i.e. no costly trips to the surveyed tourist region are necessary. Further, no interviewers are needed which reduces the survey cost dramatically in comparison to face-to-face surveys (no expenses for interviewer training, interviewer transport to the survey site and back, interviewer accommodation, meals, wages etc.). Therefore, online surveys incur lower costs, financially as well as administratively (Menegaki et al., 2016).

An important advantage regarding the validity of the survey results is the fact that with an online survey we do not get an arbitrary snapshot of the preferences of those tourists who are by chance on site when the interviews are carried out. Instead, one can capture also the preferences of former tourists from many previous years. Differently from actual tourists these interviewees have already completed their holidays, so that they have got a comprehensive picture of the

region and its problems which makes their judgments more dependable than those of actual tourists caught in the middle of their holidays. They also had time to "digest" their holiday impressions so that their judgments are more deliberate, i.e. less spontaneous and impulsive, than those collected from tourists on site. Further, they are not exposed to the influence of and interaction with other tourists or tourist guides.

Of course, we are well aware of the various weaknesses of online surveys in comparison with face-to-face interviews. It is often mentioned that face-to-face surveys bear the advantage of lower non-response rates than with mail surveys. It is also held that in a face-to-face interview one can present more complex information using visual support such as photos, maps and alike. Another disadvantage of online surveys as compared to face-to-face surveys is that the whole process of filling in the questionnaire cannot be controlled. We do not know in which order respondents answer the questions (unless we deny them a "return" option in the online questionnaire) and we do not know if they are distracted by other people in the room or by the radio or TV running while they answer our questions. We do not know if they fill in the questionnaire without interruption in one go and if they do so without discussing our questions with other people. In a face-to-face survey these problems do not occur and, additionally, the interviewer might be able to assess how well a respondent has understood the general context of the study and the elicitation scenario (Marta-Pedroso et al., 2007). On the other hand, an interviewer bias might occur if respondents react to the gender or personality of an interviewer or if they have a tendency to socially desired or politically correct answering. Further, they might feel under time pressure if the interviewer is waiting for their answer while they would need more time to consider the questions more thoroughly. In an online survey, on the other hand, respondents find the privacy and time necessary to assess the questions and their respective answers adequately.

An often mentioned weakness of online surveys is that they may suffer from a sample selection bias since respondents can select themselves into the sample, which affects the sample's representativeness (see also Menegaki et al. 2016). Especially, early internet studies had the problem that participants were more likely to be male and younger than the average population. However, this problem has been reduced with the more widespread use of computers across all generations. Menegaki et al. desirable responding (see also Lee et al. 2016). This generally positive evaluation of internet surveys is shared by Lindhjem and Navrud (2011), who argue that "internet interviews may well provide a reliable, low-cost alternative to [face-to-face] interviews" (p. 1635). Lee et al. (2016) argue in the same vein, claiming that "the internet is a viable communication mode especially when one considers the costs of the different modes from design to data analysis" (p. 41).

For all these reasons we believe that online surveys with tourists are an attractive alternative to on-site interviews with tourists not only under cost aspects but also under validity aspects in this special case. The superiority of face-to-face interviews over online interviews that is typically taken for granted in general does not hold here, if we consider the specific circumstances under which face-to-face interviews with tourists are carried out on site.

In the empirical study underlying this paper we want to test the practical performance of an online Contingent Valuation survey. As an example of a valuation object we chose a reforestation project in Xishuangbanna in Southwest China. We wanted to assess the appreciation of this

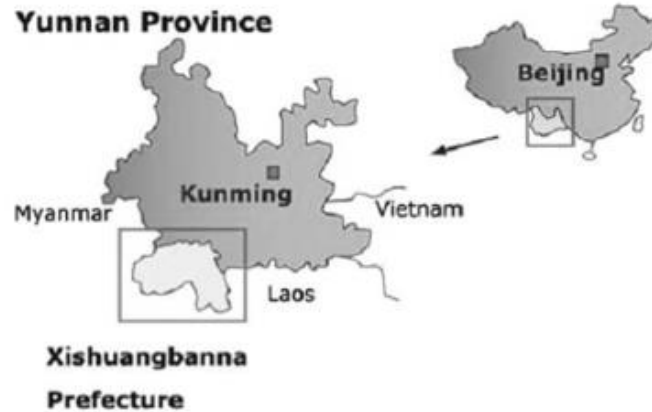
project by tourists visiting this region and their willingness to pay (WTP) for its realization. It would be very costly for a European university to carry out such a valuation study with tourists on site. Therefore, it seemed worthwhile to use an online survey as a kind of "remote-sensing" valuation technique here and to scrutinize the practical implementation problems that might occur in this context. As a typical threshold country with a strong and rather authoritarian government China is not an easy region for surveys, no matter if online or in-person. We wanted to find out about the political and administrative obstacles occurring under such circumstances and the usefulness of the results gained from such a study for local tourism planners and tourism administration. This study will be described in detail in the subsequent section of this paper.

3. The empirical study

3.1 *A reforestation project in Xishuangbanna*

The object to be valued in our online Contingent Valuation study with tourists was a hypothetical reforestation project in the Xishuangbanna Dai Autonomous Prefecture in the province of Yunnan in Southwest China (see Fig. 1⁶). This rehabilitation project had already been the object of study in an interdisciplinary Sino-German research project called "Sustainable rubber cultivation in the Mekong Region (SURUMER)" (<https://surumer.uni-hohenheim.de/en/90683>). Therefore, the project features were well known and the project scenario to be valued in our online survey, sustainable rubber plantation and reforestation in Xishuangbanna (XB), was realistic and credible for respondents. Xishuangbanna with its tropical rainforest is famous all over China as a unique biodiversity hotspot. Unfortunately, over the past decades the cultivation of rubber trees on former forestland has caused deforestation at a large scale. Rubber plantations have been encroaching the rainforest from all sides leading to the impairment of rare and valuable ecosystems and a dramatic loss of biodiversity and ecosystem services in this region. The ecosystem services provided by the natural rainforest in Xishuangbanna comprise among other things the provision of food, fresh water, feed for livestock, wood for construction and cooking, the regulation of the microclimate in the region and the provision of habitat for rare animals and plants. For tourists it provides a most beautiful landscape and offers many possibilities for recreation, hiking, animal spotting, but also for activities like biking or rafting. The natural rainforest is of great cultural importance for some of the ethnic groups living in Xishuangbanna. These different kinds of ecosystem services are endangered by the rapid expansion of rubber plantations leading to a dramatic reduction of the area covered with rainforest.

⁶ Figure taken from Ahlheim et al. (2015), p. 2.

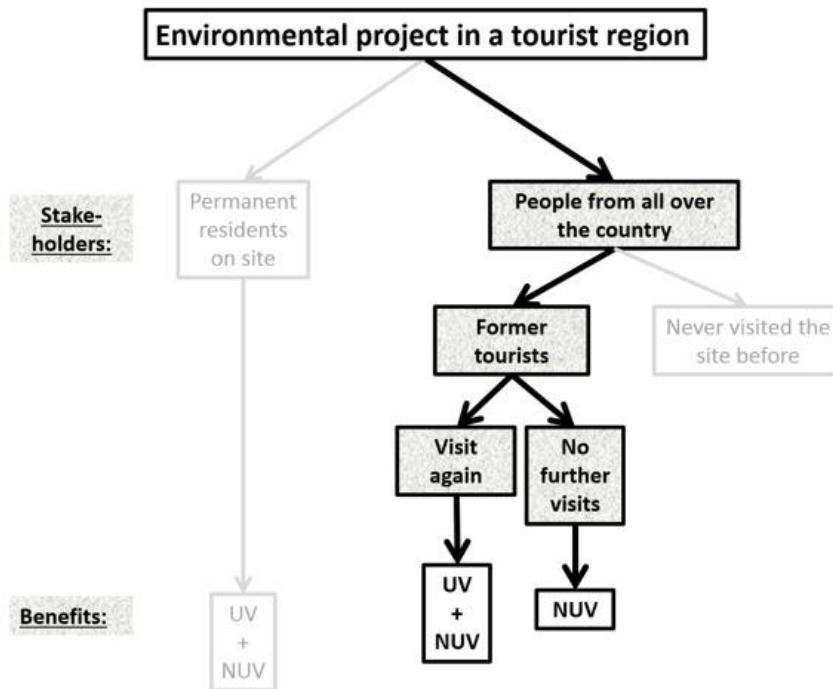


– Figure 1: Xishuangbanna Dai Autonomous Prefecture –

In the CVM scenario offered for valuation in our survey we suggested a reforestation program called the "Preserve Xishuangbanna" (PX) program which aimed at a (partial) restoration of the original ecosystems and ecosystem services provided by rainforests in that region (cf. Ahlheim et al. 2015). Such reforestation efforts would enhance the provision of forest-related ecosystem services not only for the present generation, but also and especially for future generations. That means that from such a program not only use benefits, which accrue only to people on site, but also nonuse benefits, which accrue also to people living far away from Xishuangbanna, can be expected. Especially in an environmental context, such nonuse benefits like existence values or bequest values regarding future generations play an important role. In our Contingent Valuation study, we wanted to assess the use and nonuse benefits accruing to former and future tourists in Xishuangbanna in terms of their willingness to pay (WTP) for the realization of the PX project. Further, we wanted to identify the determinants of their WTP and to elicit additional information from tourists, which could be of value for tourism managers and local government officials.

3.2 Sampling strategy

In January and February 2017, we conducted an online CVM survey with former XB tourists in order to assess the overall benefits accruing to tourists from the suggested reforestation program "Preserve Xishuangbanna" (PX). Figure 2 shows our target population in comparison to the overall population of all beneficiaries of the "Preserve Xishuangbanna" project. As shown in figure 2 our target population consisted of people from all over the country who had been to Xishuangbanna as tourists before. They all would potentially enjoy the nonuse value (NUV in figure 2) of the planned reforestation project, while those of them who want to come back one day might also be able to benefit from its use value (UV).



- Figure 2: Target population of the online survey and benefit categories –

Our main concern regarding the sampling process was, as already mentioned above, that in the case of a tourist survey the target population is not as well-defined and clearly outlined like e.g. the residents of a town or a country. We do not know ex ante who belongs to the population of former tourists in Xishuangbanna and, therefore, we do not know the distribution of the main socio-demographic characteristics among this population, so that stratified or quota sampling is problematic in a tourist survey. As explained above, the usual sampling methods recommended for cases where the target population cannot be identified ex ante cannot be applied here since the requirements for the validity of these methods (see e.g. Marpsat and Razafindratsima, 2010) are not fulfilled.

Besides the problem of dealing with a not well-defined target population, we faced the problem of identifying and contacting former tourists who had visited Xishuangbanna before. The Chinese panel service providers were not able to offer contact to these persons since they did not have the necessary information on the travel habits of their clients. Therefore, we had to think of suitable methods to track former XB tourists and to recruit them as respondents for our survey. For this purpose, we targeted website users who were supposed to have visited Xishuangbanna because they were sharing travel guides, personal experience, photos etc. of Xishuangbanna on travel-sites, online forums and photo-sharing sites. We addressed the respective users by sending out personal messages via those websites, inviting them to participate in the survey. In total, eight websites were selected as questionnaire promotion channels, namely the travel-sites Mafengwo, Qyer and Yododo; the online forums Douban, Sina Weibo and Zhihu; as well as the

photo-sharing sites Fengniao and Yupoo. Detailed information regarding target groups and remarks on the websites is shown in the appendix.

In order to be able to contact website users directly we created a so-called WeChat account named SURUMER2017. WeChat is the leading multi-functional messaging software in China that has over 800 million active users (Tencent, 2016), and is widely used for many purposes including instant messaging and also money transfer (WeChat pay). This latter function of WeChat was important for us since we wanted to compensate respondents of our survey for their time by granting them a small money amount (10 RMB \approx 1.58 US dollars) and, of course, we also wanted to create an incentive to participate. We used SURUMER2017 as our working account for transferring so-called "Red Envelopes" containing 10 RMB each via WeChat pay to the participants of our survey. Participants could reach SURUMER2017 by searching the account code on WeChat, or by scanning the quick response code (QR code) attached to the end of the questionnaire. They were required to send a screenshot of the last page of our questionnaire to SURUMER2017, in order to prove that they had successfully completed the questionnaire. After confirmation, a 10 RMB Red Envelope would be sent to them via WeChat pay.

The most important advantage of addressing the users of such travel websites personally was that we could identify former tourists of Xishuangbanna reliably. The fact that they were contributing to websites focussing on Xishuangbanna and on travels to that region was proof enough for us to assume that they had been there, indeed. A disadvantage of addressing people on websites like travel-sites, online forums or photo-sharing sites was that people do not use them as instant communication platforms, so that it took some time before they visited the website again and noticed our messages. Therefore, answers to our requests came in with a certain delay. With this sampling mode, i.e. contacting users of Xishuangbanna-related websites directly on these websites, we were able to collect a total number of 300 completed questionnaires, with 266 Red Envelopes sent out to the respondents. Unfortunately, we had to change our sampling strategy after some time because many of the websites we used had a control system on advertising or activity promotion by private users. These automatic control systems identified us – wrongly – as breaking the rules by conducting illegal advertising activities and, consequently, excluded us from using their websites. For instance, websites including Mafengwo, Yododo and Sina Weibo had upper limits for the number of personal messages that could be sent per day. These limits ranged from 3 to 15 messages per day. Websites such as Qyer could detect questionnaire promotion messages automatically and delete them and on websites such as Douban we were reported to the webmaster for "doing personal advertisements". Consequently, our account was blocked permanently. We tried to contact several website managers and webmasters in order to start a cooperation with them for our survey but we never got an answer. Therefore, eventually we had to give up this sampling mode and switch to a new strategy.

We then decided to try to identify former Xishuangbanna tourists in respective chat groups on WeChat and QQ, two of the most popular messaging services in China. Instead of contacting individual participants of such groups, we promoted our survey in two Yunnan-related WeChat tourist chatting groups with over 200 members in each group and in three QQ tourist chat groups with over 50 members per group. The "Yunnan Tourism" WeChat group for example was a public group with open access to all WeChat users. We found the access QR code of the WeChat group

on www.weixinqun.com ("WeChat group.com"). After scanning the QR code with a mobile WeChat scanner, a request of joining the group was sent to the group-master.

The most important advantage of promoting questionnaires via an instant messaging software was the high efficiency in recruiting respondents. With the help of this instant messaging software, messages could be spread very fast among its users and thus a great number of responses to our request to participate in our survey came in very fast. Another advantage was that, compared with the travel-sites, online forums and photo-sharing sites used in the first phase of the survey, WeChat and QQ have way more active users, which makes them a rich source of potential survey participants. However, reversing the recruiting direction, i.e. being contacted by WeChat participants who had found our announcement in their chat group instead of recruiting them actively on the relevant websites, opened up the opportunity to fraud. We were surprised that the promised reward of 10 RMB worth 1.58 US dollars per completed interview obviously provided an incentive to cheat. Since the promotion messages were published in chat groups, it was not really possible to check if the voluntary survey participants were real tourists of Xishuangbanna or not. Group members could forward the promotion message to their friends or to other groups if the incentive, i.e. the 10 RMB Red Envelope, sounded attractive to them. As a tool for the detection of fraudsters we developed the following heuristic rules:

- Pay attention to the small details shown at the upper edges of the screenshots, such as the remaining capacity of battery, mobile operator, time, background software, etc., which make each screenshot unique. If these details are the same for two different questionnaires handed in for reward, kick them out.
- Compare the time when a respondent requests the Red Envelope with the time shown on his/her screenshot. In general, the time at that the respondent requests the Red Envelope should be only slightly later than the time shown on the screenshot. If the time difference is big, fraud might be involved.
- Pay attention to the image quality of the screenshot. As most of the messaging services degrade/compress images automatically when they are being sent, the quality of a screenshot deteriorates every time it is sent.

Another strategy to detect fraudsters could be to ask catch questions on the last page of the questionnaire. Respondents could, for example, be asked to tick in a list the tourist attractions they have visited in their vacation area. Some of the attractions shown in the list would, of course, not exist in the respective region so that cheaters could be identified if they ticked these items.

Summing up, the sampling strategy of addressing potential respondents directly via travel websites turned out to be not viable because our e-mails to the users of the respective websites were interpreted as commercial advertising and eliminated, so that this recruiting strategy cannot be recommended. Therefore, we will focus on the analysis of the data obtained from the second recruiting strategy, i.e. posting the questionnaire in travel chat groups of WeChat and QQ, which can be used in practice also in the future.

4. Survey results

The second phase of our survey yielded 457 completed online questionnaires from respondents with socioeconomic characteristics according to table 1. The average age of our respondents was approximately 30 years (with a standard deviation of 8.8 years) which is slightly lower than the average age of all Chinese people which was 37 years in 2015 (Statista, 2018). Since very old people do not travel much in China (only 0.22% of our respondents were older than 65 years) it seems plausible that the age pattern of our respondents according to table 1 is more or less representative of the overall group of tourists. That means that if there is an age bias towards younger people as is often suspected in the case of online surveys, it is rather small. Total average disposable income of our respondents' households (gross income minus taxes and social security payments) was approximately 84,000 RMB which is rather high for China. So it is no wonder that 51% of the respondents judged their economic situation to be "better in comparison with the average Chinese household". The average number of children was 1.2 children per household, which is plausible considering China's One-Child-Policy. More detailed information on the descriptive statistics of our survey can be gathered from table 1.

All our respondents had been to Xishuangbanna at least once, nearly 35% of them had been there twice and 28% of all respondents had been there three and more times. This shows that our recruiting strategy led us to respondents who had already collected enough experience with the project in order to give competent answers to our questions. When looking at the average time respondents had stayed in Xishuangbanna, we found that 30.63% of them had stayed there 2-4 days and 57.33% had stayed for 5-7 days, the rest had stayed longer. The median expenditure for their trip to Xishuangbanna had been 6,000 RMB. Nearly all respondents (97%) stated that their trip was worth the money they had spent. It was interesting that 64% of respondents had supported environmental projects financially before. This is a strong indicator that tourists coming to Xishuangbanna are engaged in environmental matters. All this information might be of high interest for tourism managers and local government officials if they want to make Xishuangbanna even more attractive for tourists coming to Xishuangbanna.

On average, respondents needed 9 minutes and 27 seconds to answer the questionnaire. The quickest respondent needed only 2 minutes and 18 seconds, while the slowest respondent needed 27 minutes and 5 seconds. Respondents came from 28 Chinese provinces. There is no apparent bias towards a specific province. The most frequently named provinces were Hebei (11.79%), Guangxi (11.14%), Hunan (8.30%), Henan (7.21%) and Beijing (6.11%). 91.61% of the respondents were Han, with other minorities present being Man, Zhuang, Hui, Yao, Dai, Tujia, Bai, Hani and Meng (all less than 2%). It is clear that it would rarely have been possible to capture such a variety of respondent backgrounds in an on-site survey. It is interesting to note that most respondents filled out the questionnaire using a mobile device. 79.87% used an Android-based smartphone or tablet computer, and 15.97% used either an iPhone or an iPad. Only 4.16% used a traditional PC. It might be due to the political situation in China that 45% of our respondents stated that when answering our questions they had explicitly considered the possibility that their answers "could be used against me in other matters", while 36% had not considered this possibility but found it important when asked. That means that 81% of our respondents did not really believe in the anonymity of our survey. Consequently, the possibility cannot be excluded that part of the answers to our questions were biased towards political correctness and willingness to please.

Gender	Share	Age	Share
Female	56.02 %	18-25	38.29 %
Male	43.98 %	26-35	39.61 %
		36-45	16.63 %
		46-55	4.16 %
		56-65	1.09 %
		Over 65	0.22 %
		No answer	0.00 %
Education	Share	Annual Income	Share
Not graduated	0.22 %	< 10 000 RMB	5.69 %
Primary School	0.22 %	10 000 – 29 999 RMB	15.75 %
Junior High	5.69 %	30 000 – 49 999 RMB	16.63 %
Senior High	19.91 %	50 000 – 99 999 RMB	19.47 %
College	23.85 %	100 000 – 149 999 RMB	17.51 %
Bachelor	44.64 %	150 000 – 199 999 RMB	12.47 %
Master	5.47 %	200 000 – 249 999 RMB	5.91 %
No answer	0.00 %	250 000 – 299 999 RMB	4.60 %
		More than 300 000 RMB	1.97 %
		No answer	0.00 %

– Table 1: Descriptive statistics of the sample –

Turning to the environmental aspects of our survey we learned that 95% of our respondents had heard of the rubber cultivation in Xishuangbanna and approximately 70% had also heard of the environmental problems connected with rubber cultivation. An astonishingly high share of 62% had already visited a rubber plantation personally. These statements of our respondents make it

seem plausible that the answers we obtained in our survey were competent and experience-based.

When we asked respondents to tick in a list the three items that fascinated them most about Xishuangbanna we obtained the answers stated in table 2. Obviously, tourists were especially enchanted by the beautiful landscape of Xishuangbanna and its pristine nature.

What fascinated you most about Xishuangbanna?	Rank (Share %)
Landscape beauty	1 (65.65 %)
Pristine nature	2 (55.14 %)
Variety of ethnic minorities	3 (29.54 %)
Kindness of local people	4 (26.91 %)
Cultural heritage sites	5 (21.88 %)
Variety of food	6 (19.91 %)
Local climate	7 (19.47 %)
Clean air	8 (17.50 %)
Local festivals	9 (10.94 %)
Slow pace of living	10 (9.85 %)
Local shopping options	11 (5.47 %)
Less cars and traffic	12 (4.38 %)

– Table 2: Fascinating things in Xishuangbanna –

In a short text we informed respondents on the various ecosystem services provided by a rainforest and then we asked them to rank these ecosystem services according to their importance (*"Could you please rank the items stated below according to their importance from your perspective with 1 being "Least important" and 9 being "Most important"?"*). The results are shown in table 3. It is plausible that typical provisional ecosystem services (provision of medicinal plants and raw materials) appear to be least important to tourists since they do not benefit from them directly. From table 3 it follows that tourists appreciate most the local climate and the air quality, followed by fresh water and the provision of habitat for species. Interestingly, the item "Recreation and Tourism" ranks only 6th which might indicate that a further development and

intensification of tourism and man-made tourist attractions might not be a good idea in Xishuangbanna. Obviously, the results shown in tables 2 and 3 are of great interest for tourism managers as well as local politicians when considering a further development of their region. From these results they may learn, for example, that the natural values of Xishuangbanna are rated much higher by tourists than manmade attractions like "Local festivals" or "Local shopping options". Therefore, sustainable tourism should be their main goal and the preservation of nature should be their highest priority if they want Xishuangbanna to prosper as an attractive tourist destination.

Ecosystem Service	Rank (Average Rank)
Local Climate and Air Quality	1 (5.89)
Fresh Water Provision	2 (5.78)
Habitats for Species	3 (5.44)
Erosion Prevention and Soil Fertility	4 (5.39)
Food Provision	5 (4.94)
Recreation and Tourism	6 (4.41)
Spiritual Experience	7 (4.40)
Medicinal Resource Provision	8a (4.37)
Raw Material Provision	8b (4.37)

– **Table 3: Ranking of ecosystem services** –

After this ranking task we described the main characteristics of the suggested "Preserve Xishuangbanna" project in a short text and then told respondents that in order to realize this project, financial sacrifices will have to be made by them: "In order to finance these transfer payments government would have to impose a surcharge on the value-added tax. This would lead to higher commodity prices. Thus, the proposed program would increase also your household's monthly expenditures." Then we asked them if they were willing to support this project, in principle, by accepting an increase in their monthly expenditures. A large majority of 89% of our respondents agreed to such a sacrifice. Then we showed them a payment card ranging

from "2 RMB" to "More than 200 RMB" and asked them to tick "... the maximum increase of monthly expenditure your household would be willing to tolerate in order to get the program realized". This yielded us a mean willingness to pay of 65.07 RMB (\approx 10.24 US dollars) per month. For tourism managers it might be interesting which items trigger tourists' WTP for environmental improvement, i.e. which tourist groups would benefit most from the PX program. After the variables' description in order of appearance in table 4, the results of the respective regression analysis are shown in table 5.

Variable	Description	Mean	S.D.
FEMALE	Indicates if a respondent is female (1 = yes, 0 = no)	0.563	-
INCOME	Level of income (between 0 RMB and 400,000 RMB)	83,407 RMB	79,961 RMB
EDUC	Level of education (scale from 1 to 7)	5.226	1.049
AGE	Age of respondent	29.908	8.752
SEEN RUBBER	Indicates if respondent has visited a rubber plantation before (1 = yes, 0 = no)	0.620	-
TIME SPENT	Time spent in XB in days	7.967	11.659
VISIT AGAIN	Indicates if respondent plans to visit XB again (1 = yes, 0 = no)	0.888	-
PROTEST	Dummy for respondents completely agreeing with the protest questions	0.044	-
DOUBT	Dummy for respondents having doubts in the effectiveness of the PX program	0.075	-
POLITICAL	Dummy for respondents considering political issues when answering the survey	0.259	-

– Table 4: Description of variables used in the regression models (in order of appearance) –

Variable	Coefficient	Std. error	Significance (p-value)
CONSTANT	-47.152**	21.537	0.029
FEMALE	5.845	5.874	0.320
INCOME	0.281***	0.040	0.000
EDUC	6.523**	2.885	0.024
AGE	0.343	0.364	0.347
SEEN RUBBER	13.943**	6.340	0.028
TIME SPENT	-0.056	0.264	0.831
VISIT AGAIN	26.666***	9.471	0.005
PROTEST	11.628	17.614	0.509
DOUBT	0.327	13.861	0.981
POLITICAL	31.555***	6.978	0.000
Observations	455		
Adjusted R-squared	0.2257		

***, **, * mean statistical significance at 1 %, 5 % and 10 %, respectively

– Table 5: Determinants of WTP –

The dependent variable here is respondents' WTP for the PX project. From table 5 it can be seen that household income, respondents' level of education, their political attitude and their previous knowledge on the rubber problem in Xishuangbanna have a significantly positive influence on respondents' WTP for the project. The independent variable "political" in table 5 is a composite variable gained from factor analysis which comprises respondents who had considered "The Thirteenth Five-Year Plan", "The chances that my answers in this questionnaire could be used against me in other matters" and the political goal of "Building a new socialist countryside" when answering the WTP question. This result shows that tourists' WTP for environmental improvements might be triggered not only by their love of nature but also by their political consciousness and their sense of political duty. However, it is not clear if this political correctness is truthful or only pretended. In combination with the before-mentioned finding that a great part of respondents doubts the anonymity of the survey it is quite possible that the positive effect of a "correct" political consciousness (thinking of "The Thirteenth Five-Year Plan" and the political

goal of "Building a new socialist countryside") on stated WTP is triggered by the fear of personal consequences or politically "wrong" answers ("The chances that my answers in this questionnaire could be used against me in other matters").

It is also interesting to see that the plan to come back to XB as tourists increases respondents' WTP. This is plausible in the light of our earlier argument that only tourists who will return to the project site will have the chance to reap not only nonuse benefits but also use benefits from the PX project in the future. This should, of course, increase their WTP for the project. Our regression analysis draws a rather clear and plausible picture of those types of tourists who attach the highest importance to environmental improvements and reforestation in Xishuangbanna: Their high appreciation of the reforestation project is triggered either by a high income or a high educational level, a good previous knowledge of the rubber problem in Xishuangbanna, a strong sense of political duty or by the decision to return to Xishuangbanna as tourists in the future. Each of these characteristics alone or a combination of them may cause an increase in the stated WTP of the respective respondents as an indicator of the benefits they expect from the suggested reforestation program.

5. Concluding remarks

Environmental valuation surveys with tourists are rather popular since they generate valuable information for tourism managers and local government officials who want to enhance the attractiveness of their area as a vacation region. Tourism managers learn from these surveys what tourists appreciate most in their region, what their expectations are and how much they would value environmental improvements in the respective region. Most of these studies are conducted as on-site surveys where tourists are addressed randomly during their vacation and interviewed in a face-to-face manner. This on-site sampling strategy has the disadvantage that only an arbitrary subsample of all tourists visiting this site is interviewed (i.e. people who are accidentally on site when the survey is conducted), while the genuine target population would be all tourists having visited the respective area. Another disadvantage is that respondents of such interviews are still in the middle of their holidays so that their impressions of their vacation area and their assessment of the situation there are still incomplete. They had also had no time to let their impressions sink in and draw well-considered conclusions regarding the attractiveness of further environmental improvements in that region. The usually named advantages of face-to-face interviews over internet surveys regarding the validity of survey results are not convincing here, at least not in their majority, since tourists are typically caught at the beginning of or during some activity (visiting a tourist attraction, entering a boat for a tour, going to dinner etc.) where they have other things on their minds than answering survey questions regarding the importance of environmental improvements which need deeper consideration. Therefore, we suggest conducting online surveys with former tourists of a certain vacation site. Their holidays are over and they had enough time to think about their experience on site and draw well-considered conclusions. They are also not pressed to hurry up by fellow tourists or tour guides but can take their time to think thoroughly about the questions asked. Therefore, one can expect answers of higher quality and validity than with face-to-face surveys on the fly between two tourist activities. After the end of their vacation interviewees will also know if they intend to return to the region in question again as tourists or not. This is especially important for Contingent Valuation surveys

where respondents are asked their willingness to pay for environmental improvements on site, since only if they want to come back they will have the chance to enjoy also use values and not only nonuse values from an additional environmental amenity. An important practical advantage of online surveys as compared to face-to-face surveys on site is that they are much less costly. This is especially important if researchers are located in a region far away from the study site so that it would be very expensive to send interviewers there, give them a thorough training and compensate them for all their expenses. A "remote valuation" study organised via internet is easier to handle, quicker and less expensive.

We illustrated the practical performance of an online Contingent Valuation survey using the example of an assessment of the benefits accruing to tourists from a reforestation project in Xishuangbanna in Southwest China. We found that sampling is rather difficult in an emerging country like China where often no previous information on the socio-demographic characteristics of the target population is available to researchers. Therefore, stratified or quota sampling is difficult under such circumstances. It also turned out to be a problem to identify and contact previous tourists to Xishuangbanna since commercial panel service suppliers did not have the necessary information on people's vacation habits. Therefore, we had to find a pragmatic way of contacting potential interviewees via travel chat groups. In our online interviews, we were able to collect valuable information on the socio-demographic characteristics of tourists having visited Xishuangbanna and on their willingness to contribute financially to the realization of a reforestation project in that region. We learned about tourists' preferences regarding the different touristic highlights and the ecosystem services accruing from the tropical rainforest in Xishuangbanna they appreciated most. All this information is of considerable value to tourism managers if they want to enhance the attractiveness of their region. It was also interesting to learn that many respondents of our survey were concerned regarding the anonymity of the survey and feared negative consequences in case they gave answers which might appear politically incorrect. Such "politically-desired responding" behavior where respondents anticipate the answers politicians might want to hear impairs the validity of the results of a study. Therefore, it is important to test for such political correctness effects and to eliminate the respective respondents from the survey sample.

As a conclusion from our theoretical considerations as well as from our empirical study, we strongly support the idea of conducting online surveys for the assessment of the benefits accruing to tourists from environmental improvements on tourist sites. However, more research has to be done on the improvement of online survey results with tourists and on finding better sampling techniques for tourist surveys in developing and threshold countries on the internet.

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Appendix: Travel websites used to identify and contact former XB tourists

Platforms	Name of the website	The target group	Remarks
Travel-sites	Mafengwo 马蜂窝 http://www.mafengwo.cn/	<ul style="list-style-type: none"> - users who posted/shared travel guides or experiences about Xishuangbanna; - users who rated/commented on hotels in Xishuangbanna; 	Maximum 5 personal messages per day can be sent to strangers, and maximum 7 messages per day can be left on “Message Board” of each user’s profile page without entering captcha codes. However, our Mafengwo account was blocked after several days, under the suspicion of delivering advertisements.
	Qyer 穷游网 http://www.qyer.com/	<ul style="list-style-type: none"> - users who posted/shared travel guides or experiences about Xishuangbanna; 	There was no limitation on the amount of personal messages one could send in one day. However, after sending over a hundred personal messages, we received a system message from the webmaster stating that all of the messages we sent had been deleted automatically, as personal questionnaire promotion was not allowed, and if needed, we could contact the Qyer webmaster for help. Therefore, we sent a cooperation request to the Qyer webmaster on 12 th Jan. 2017. However, we have not received any reply so far.
	Yododo 游多多 http://www.yododo.com/	<ul style="list-style-type: none"> - users who posted/shared travel guides or experiences about Xishuangbanna; 	For newly registered Yododo members, a limitation of maximum 3 personal messages can be sent per day to strangers.
Online forums	Douban 豆瓣网 https://www.douban.com/	<ul style="list-style-type: none"> - users who were in the Douban Groups that related with Xishuangbanna/Yunnan tourism; 	After sending several messages, our Douban account was blocked permanently on the next day, with the reason of “Some users reported that your account had illegal/ improper activities”.

	Sina Weibo 新浪微博 http://www.weibo.com/login.php	<ul style="list-style-type: none"> - users who posted microblogging (weibo) with their “locations” in Xishuangbanna; 	<p>Maximum 15 personal messages per day can be sent to strangers. Even so, our weibo account was blocked after several days.</p>
	Zhihu 知乎 https://www.zhihu.com/	<ul style="list-style-type: none"> - Ask Zhihu is a Chinese question-and-answer website, users who asked or answered questions regarding traveling in Xishuangbanna were targeted; 	<p>There was no limitation on the amount of questions one could send per day. However, there were not so many users whom we could address either. In total, about 70 personal messages were sent via Zhihu.</p>
Photo-sharing sites	Fengniao 蜂鸟网 http://www.fengniao.com/	<ul style="list-style-type: none"> - Users who posted photos taken in Xishuangbanna; 	<p>There was no limitation on the amount of questions one could send per day. And it was easy to find the target group, however, it could be observed that the users were not actively online in general. About 100 personal messages were sent. This included more or less all the users we could address personally on Fengniao.</p>
	Yupoo 又拍网 http://www.yupoo.com/	<ul style="list-style-type: none"> - Users who posted photos taken in Xishuangbanna; 	<p>There was very often a problem connecting to Yupoo.com when logging in, probably due to the foreign VPN. Not feasible.</p>

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