

Exploring the issues and potential of astro-tourism development in developing countries: A case study of Mongolia

Koki Sawada^{a,b,*}, Hidehiko Agata^c, Masami Okyudo^{d,b}

^aGraduate School of Tourism, Wakayama University, Japan

^bCenter for Tourism Research, Wakayama University, Japan

^cPublic Relations Center, National Astronomical Observatory of Japan, Japan

^dWakayama University, Japan

Abstract

In recent years, the Mongolian government has sought to promote tourism as a growth industry comparable to mining and agriculture. This study examines the growth of astrotourism in Mongolia. Recently, astrotourism has attracted international attention as a sustainable form of tourism. In May 2023, the authors had the opportunity to participate in an astrotour organised by a small Mongolian travel agency. Based on the observations of the tour participation and interviews with those involved, this report discusses the possibilities and challenges of introducing astrotourism in developing countries.

Keywords

Astro-tourism
Mongolia
Developing country
Astronomy outreach
Special interest tourism

Introduction

Tourism is considered an economic panacea for developing countries, offering a non-polluting industry that serves as an ideal economic alternative to traditional primary and secondary sectors in developing countries (Opperman & Chon, 1997). However, in a competitive global economy, most developing countries have made efforts to develop various tourism products for inbound travellers (Telfer & Sharpley, 2008). Rapid economic development in emerging economies is contributing to increased demand for international tourism, while at the same time, new destinations are entering the tourism market, intensifying national competition to attract international tourists (Jenkins, 2015).

Furthermore, with the constant diversification of leisure interests in postmodern society, tour products have moved away from standardised package tours to more flexible and personalised options, notably those provided by smaller, specialised travel agencies. (Uriely, 2005). Tourism in which travellers' motivations and decision-making are determined primarily by specific special interests is called special-interest tourism and is gaining attention in developing countries (Agarwal et al., 2018).

Astrotourism, classified as a form of special-interest tourism (Soleimani et al., 2018), involves individuals traveling beyond their residences to marvel at the celestial bodies and the enchanting starry sky. This activity holds promise for invigorating the nighttime economy in local communities (Mitchell & Gallaway, 2019), fostering equal employment opportunities for women and men in developing countries (Dalglish et al., 2021), facilitating scientific astronomy communication for the general public (Blundell et al., 2020), and preserving the star lore of local communities (Sawada et al., 2023). Given its potential to align with sustainable development goals, astrotourism has garnered significant interest from developing countries (Sawada & Okyudo, 2022).

This report examines an ongoing astrotour in Mongolia in which the authors participated in May 2023. It discusses the

possibilities and challenges of astrotourism development in developing countries based on findings from tours and interviews with stakeholders.

Astrotourism in Dalanzadgad City, Ömnögovi Aimag, Mongolia

This study uses Mongolia as a case study. Mongolia has a low population density, with approximately 3.3 million people on a land of approximately 1,564,100 km², which borders China and Russia (Japan International Cooperation Agency, 2021). Mongolia was governed by a socialist system until 1990. At that time, international travel in the country was strictly controlled by the national government. Thus, most inbound visitors came from the former Soviet Union and other Eastern European countries (Bayansan, 2018). With the introduction of a liberal economic system in 1990, the number of foreign visitors from East Asian countries such as China, Korea, and Japan began to gradually increase (Figure 1). The tourism industry was expected to become a major domestic industry, along with mining and agriculture (Bayansan, 2018). The Mongolian government has made efforts to stimulate the travel of inbound tourists and increase their economic impact through the establishment of the National Tourism Board in 1995, the enactment of the Law on Travel and Tourism in 2000, and the adoption of the "Visit Mongolia Year" in 2003 (Yu & Goulden, 2006).

According to Yu and Goulden (2006), inbound tourists are satisfied with natural and nomadic lifestyles and traditional festivals. However, their opinions are critical of tourism facilities, transportation, and nightlife (Yu & Goulden, 2006). A JICA study (2021) indicated that the lack of nightlife content is a challenge for Mongolian tourism. The Mongolian cultural landscape, which includes nomads and gers, is undoubtedly a central marketing image and a feature of its main tourism product (Buckley et al., 2008). However, as inbound tourists tend not to be satisfied with the nightlife, some parts of Mongolia has recently begun to introduce astrotourism, which

*Corresponding author

Email address: t111055@wakayama-u.ac.jp (K. Sawada)

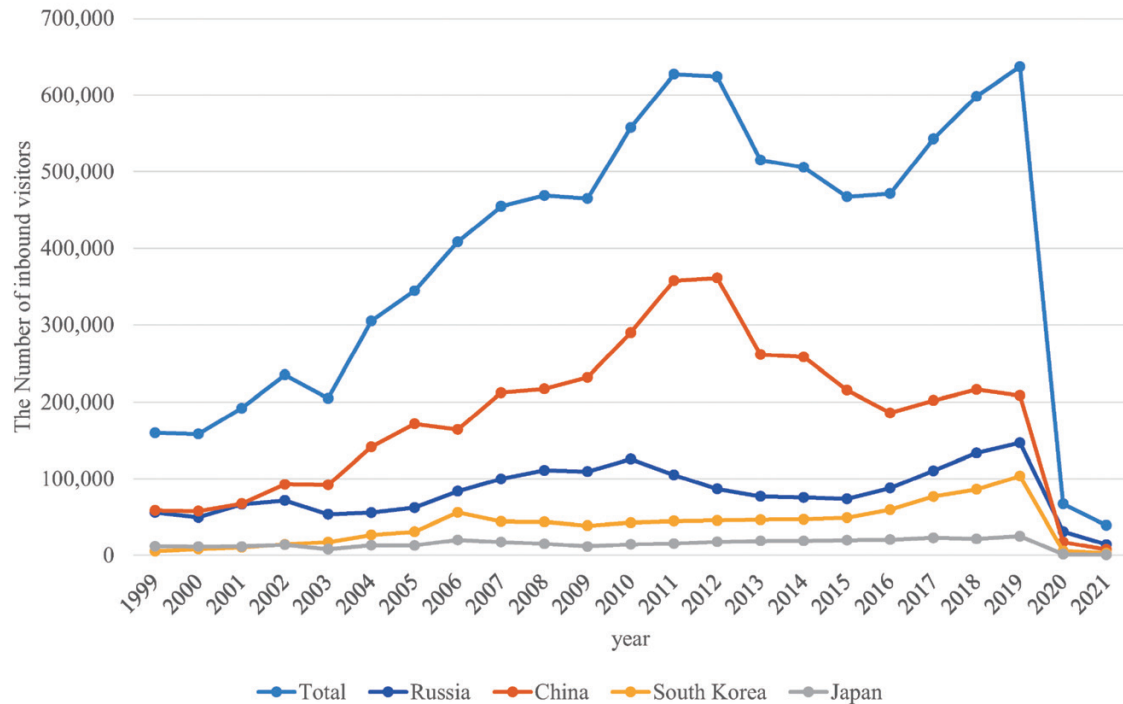


Figure 1. The number of inbound visitors by the top four countries of origin from 1999 to 2021 (National Statistical Office of Mongolia, 2023)

takes advantage of the beautiful night sky. In fact, JICA (2021) cites the Great Plains and starry skies as strengths of Ömnögovı Aimag.

Two of the authors, including the lead author, participated in an astroecology tour of Dalanzadgad City, Ömnögovı Aimag, southern Mongolia, from May 20 to 24, 2023 (Table 1). Dalanzadgad City is the largest city in Ömnögovı Aimag, approximately 580 km or 10 h by bus from Ulaanbaatar (Figure 2), with nearly 70,000 people and mining as its main industry (Japan International Cooperation Agency, 2021). Since 2000, the mining sector has grown significantly, with the development of the Tawan Tolgoi and Oyu Tolgoi copper and gold mines, which are among the world's leading mines (Japan International Cooperation Agency, 2021).

Overnight accommodations for the tour were gers at the Goviin Urguu Tourist Camp, and their most significant feature was the tree-planting experience in the area surrounding the accommodation. Desertification has worsened in Mongolia due to the effects of global warming, the negative impact of mass tourism, and the overgrazing of cashmere goats (Bayansan, 2018). The tour is positioned as a development of astroecology that combines astronomy and ecology, and the tree-planting experience is part of an effort to protect Mongolian greenery. In addition, it includes Bayanzag, where the world's first dinosaur eggs were discovered, and Yoliin Amu Valley.

The night of the tour's main event, Star Party, was not a beautiful night sky, as the authors expected. The stars to the north were washed out by the artificial lighting from Dalanzadgad (Figure 3). When one of the authors visited Dalanzadgad in June 2011, there was virtually no light as the mining industry flourished in Dalanzadgad City, it came to be no longer considered an ideal place for astrotourism. For an ideal starry sky, visitors must visit campsites that are further away from the city.

However, the view of the universe through the telescope was amazing. First-magnitude stars and Messier objects were

Table 1. The travel itinerary of the astrotour in Mongolia (made by the authors)

Day 1 (20 May)	Arrive in Mongolia/ Hotel check-in
Day 2 (21 May)	07:00 - Pick up from hotel 07:30 - Leave Ulaanbaatar, travel to Mandalgovi 13:30 - Lunch at Mandalgovi, Dundgovi 14:30 - Travel to Dalanzadgad 20:30 - Arrive at Dalanzadgad, travel to Goviin Urguu resort (Ger camp) 21:30 - Dinner 23:00 - Stargazing party in Goviin Urguu Resort
Day 3 (22 May)	08:00 - Breakfast 09:30 - Workshop & opening ceremony (in partnership with "NUM-ITC-UNESCO Space Science and RemoteSensing Laboratory, National University of Mongolia") 14:00 - Lunch 15:00 - Travel to Bayanzag (Flaming Cliffs) 17:00 - Explore Bayanzag 18:00 - Travel back to the Resort 21:30 - Dinner 24:00 - Free time star gazing
Day 4 (23 May)	06:00 - Early morning hiking to Yoliin am 08:00 - Breakfast 09:30 - Tree planting activity 11:00 - Travel back to Ulaanbaatar 17:00 - Lunch at Mandalgovi 18:00 - Travel to Ulaanbaatar 23:30 - Back in Ulaanbaatar
Day 5 (24 May)	Departure from Mongolia (to bring airport)

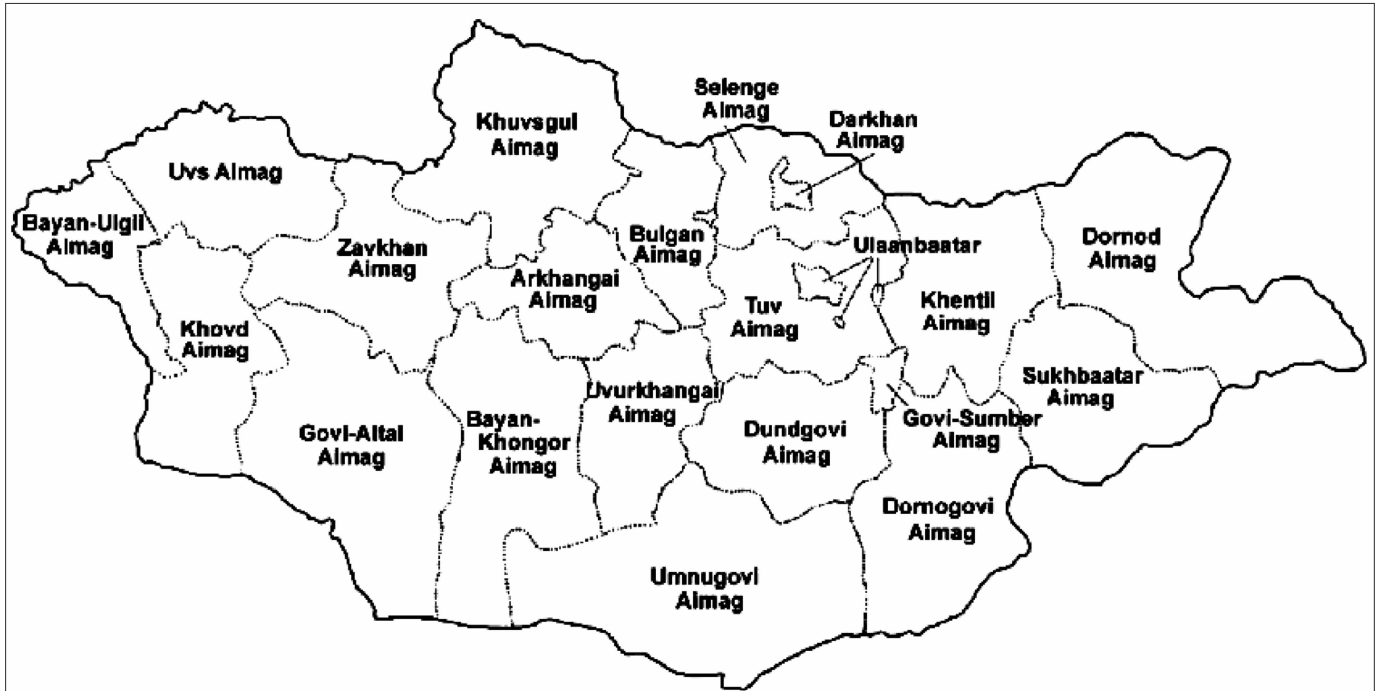


Figure 2. Administrative map of Mongolia showing the provinces (aimags).



Figure 3. Artificial lighting from Dalanzadgad City (taken by the first author)



Figure 4. Stargazing party in Goviin Urguu Resort (taken by the Nart Adventure LCC)

enjoyed through a Dobsonian telescope brought by a Russian, one of the participants (Figure 4). The young Russian man who accompanied us introduced the Messier objects in sequence, explaining them in a lighthearted manner. We were also impressed by a Russian woman who murmured, “We should all be equal under the night sky.” Sharing stories under the Mongolian night sky, which transcends nationality and culture, is extraordinary.

Interview

On May 24, 2023, the first author interviewed a representative of the Mongolian travel agency that organised the tour in Japanese. The main points were as follows:

The representative was born in 1988 and lived in Japan until graduating from elementary school. Thus, he was able to speak Japanese. He became interested in astrotourism after being fascinated by the astronomical outreach activities of the National Astronomical Observatory of Japan (NAOJ) during the IYA2009 project held in Ulaanbaatar. His company, with only five employees, is a small travel agency specialising in astrotourism and focuses on community-based tourism in Mongolia. In the future, he hopes to organise space tourism tours for Mongolians.

He began his astrotour agency in 2020. Initially, it was organised as part of an astronomy outreach program in remote areas, mainly targeting inbound travelers; his company offers various tour products, including a star party near Ulaanbaatar, an astroecology tour combining astronomy and tree planting, an astroarchaeology tour visiting ancient astronomical sites, and an astronomadic tour traveling with

nomadic tribes and viewing the night skies. He said that it was important to combine various activities because the astrotour would not be enough to entertain tourists owing to weather conditions. Tour rates were set at US\$700–\$800 for a 6-night tour, with profit margins ranging from 10% to 30%.

As his company is small and has a short history, it does not yet have sufficient confidence to enter into travel contracts with Japanese travel agencies and other international companies; therefore, travel contracts with them are signed through intermediaries. The current goal is to increase the number of business transactions with foreign companies and to form partnerships with international travel agencies. As a private company, it focuses on profit margins, but also wants to create an astronomy outreach program for children in remote areas, for which the interviewee is beginning to create web-based resources. When tours are held in remote areas, the company hosts free star parties for the communities, so that local children can easily participate.

When asked about the Mongolian government’s recent tourism policy, the interviewee said that efforts to ease visas and barriers to entry into the travel industry began in 2023 with the goal of developing tourism as an industry on par with mining. Although the effect is unclear, it may increase Mongolian competitiveness in attracting inbound tourists.

Discussion and Conclusion

In conclusion, we provide preliminary discussions of the potential challenges to astrotourism development in developing countries. This paper presents four perspectives.

First, the development of astrotourism will contribute to the

astronomy, education, and outreach activities of local communities in developing countries. Local residents living in remote areas of developing countries have few opportunities to come into contact with telescopes, and organising a star party in their area may provide them with an opportunity to experience astronomy. It is also hoped that academic institutions such as the National University of Mongolia and the National Astronomical Observatory of Mongolia will provide backup to make astronomy education and outreach more effective.

Second, we address how astrotourism and artificial light coexist. Weaver (2011) noted that the promotion of astrotourism raises the awareness of light pollution prevention; however, the impact is more severe in Dalanzadgad. Although the Mongolian government aims to promote tourism in Ömnögovi Aimag (Japan International Cooperation Agency, 2021), in the context of astrotourism, the area is not an appropriate space for an astrotourism destination. As industry concentration increases, so does the likelihood of light pollution, unless the local population is sufficiently educated. Balancing the development of mining with tourism remains a major challenge.

Third, the power relations between travel agencies in developed countries and small agencies in developing countries should be considered. As seen in the interview narrative above, small travel agencies in developing countries can only deal with other countries through intermediaries, and must set prices and arrange tour itineraries according to the demands of developed countries. The Mongolian government is expected to deregulate the travel industry in order to increase the number of small travel agencies. Overabundance can lead to unbalanced subordination, whereby developed countries exploit developing countries by choosing travel agents that offer lower prices (Telfer & Sharpley, 2008). Even small travel agencies in developing countries must establish systems that enable them to manage inbound tourists directly.

Fourth, whether remote communities can receive socioeconomic benefits from astrotourism development remains an issue. In other words, economic benefits should not be concentrated in Ulaanbaatar but should also be returned to the local community. Telfer and Sharpley (2008) pointed out the dilemma of tourism development in developing countries: In many cases the economic benefits are absorbed by urban elites, and local communities must pay socioeconomic or environmental costs. Diversifying the economic benefits will be a challenge for future research.

The Mongolian government has designated 2023–2025 as the “Year of Visiting Mongolia” and is working to improve the quality of its tourism product and infrastructure with the goal of attracting 1 million tourists (Japan International Cooperation Agency, 2021). The demand for astrotourism in Mongolia is expected to increase due to inbound tourists. We intend to continue working with the National University of Mongolia and other stakeholders to resolve the issues discussed in this section.

Acknowledgment

This paper is a substantial addition and revision of Agata et al (2023). The authors would like to thank professor Tsolmon Renchin of the National University of Mongolia and Mr. Bayarkhuu Chinzorig of Nart Adventure LCC for their great help in writing this paper. This work was supported by Grant-in-Aid for KAKENHI 22K12613

References

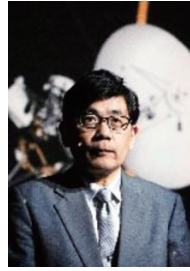
- Agarwal, S., Busby, G., & Huang, R. (2018). Special Interest Tourism: An Introduction. Agarwal, S., Busby, G., & Huang, R. (Eds). *Special Interest Tourism: Concepts, Contexts and Cases* (pp. 1-17). CAB International.
- Agata, H., Sawada, K., Chinzorig, B., & Renchin, T. (2023, August 23-27). *A Drop of Rain Falls on the Gobi Desert: a Trial of Astro-Ecotourism*. Global Hands-on Universe Conference 2023, Kagoshima, Japan. <https://astrotourism.jp/wp-content/uploads/2023/08/programbook.pdf>
- Bayansan, P. (2018). *Tourism Industry Based on Environmental Conservation in Mongolian Regions*. [Doctoral dissertation, Takasaki City University of Economics (in Japanese)]. Takasaki City University of Economics Repository. <https://tcue.repo.nii.ac.jp/records/1028>
- Blundell, E., Schaffer, V., & Moyle, D. B. (2020). Dark sky tourism and the sustainability of regional tourism destinations. *Tourism Recreation Research*, 45 (4), 549-556. <https://doi.org/10.1080/02508281.2020.1782084>
- Buckley, R., Ollenburg, C., & Zhong, L. (2008). Cultural landscape in mongolian tourism. *Annals of Tourism Research*, 35 (1), 47-61. <https://doi.org/10.1016/j.annals.2007.06.007>
- Dalglish, S. H., Mengistie, M. S., Backes, M., Cotter, G., & Kasai, K. E. (2021). Dark sky tourism and sustainable development in Namibia. *Proceedings of the International Astronomical Union*, 15, 360-362. <https://doi.org/10.1017/S1743921321000478>
- Japan International Cooperation Agency. (2021). *Mongolia Data Collection Survey on Sustainable Tourism Development in Mongolia Final report*. (3R-JR-21-005). <https://openjicareport.jica.go.jp/pdf/12366928.pdf>
- Jenkins, L. C. (2015). Tourism policy and planning for developing countries: some critical issues. *Tourism Recreation Research*, 40 (2), 144-156. <https://doi.org/10.1080/02508281.2015.1045363>
- Mitchell, D., & Gallaway, T. (2019). Dark sky tourism: economic impacts on the Colorado Plateau Economy, USA. *Tourism Review*, 74 (4), 930-942. <https://doi.org/10.1108/TR-10-2018-0146>
- Opperman, M., & Chon, S. K. (1997). *Tourism in Developing Countries*. International Thomson Business Press.
- Sawada, K., & Okyudo, M. (2022). Exploring the astro-tourism space: A review of the English literature to build a research framework in Japan. *Tourism Studies*, 26, 85-102. <http://dx.doi.org/10.19002/AA12438820.26.85>
- Sawada, K., Yonezawa, T., & Okyudo, M. (2023). Astro-tourism and sustainable development: A case study of Yoron Island, Kagoshima Prefecture, Japan. *Wakayama Tourism Review*, 4, 21-24. <http://dx.doi.org/10.19002/24363839.4.21>
- Soleimani, S., Bruwer, J., Gross, J. M., & Lee, R. (2018). Astro-tourism conceptualisation as special-interest tourism (SIT) field: a phenomenological approach. *Current Issues in Tourism*, 22 (18), 2299-2314.
- Telfer, J. D., & Sharpley, R. (2008). *Tourism and Development in the Developing World*. Routledge.
- The National Statistical Office of Mongolia. (2023). Number of Inbound and Outbound Foreign Passengers, by country of origin. Retrieved September 21, 2023 from <https://www.nso.mn/en/statistic/statcate/573068/table-view/>

DT_NSO_1800_004V2

- Uriely, N. (2005). The tourist experience: Conceptual Developments. *Annals of Tourism Research*, 32 (1), 199-216. <https://doi.org/10.1016/j.annals.2004.07.008>
- Weaver, D. (2011). Celestial ecotourism: new horizons in nature-based tourism. *Journal of Ecotourism*, 10 (1), 38-45. <https://doi.org/10.1080/14724040903576116>
- Yu, L., & Goulden, M. (2006). A comparative analysis of international tourists' satisfaction in Mongolia. *Tourism Management*, 27 (6), 1331-1342. <https://doi.org/10.1016/j.tourman.2005.06.003>



Koki Sawada is pursuing a Ph.D. in tourism at Wakayama University in Japan and is a Visiting Junior Fellow at the Center for Tourism Research at the same university. He has been engaged in astro-tourism development in several Japanese areas, especially Yoron Island, Kagoshima Prefecture. His current research interests include the social history of astro-tourism in Japan, cultural studies in tourism, and virtual reality in tourism. His recent work is published in *Communicating Astronomy with the Public Journal*.



Hidehiko Agata is an Associate Professor with the Public Relations Center at the National Astronomical Observatory of Japan. He has served as Supervising Director of OAO (Office for Astronomy Outreach), IAU since 2014. He is also the president of the SORA Tourism Promotion Council, which has been promoting Astro-tourism in Japan since 2017.



Masami Okyudo is an Executive Director with the officer at Wakayama University and a Professor at the Graduate School of Tourism at the same University in Japan. He joined Wakayama University in 2003 after completing his PhD at Saga University in Japan. He worked in several public observatories in Japan for over a decade. His current research interest includes astro-tourism, human engineering, ICT, and virtual reality in tourism.