

# Study on the behavior and awareness of international tourists visiting Shirakawa-go: Toward sustainable tourism management

**Rika Okagawa** (Graduate School of Informatics, Nagoya University, rica@nagoya-u.jp, Japan)

**Mayu Urata** (Graduate School of Informatics, Nagoya University, mayu@i.nagoya-u.jp, Japan)

**Mamoru Endo** (Graduate School of Informatics, Nagoya University, endo@i.nagoya-u.jp, Japan)

## Abstract

*This study aims to identify issues related to tourist behaviour and manners based on data, focusing on the impacts of overtourism emerging in the World Heritage Site of Shirakawa-go. In September 2025, a multilingual questionnaire survey was conducted in both paper and online formats on-site, providing questionnaires in seven languages (Japanese, English, Spanish, Korean, Thai, Traditional Chinese, and Simplified Chinese), and 116 valid responses were collected. The analysis revealed that many tourists rely primarily on social media—especially Instagram—as their main source of information, whereas official communication in Shirakawa-go mainly depends on its website. This discrepancy indicates that accurate information is not sufficiently reaching visitors. This study presents foundational data on tourists' behavior and attitudes, highlighting the need for future initiatives that promote proper manners and deeper local understanding through multilingual social media communication. Going forward, the project aims to collaborate with local governments to refine survey design and methodology, enabling municipalities themselves to collect, analyze, and utilize data for effective tourism management.*

## Keywords

*overtourism, sustainable tourism, data-driven decision-making, tourism management support, tourist awareness*

## 1. Introduction

Tourism demand in Japan has been rapidly increasing since the COVID-19 pandemic. According to the Japan Tourism Agency [2024], the number of international visitors to Japan reached 25.07 million in 2023, with a total expenditure of 5.31 trillion yen by foreign tourists. Furthermore, it was reported that the number of inbound visitors rose to approximately 36.9 million in 2024, with total spending reaching around 8 trillion yen.

On the other hand, the rapid growth in tourist numbers has been pointed out to cause various negative impacts on local communities. Choi [2020] stated that “as tourists become concentrated in specific areas, negative effects of the tourism boom—such as rising prices, noise pollution, and infringements on basic living rights—are beginning to affect residents' daily lives, and the number of regions struggling to cope with these issues is increasing worldwide.” Such phenomena are widely discussed under the term “overtourism,” which has been recognized internationally as a major challenge to achieving sustainable tourism.

Overtourism has been widely recognized as a global issue in achieving sustainable tourism. Although the negative impacts of excessive tourist concentration on local communities and the environment have long been discussed, the problem drew international attention particularly around 2017, when it became prominent in cities such as Barcelona and Venice [UNWTO, 2018].

Shirakawa-go, located in Shirakawa Village, Gifu Prefec-

ture, was inscribed as a UNESCO World Cultural Heritage Site in 1995 and has since attracted a large number of domestic and international tourists. However, with a population of about 1,500 and approximately 2.15 million visitors annually, the village faces serious overtourism challenges. Problems such as traffic congestion, vehicle entry into restricted areas, trespassing on private property, and littering have been reported, leading to what is often described as “tourism pollution.”

The preservation of the traditional landscape has long been supported by the efforts of residents, but population decline, and aging are making it increasingly difficult to sustain. The population decreased by about 20 % from 1,877 in 2000 to 1,511 in 2020 [Statistics Bureau of Japan, 2020], and the aging rate reached 33.1 %, more than five points higher than the national average of 28.6 % [Statistics Bureau of Japan, 2020]. These demographic changes are creating difficulties in securing human and financial resources for maintaining the landscape and managing tourism.

Local residents have expressed concerns such as “Things are happening that would be unthinkable by Japanese common sense,” and “When attracting inbound tourists, efforts to convey Japanese culture and manners should be implemented simultaneously” [Shirakawa-going.jp, 2025]. These voices highlight the urgent need for concrete measures to protect the community.

In recent years, Shirakawa-go has been actively promoting responsive tourism, an approach that emphasizes mutual understanding and behavioural adaptation between tourists and local residents to achieve sustainable coexistence.

## 2. Background

Previous studies have categorized tourist destinations into

urban, natural, and resort types, noting that the greater the overlap between tourist and residential areas, the greater the impact on residents' daily lives [Nara and Maekawa, 2019]. However, Shirakawa-go, being both a tourist and residential area, does not fit neatly into these categories. Hence, understanding the area's reality requires a new perspective.

While extensive studies have addressed overtourism in urban destinations and the behavioral characteristics of inbound tourists, surveys focusing on rural World Heritage sites like Shirakawa-go remain limited. This study fills this gap by examining tourists' motivations, awareness of manners, and attitudes toward environmental conservation.

Our research group is currently developing a dual-perspective data infrastructure that integrates subjective data, such as residents' perceived crowding, with objective data obtained through AI-based video analysis of vehicle and pedestrian flow. This survey complements that initiative by capturing tourists' behavioral and attitudinal tendencies, providing a multi-perspective understanding of Shirakawa-go's tourism situation.

### 3. Methodology

A questionnaire survey was conducted on September 16, 2025, targeting both domestic and international tourists visiting Shirakawa-go. Three student members of the research team randomly approached tourists on-site and asked for their cooperation (Figure 1). Surveys were distributed both in paper and online formats at three major visitor points: Saseragi Park Parking Lot, Shuttle Bus Stop, and Shirakawa-go Bus Terminal. A total of 116 valid responses were collected (30 paper-based and 86 online).

The questionnaire was available in seven languages—Japanese, English, Spanish, Korean, Thai, Traditional Chinese, and Simplified Chinese. Translations were reviewed by native speakers, and all questions were designed to be completed within five minutes. The questionnaire included items on basic attributes (nationality and age), sources of information, awareness of tourism manners, and attitudes toward environmental conservation, such as willingness to pay a contribution fee and opinions on the installation of waste bins. Nationality was pro-



Figure 1: On-site questionnaire survey  
Note: Photograph taken during the survey.

vided as a free-text entry, while the other items were mainly multiple-choice questions. In addition, only the online version contained an extra question regarding the types of maps used during the visit.

## 4. Results and discussion

### 4.1 Nationality distribution

The nationalities of the respondents are shown in Table 1. A total of 116 responses were collected in this survey, of which two did not include nationality information, resulting in 114 valid responses for this item. The most common nationalities were Spain, Taiwan, the U.S.A., and China, with respondents representing 24 countries and regions in total. Japan accounted for the largest share (17 %), followed by Spain (16 %) and Taiwan (13 %). The U.S.A. (8 %), China (5 %), and Israel (4 %) also represented notable portions, while the remaining nationalities were distributed in small numbers (1–3 % each). By region, Asia accounted for 37.7 %, followed by Europe (32.4 %), Central and South America (10.5 %), North America (9.6 %), the Middle East (4.3 %), and Oceania (1.8 %).

Table 1: Nationality of respondents

Country	Count	Country	Count
Japan	20	Argentina	3
Spain	18	Portugal	2
Taiwan	15	Canada	2
U.S.A.	9	Australia	2
China	6	UK	2
Israel	5	(No Data)	2
Brazil	4	Poland	2
Malaysia	4	Lithuania	2
France	4	Hong Kong	1
Mexico	4	Ecuador	1
Germany	3	Indonesia	1
Italy	3	Belgium	1
Total			116

According to the Japan National Tourism Organizatio [2025], about 70 % of all inbound tourists to Japan are from Asian countries, particularly South Korea, Taiwan, China, and Hong Kong. However, the relatively high proportion of respondents from Europe and Central/South America in this survey suggests that Shirakawa-go, as a rural World Heritage site, attracts visitors from a more diverse range of regions.

### 4.2 Language

Among all 116 valid responses, English was the most common language (40 %), followed by Japanese (21 %), Spanish (21 %), Traditional Chinese (14 %), and Simplified Chinese (4 %). English was used by tourists from a wide range of nationalities, particularly those from North America and Europe. Spanish was mainly used by respondents from Spain and Latin Amer-

ica. Responses written in Japanese by non-Japanese nationals were assumed to be from long-term residents in Japan or Japanese language learners.

The inclusion of both Traditional and Simplified Chinese versions allowed for appropriate data collection from different regions within the Chinese-speaking community. However, several respondents expressed interest in a French version of the questionnaire.

#### 4.3 Information sources used by tourists

To understand how tourists obtained information about Shirakawa-go, respondents were asked how they searched for and learned about the destination.

As shown in Table 2, social networking services (SNS) were the most common source, accounting for 59.5 % of all responses—nearly 60 % of the total. This was followed by recommendations from friends or family (26.7 %) and travel agencies (21.6 %). In contrast, only 10.3 % of respondents reported using the official website of Shirakawa-go, which is the village's main channel for information dissemination. This suggests that official online communication may not be effectively reaching or assisting visitors in gathering information about Shirakawa-go.

Table 2: Information sources used by tourists

Category	Number of responses	Percentage (%)
SNS	69	59.5
Recommendations from friends/family	31	26.7
Travel agencies	25	21.6
TV, magazines, or news	17	14.7
Official website	12	10.3
Google Map	7	6.0
Others (e.g., classes, ChatGPT, etc.)	7	6.0

#### 4.4 Abstract and keywords

Table 3 shows the responses of 69 participants who had previously reported using SNS to gather information about Shirakawa-go, indicating which platforms they referred to.

Instagram was the most frequently used platform, accounting for 53.4 % of all responses, followed by YouTube (31.9 %). Respondents from various nationalities mentioned that they watched short videos on these platforms.

In total, the 69 SNS users provided 133 responses, indicating that each respondent used an average of 1.93 different SNS platforms. This suggests that tourists tend to combine multiple SNS platforms when collecting information about their destinations.

#### 4.5 Recognition of tourism manners information in Shirakawa-go

To assess the extent to which information dissemination has reached tourists, respondents were asked whether they

Table 3: SNS platforms used by tourists to gather information about Shirakawa-go

SNS Platform	Number of responses	Percentage (%)
Instagram	37	53.4
YouTube	22	31.9
Google Maps	16	23.2
TikTok	16	23.2
Facebook	10	16.4
Google Reviews	7	11.5
Xiaohongshu / RED	7	11.5
Reddit	4	6.6
Pinterest	2	3.3
TripAdvisor	2	3.3
Twitter / X	2	3.3
WeChat	2	3.3
Weibo	2	3.3
Douyin	1	1.6
Meituan	1	1.6

Note: Percentages and numbers are based on 133 responses from 69 respondents who reported using SNS.

had checked or seen any articles, posters, or videos related to tourism manners within Shirakawa-go. As a result, 72 % of respondents answered that they had seen such materials, while 28 % had not.

This indicates that many tourists have been exposed to some form of information about tourism manners in Shirakawa-go, however, about 30 % have not encountered such information at all.

#### 4.6 Regional differences in awareness of tourism manners information in Shirakawa-go

Table 4 presents the results of the analysis by region. Among domestic tourists from Japan, approximately 40 % responded that they had not checked or seen any information about tourism manners in Shirakawa-go. This may be because such manners are perceived as common knowledge among domestic visitors, reducing the need for explicit information seeking.

For tourists from East Asia (Taiwan, China, Hong Kong), about 70 % reported checking posters within Shirakawa-go, followed by around 50 % who confirmed information via SNS. This suggests that while on-site posters are the primary source, many also cross-check information through SNS.

Tourists from Southeast Asia (Malaysia, Indonesia) showed similar tendencies, with 40 % each using posters and SNS.

For visitors from Europe (Spain, France, Germany, Italy, etc.), around 70 % obtained information through posters, and about 30 % through videos played on transportation routes from Takayama or Kanazawa. Compared with Asian visitors, Europeans relied less on SNS for this purpose.

Among tourists from Central and South America (Brazil,

Table 4: Regional differences in awareness

Region	Number of responses	Main sources of information	Trend overview
Japan	20 (17.2 %)	Most common: Did not check (40 %); posters, public transport, SNS each 15 %.	Domestic tourists tend to regard etiquette as common sense, resulting in fewer explicit checking behaviors.
East Asia (Taiwan, China, Hong Kong)	22 (20 %)	Posters (68.2 %) most common; SNS (45.5 %), public transport and “Did not check” (18.2 %) follow.	On-site signage is effective, often combined with SNS use.
Southeast Asia (Malaysia, Indonesia)	5 (4.3 %)	Posters (40 %) and SNS (40 %) most common.	Similar to East Asia, with both signage and SNS used in parallel.
Europe (Spain, France, Germany, Italy, etc.)	37 (31.8 %)	Posters (67.6 %), public transport (27.0 %), travel agencies/tour guides (27.0 %).	On-site signage and transport-based media dominate; SNS usage (10.8 %) is the lowest among all regions.
North America (USA, Canada)	11 (9.5 %)	Posters (45.5 %), public transport (27.3 %).	Visitors tend to check etiquette through posters or in-transit media after arrival.
Latin America (Brazil, Mexico, Argentina, Ecuador, etc.)	12 (10.3 %)	Posters (50 %), public transport (41.7 %), “Did not check” (41.7 %), SNS (33.3 %).	On-site and transport-based materials are main sources; some rely on travel agencies.
Middle East (Israel)	5 (4.3 %)	Did not check (60 %), public transport (40 %).	Lack of awareness of etiquette information is prominent.
Oceania (Australia)	2 (1.7 %)	SNS (50 %), Did not check (50 %).	Sample size too small to determine a clear trend.

Mexico, Argentina, Ecuador, etc.), half obtained information from posters, and roughly 40 % either through transportation media or reported not checking any information.

For visitors from the Middle East (Israel), 60 % indicated they had not checked any information on tourism manners, while 40 % had seen it through transportation channels—showing limited awareness in this group. Responses from Oceania (Australia) were too few to identify any clear trend.

#### 4.7 Willingness to use paid waste bins

To understand tourists’ attitudes toward waste management in Shirakawa-go, respondents were asked whether they would use paid waste bins if such facilities were available.

Since there is no incineration facility within the village, all waste generated in Shirakawa-go must be transported to Takayama City for disposal, which incurs a cost. Therefore, an increase in waste generated by tourists directly impacts the village’s finances and has become a significant concern for local administration.

As shown in Table 5, 54 % of international tourists answered that they would use paid waste bins, indicating that more than half were willing to pay a fee to dispose of waste properly. In contrast, when including domestic tourists, the proportion who responded positively was 46.6 %, falling below half of the total. These results suggest that there are differences in environmental awareness and willingness to engage in eco-friendly behavior depending on nationality. Additionally, Mr. Yamada, Secretary-General of the Shirakawa-go World Heritage Site Gassho Style Preservation Trust, commented that “this is a very interesting and meaningful dataset. While the questionnaire asks whether tourists would pay to dispose of waste under the current ‘take-your-trash-home’ policy, it would also

Table 5: Willingness to pay for the use of waste bins in Shirakawa-go

Category	Respondents (N)	Would use (Yes)	Would not use (No)
Inbound tourists (non-Japanese)	95	54.0 %	46.0 %
All tourists (including Japanese)	115	46.6 %	53.4 %

be insightful to examine whether international tourists actually support the idea of taking their trash home.” This comment suggests that future surveys could further explore tourists’ perceptions of the ‘take-your-trash-home’ principle itself.

#### 4.8 Willingness to pay for environmental conservation

To understand tourists’ willingness to pay for environmental conservation in Shirakawa-go, two questions were asked and their results were compared (Table 6).

Table 6: Comparison of willingness to pay for waste bins and cooperation fee

Amount willing to pay (USD)	Paid Garbage Bin (%)	Environmental Cooperation Fee (%)
Would not pay	52.4	9.5
Up to \$1	35.2	33.6
Up to \$3	8.6	23.3
Up to \$5	1.9	16.4
Up to \$10	1.0	9.5
Up to \$20 or more	1.0	3.4

The first question was: “If paid waste bins were available, how much would you be willing to pay to use them?” Approximately half of both international and domestic tourists responded that they would be willing to pay around 1 to 3 USD. In contrast, only 3 % of respondents indicated a willingness to pay more than this amount.

Meanwhile, 48 % of international tourists and 52 % of all respondents (including domestic tourists) answered that they would not be willing to pay, indicating that acceptance of economic burdens related to waste management is limited.

The second question asked: “How much would you be willing to contribute as a cooperation fee?” (Table 6).

The most common response was “around 1 USD” (34 %), followed by “around 3 USD” (23 %).

Combined, these responses show that a majority of tourists are willing to pay between 1 and 3 USD. Furthermore, including those who answered “5 USD or more,” over 90 % expressed willingness to contribute in some form.

These results suggest that many tourists show a certain level of understanding and acceptance toward paid systems.

By setting an appropriate fee structure and providing convenient payment methods, it may be possible to design a system that contributes to both tourism management and environmental conservation.

## 5. Conclusion and future work

This study conducted a questionnaire survey to clarify tourists’ behavioral characteristics, awareness of tourism manners, and attitudes toward environmental conservation in response to the emerging issues in the World Heritage site of Shirakawa-go.

The results revealed several tendencies in tourists’ behaviors and perceptions. In particular, many tourists relied on social networking services (SNS) as their main source of information, with Instagram being the most prominent platform. However,

the official Shirakawa-go Instagram account was found to be inactive, indicating that it is not being effectively utilized. Reviewing and strengthening the village’s information dissemination strategy could therefore lead to more effective communication with visitors.

Although the current system for continuous data collection and analysis remains limited, the findings of this study suggest that accumulating such data over time could help objectively identify local issues and opportunities for improvement. Going forward, it will be essential to collaborate with the local government to share the importance of data-driven approaches and to develop feasible survey and analysis frameworks within limited local resources.

As shown in Figure 2, the position of this study can be summarized as a multi-phase framework that connects survey implementation, collaboration with the local government, and the establishment of a sustainable data management system.

In the current fiscal year, our laboratory will take the lead in conducting multiple rounds of questionnaire surveys and sharing the potential directions for sustainable tourism management with the local government based on the obtained results. From the next fiscal year onward, we plan to conduct follow-up surveys and jointly examine concrete policy measures with the municipality. Through this process, we aim to foster an autonomous framework in which the local government can continuously collect and utilize data on its own.

## Acknowledgements

The authors would like to express their sincere gratitude to Mr. Yamada of Shirakawa-go World Heritage Site Gassho Style Preservation Trust, and to all the members of the Shirakawa-go Tourism Association for their generous support and cooperation in conducting this survey. The authors also wish to thank the tourists who kindly responded to the questionnaire, as well as Ms. Bien and Ms. Yoshida for their dedicated assistance in

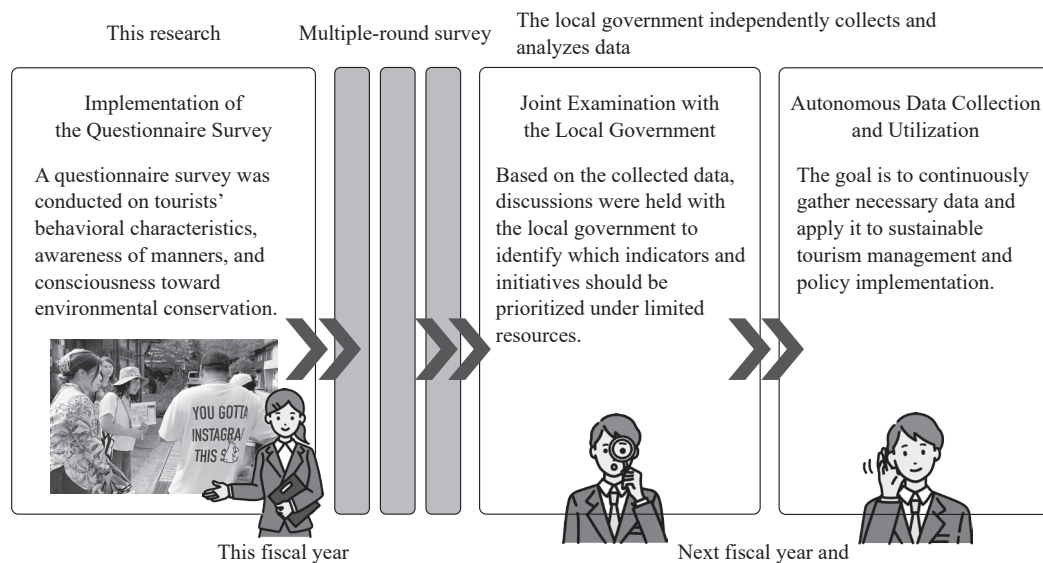


Figure 2: The position and future of this study



the preparation and on-site survey. This research was partially supported by the Toyoaki Scholarship Foundation and The Inamori Foundation.

## References

- Choi, K. J. (2020). The occurrence of overtourism and challenges for sustainable tourism development. *Journal of International and Economic Studies, Kyushu International University*, 5 (Retrieved November 18, 2025 from <https://files.core.ac.uk/download/pdf/322536859.pdf>). (in Japanese).
- Japan Tourism Agency (2024). *Survey on consumption trends of international visitors to Japan (Annual report 2023)*. (Retrieved November 18, 2025 from [https://www.mlit.go.jp/kankocho/topics02\\_00004.html](https://www.mlit.go.jp/kankocho/topics02_00004.html)). (in Japanese)
- Japan National Tourism Organization (2025). *Visitor arrivals to Japan: December 2024 and annual estimated total (2024)* (Retrieved November 18, 2025 from [https://www.jnto.go.jp/news/\\_files/20250115\\_1615.pdf](https://www.jnto.go.jp/news/_files/20250115_1615.pdf)). (in Japanese)
- UNWTO (2018). *Overtourism?: Understanding and managing urban tourism growth beyond perceptions*. World Tourism Organization, pp. 1-68.
- Shirakawa-going.jp (2025). *Village residents' interviews* (Retrieved November 18, 2025 from <https://shirakawa-going.jp/interview>). (in Japanese)
- Statistics Bureau of Japan (2020). *Population census 2020* (Retrieved November 18, 2025 from <https://www.stat.go.jp/english/data/kokusei/index.html>). (in Japanese)
- Nara, M. and Maekawa, Y. (2019). *A study on the factors causing overtourism in tourist destinations*. Graduate School of Management, Kyoto University. (in Japanese).
- Japan Tourism Agency (2025). *Report on congestion mitigation and dispersion efforts in Shirakawa-go tourism (Operation results of Shirakawa-Going)*. pp. 173-184.

---

Received: October 31, 2025

Revised: November 20, 2025

Accepted: November 25, 2025

Published: November 30, 2025

Copyright © 2025 International Society for Tourism Research



This article is licensed under a Creative Commons [Attribution-Non-Commercial-NoDerivatives 4.0 International] license.



[https://doi.org/10.37020/jgtr.10.2\\_159](https://doi.org/10.37020/jgtr.10.2_159)