

Evaluation and Improvement Strategies of Accessible Tourism Experience in Mount Tai Scenic Area

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Abstract Mount Tai Scenic Area has achieved certain results in the construction of accessible tourism facilities, realizing the exploration of digital and intelligent transformation in traditional mountain scenic areas. In this study, using questionnaire surveys and in-depth interviews, the development of accessible tourism in Mount Tai Scenic Area was investigated and analyzed. Some countermeasures were put forward, including strengthening information guidance services, enhancing awareness and skills in accessibility services, improving feedback mechanisms for continuous refinement, and strengthening collaborations in the fields of the disabled and accessibility development, aiming to further promote humanistic care and enhance service satisfaction at the scenic area.

Keywords Accessibility, Questionnaire survey, In-depth interview, Digital and intelligent transformation, Mount Tai Scenic Area

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According to data released by the National Bureau of Statistics, the total number of people with disabilities in China reached 85.914 million by the end of 2022. On June 28, 2023, the Standing Committee of the 14th National People's Congress voted to pass the *Law of the People's Republic of China on the Construction of a Barrier-free Environment*, which came into effect on September 1, 2023. Article 45 of the law states: The state encourages cultural, tourism, sports, financial, postal and other service venues to provide assistive devices, consultation, guidance, and other accessible services for persons with disabilities, older persons, and others in accordance with the services they offer.

Accessible tourism primarily involves a range of services and facilities designed for individuals with specific access needs, enabling them to visit and enjoy scenic sites without barriers. This group includes the elderly, people with disabilities, pregnant women, as well as those with chronic illnesses or allergies. The goal of accessible tourism is to ensure that everyone can have autonomy over their own travel experiences. Research on accessible tourism not only enables tourists from vulnerable groups to successfully meet the challenge of reaching the summit of Mount Tai, but also enhances the overall service quality and image of the Mount Tai Scenic Area, promoting its sustainable development.

1 Current research status and significance of accessible tourism at home and abroad

The current state of domestic research on accessible tourism has been understood by reviewing literature on the tourism market for people with disabilities and development barriers. Zhao^[1] comprehensively evaluated the accessible tourism environment of Rongjiadong Forest Farm from the perspective of wheelchair tourists, and elaborated on issues related to the construction of accessible tourism. Du^[2] conducted a comprehensive survey of the barrier-free facilities in Fuzhou's parks, summarized the strengths and shortcomings in the construction of an accessible tourism environment, and proposed recommendations and countermeasures from both macro and micro perspectives. Yu^[3] applied universal design principles to urban landscaping. Tao et al.^[4] explored the impact of destination website accessibility on accessible tourism, initiating research into the accessibility of tourism destination websites. Wang^[5] proposed recommendations for barrier-free renovations in ancient towns of Western Sichuan. Conducting investigative research on accessible tourism using Mount Tai as a case study serves as an effective supplement to existing empirical research areas. The promotion and application of the research findings not only contribute to the refinement of the theoretical framework but also provide robust theoretical support and guidance for related practical activities.

Research on accessible tourism in Mount Tai Scenic Area will contribute to improving the development standards for accessible tourism in mountain-based scenic areas in China, providing a scientific basis for refining the scenic area rating system. Meanwhile, it will help identify potential safety hazards within the area, offering a basis for the formulation of preventive measures. The safety of tourists will be further ensured by improving barrier-free facilities and accessibility services. The development of accessible tourism at Mount Tai Scenic Area will not only promote the standardization and quality enhancement of the scenic area's tourism services but also help strengthen its competitiveness in the international tourism market.

2 Current development status of accessible tourism at Mount Tai Scenic Area

2.1 Overview of Mount Tai Scenic Area

Mount Tai is a national 5A-level tourist attraction and a world geological park, recognized as China's first World Cultural and Natural Heritage site by UNESCO. In recent years, the number of visitors to Mount Tai has increased annually. In 2021, the scenic area received 2.835 million tourists, representing a 5% growth compared with 2020. In 2022, Mount Tai Scenic Area received 2.14 million visitors, 30.5% less than that in 2021 due to the impact of the pandemic. In 2023, the scenic area welcomed 8.619 7 million tourists, marking a year-on-year increase of 301.36%. It generated revenue of

548.530 6 million yuan, reflecting a growth of 275.49% compared with the previous year.

2.2 Current status of accessible tourism development in Mount Tai Scenic Area

In recent years, Mount Tai Scenic Area has made active efforts in the construction of accessible tourism, which has to some extent enhanced the experience for all visitors. It is primarily reflected in the following aspects:

Firstly, emphasis has been placed on the development of service facilities for visitors with special needs. Mount Tai Scenic Area offers specialized reception services for blind tourists with mobility challenges, including dedicated entry channels for individuals with disabilities and the elderly at the Tianwai Village Visitor Center, along with necessary assistance and guidance services. The scenic area has also added accessible pathways in areas with fewer slopes and steps at various visitor centers to facilitate wheelchair access.

Secondly, efforts have been made to advance the construction of the “Smart Tourism One-Stop Network”. The development of this network has made it more convenient for all visitor groups, especially individuals with disabilities, to explore the scenic area. The implementation of a certificate-free ticket purchase and checking system has streamlined the ticket purchase and checking process for preferential groups.

Thirdly, innovative exploration has been conducted to create a “Proof-Free Smart Scenic Area”. Mount Tai Scenic Area has innovatively explored a new “proof-free” smart service model, integrating and sharing data resources to replace documentary verification with data validation, thereby simplifying procedures for tourists. Through the innovative application of a “Scenic Area Code”, tourists can enter the mountain by scanning the code without needing their ID cards, significantly enhancing the convenience of sightseeing.

3 Empirical analysis of accessible tourism at Mount Tai Scenic Area

Questionnaire surveys and in-depth interviews were conducted, primarily targeting special groups (such as individuals with disabilities, the elderly and children), to understand and analyze the accessible tourism experience in Mount Tai Scenic Area. The aim was to provide a basis for the development of accessible tourism in mountain-based scenic areas.

3.1 Questionnaire survey on accessible tourism in Mount Tai Scenic Area

To comprehensively assess the development

of accessible tourism in Mount Tai Scenic Area, a questionnaire survey was conducted from the perspective of tourists. The questionnaire comprised 20 questions, primarily focusing on the usage and satisfaction levels regarding the barrier-free facilities in Mount Tai Scenic Area. A total of 650 questionnaires were distributed both online and offline, with 601 responses collected and 562 valid responses retained. The survey yielded the following conclusions:

(1) Regarding the demand for barrier-free facilities: 80% of tourists expressed a need for barrier-free facilities during their visit, while 79% indicated a requirement for handrails, guidance ropes, and similar aids. Additionally, over 50% of respondents highlighted the need for wheelchair ramps, barrier-free restrooms, and barrier-free pathways. These findings underscore the necessity of enhancing accessible tourism infrastructure at Mount Tai.

(2) Regarding satisfaction with the construction of barrier-free facilities: 48% of tourists expressed dissatisfaction with the barrier-free facilities at Mount Tai, while 22% reported a generally satisfactory level (Fig.1). 53% of tourists believe that the lack of barrier-free facilities in Mount Tai Scenic Area has led to a certain impact on their visit, 31% consider that the deficiency in barrier-free facilities does not pose significant obstacles, and 16% feel that the inadequacy of barrier-free facilities has caused considerable difficulties, adversely affecting their overall experience in the scenic area (Fig.2).

3.2 In-depth interview survey on barrier-free facilities in Mount Tai Scenic Area

In-depth interviews were conducted with vulnerable groups who have previously climbed Mount Tai, including visually-impaired individuals, individuals with physical disabilities, hearing-impaired individuals, the elderly, and children. The interviews were carried out through both online video calls and offline visits to assess the status of accessible tourism development in Mount Tai Scenic Area. The

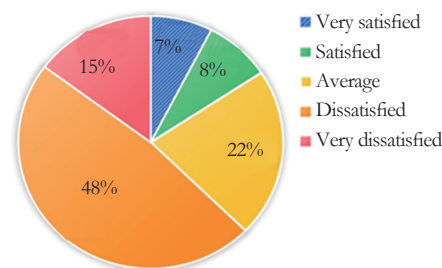


Fig.1 Tourists' satisfaction with the construction of barrier-free facilities in Mount Tai Scenic Area

findings from the interviews are as follows:

(1) Did you use any barrier-free facilities in the scenic area during your climb?

Answer: Accessible restrooms were available at major visitor service centers and along the climbing routes. The facilities were well-maintained and in good condition. In addition, handrails, guidance ropes, and accessible pathways were also used.

(2) Did you encounter any difficulties during your climb?

Wheelchair users: When entering the mountain at Tianwai Village Visitor Center and when accessing the Zhongtianmen Bus Station, no accessible pathways or their signs were found. The informational indicators within the scenic area were not prominently placed.

Visually-impaired visitors: Wheelchair-accessible pathways within the scenic area require advance reservations, which is somewhat inconvenient. A small number of grassroots staff were unclear about the accessible pathways at the visitor centers. At Tianwai Village, they encountered a situation where the accessible restroom was closed. The path from Tianjie to Yuhuang Peak is not particularly smooth, making blind canes less effective. Additionally, the signage for restrooms along Tianjie Street was not very clear.

Hearing-impaired visitor: During the visit, there were some intersections and hazardous areas with signs and warnings, but they only contained text arrows and warnings. Hearing-impaired individuals indicated that they faced difficulties in navigating directions and could not identify whether an area was dangerous. There were no staff members arranged to provide guidance.

Elderly visitors aged 60 and above: The restrooms in the scenic area are relatively clean, with well-maintained facilities and services. Some elderly individuals with limited mobility mentioned that they required assistance when boarding the shuttle buses, especially when accessing the cable cars, where extra caution

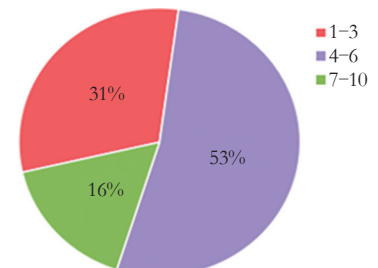


Fig.2 Obstacles caused by the lack of barrier-free facilities to tourists

was needed. However, this did not hinder their overall visit experience.

(3) Were the staff at Mount Tai Scenic Area able to address your special needs during the visit?

Wheelchair users: The scenic area staff provided relatively adequate service. When boarding the shuttle bus, the staff assisted in lifting the wheelchair. If queuing was inconvenient, seeking help from the staff would result in the opening of an accessible channel for direct ticket checking.

4 Problem diagnosis and improvement suggestions

As a 5A-level scenic area, Mount Tai Scenic Area generally poses minimal barriers to vulnerable groups. However, there is still room for enhancing humanistic care and continuously improving tourists' satisfaction with the services provided at Mount Tai Scenic Area through attention to details.

4.1 Diagnosis of accessible tourism development issues at Mount Tai Scenic Area

A comprehensive analysis reveals that Mount Tai Scenic Area still has shortcomings in barrier-free facilities, services, and management. The specific issues are as follows:

4.1.1 Barrier-free facilities and services in the scenic area.

(1) Absence or narrowness of accessible pathways: The steps leading to the Hongmen Ticket Office lack accessible ramps. The passageways at the Tianwai Village Ticket Check, Zhongtianmen Ticket Check, and Hongmen Ticket Office are too narrow, preventing wheelchair users from passing through and severely restricting their freedom of movement.

(2) Absence of handrails on stairs at visitor centers: The Hongmen Visitor Center, Tianwai Village Visitor Center, and Zhongtianmen Visitor Center lack handrails on stairs with three or more steps, posing safety hazards for visitors with mobility impairments.

(3) Lack of barrier-free buses: The scenic area has not equipped itself with barrier-free sightseeing vehicles that meet the requirements of visitors with accessibility needs, which restricts the touring experience for some tourists.

(4) Incomplete signage information in the scenic area: Safety warning signs fail to provide both visual and auditory alerts, which may pose safety risks for visitors with visual or hearing impairments. Additionally, the absence of tactile paving guidance at various visitor centers, bus stations and cable car stations makes it difficult

for visually impaired visitors to navigate the area independently.

4.1.2 Accessibility management in the scenic area.

(1) Incomplete design of barrier-free routes: The barrier-free tourist routes have gaps and are not interconnected with accessible parking spaces, which restricts the touring range for some visitors.

(2) Lack of accessibility service training: There is an absence of staff providing accessibility services along the routes, making it difficult to offer effective assistance and support to elderly and disabled visitors, among others.

(3) Closure of accessible passages: The accessible passages at Tianwai Village Visitor Center are closed and can only be opened with prior appointment, which increases inconvenience for wheelchair users.

4.2 Suggestions for improving barrier-free facilities and services at Mount Tai Scenic Area

4.2.1 Suggestions for improving barrier-free facilities. The passages at ticket gates and ticket offices should be widened to ensure smooth access for wheelchair users. New or renovated accessible pathways should be provided to facilitate the movement of tourists with special needs. Handrails should be installed along routes leading to the visitor center to assist visually impaired visitors and those with limited mobility. Stairs with more than three steps inside the visitor center should be equipped with handrails to reduce safety risks. Accessible buses can be improved with the installation of ramps to assist passengers in boarding smoothly. It is necessary to set clear and comprehensive accessibility signage systems throughout the scenic area, indicating accessible restrooms, pathways, and service points, ensuring that visitors can easily locate these facilities. Safety alert areas should incorporate both visual and auditory warning signals to mitigate risks for visitors with visual or hearing impairments. Accessible restrooms must be maintained in an open state, and pathways leading to them should be kept clear of obstructions.

4.2.2 Suggestions for refining accessibility management in the scenic area. Accessible passages should be maintained year-round with dedicated personnel available for assistance. Accessibility service points ought to be established within the scenic area to provide essential assistive devices, such as wheelchairs and crutches, while ensuring staff members are capable of delivering effective support. It is also important to enhance barrier-free training programs for the scenic area's service personnel to ensure efficient assistance

and support for individuals with special needs. Efforts will be made to enhance the promotion of accessibility information through websites, brochures, signage, and other means, ensuring that visitors in need can obtain relevant information in advance and make necessary preparations. A feedback mechanism will be established to collect comments and suggestions from visitors, enabling continuous improvements based on their input.

5 Development strategies for accessible tourism in Mount Tai Scenic Area

To implement the relevant national and Shandong Provincial policies on promoting accessible tourism and ensure the comprehensive implementation of accessible tourism at Mount Tai Scenic Area, following targeted strategies are proposed:

5.1 Establishing an information-oriented service system

It is necessary to increase the number of accessible signage and provide clear prompts in visible locations, ensuring warnings include both auditory and visual cues. Eye-catching accessible signs should be designed, including Braille signs, voice prompts, and graphical symbols, to ensure visitors with diverse needs can easily identify them. Accessible signage can be installed at key locations throughout the scenic area, such as entrances, rest areas, and restrooms, to ensure visitors can quickly locate the facilities they need. Modern information technologies, such as augmented reality (AR) and virtual reality (VR), will be utilized to provide visitors with a more immersive and interactive accessible information experience. For visitors with special needs, accessible guided tour services will be offered, featuring detailed explanations and guidance to ensure they can fully appreciate the natural landscapes and historical culture of the scenic area.

5.2 Enhancing awareness and skills in accessibility services

Public awareness among both visitors and staff regarding the importance of accessibility will be raised, encouraging broader participation in the development of an accessible environment. A promotional plan will be developed to advance accessible tourism at Mount Tai Scenic Area through various channels, including social media, official websites, and outdoor advertising. Collaboration with travel agencies will be established to promote accessible tourism products and attract more visitors with

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and global scales. The final conclusion is as follows: (i) at the individual scale, the most important indicators affecting development potential are attention, relevance, and supporting degree. At the global scale, the most important indicators affecting development potential are attention, differentiation, and relevance. (ii) The top five red tourism resources in Nanchang City with the highest comprehensive scores are: Mao Zedong Thought Victory Museum, Bayi Square, Fang Zhimin Patriotic Theme Education Exhibition Hall, Fang Zhimin Martyrs Cemetery, and Bayi Uprising Memorial Hall; the three counties with the highest comprehensive scores are: Donghu District, Xihu District, and Qingshanhu District. (iii) Among the red tourism resources in Nanchang City, only a small portion have a high level of development potential, while the development potential of most individuals and counties is at a moderate level. Moreover, individuals and counties adjacent to the city center generally show more significant development advantages.

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special needs. Training programs on accessible tourism will be conducted to enhance the service skills of scenic area staff, enabling them to better understand and address the needs of individuals with disabilities and other visitors requiring special assistance.

5.3 Improving feedback mechanisms and continuous enhancement

A visitor feedback mechanism will be established to collect opinions and suggestions from tourists with special needs, enabling timely adjustments and optimizations to accessibility services. Regular accessible tourism experience activities will be organized, inviting individuals with special needs to participate and evaluate the barrier-free facilities and services from their perspective. Periodic inspections of the maintenance status of barrier-free facilities will be conducted, with damaged facilities promptly repaired to ensure the continuity of accessibility services.

5.4 Strengthening collaboration in the field of accessibility development

Cooperation with local disability organizations, accessible tourism experts, and other relevant institutions will be strengthened to jointly promote the development of accessible tourism. Accessible cultural activities, such as barrier-free art exhibitions and concerts, will be organized to attract and serve a broader range of visitors. Applying for accessible tourism certification will be considered, which can not only enhance the scenic area's reputation but also serve as a symbol of its commitment to accessibility services.

Through the implementation of the above development strategies, Mount Tai Scenic Area will be able to provide more comprehensive and humanized accessible tourism services, meeting the needs of diverse visitors, enhancing the overall image and competitiveness of the scenic area, and promoting social inclusivity and the sustainable development of the tourism industry.

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