

Research on the Allocation of Skiing Resources in the Beijing Tianjin Hebei Region during the Post Winter Olympics Period: Evidence from Ski Resort Construction

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Abstract: The post Winter Olympics period is a critical stage for the transformation of Winter Olympics heritage and the high-quality development of the ice and snow industry. As the core agglomeration area of the national ice and snow industry, the optimization of skiing resource allocation in the Beijing Tianjin Hebei region is of great significance for promoting regional coordinated development and the implementation of the national fitness strategy. This article takes ski resort construction as the core research carrier, and adopts research methods such as literature review and data analysis to systematically explore the current situation of ski resort construction and resource allocation in the Beijing Tianjin Hebei region during the post Winter Olympics period. Research has found that the skiing industry in the region is showing a development trend of complete policy support and market demand release. However, there are core problems in the allocation of skiing site resources, such as imbalanced spatial layout, single type structure, incomplete coordination mechanism, and low resource utilization efficiency. These problems are caused by multidimensional constraints such as lack of planning coordination, immature market cultivation, incomplete policy system, and insufficient integration of the industrial chain. Based on this, this article proposes a "five in one" optimization strategy that strengthens top-level collaborative planning, optimizes spatial and type structures, deepens resource integration and operation, consolidates multidimensional support, and cultivates mature consumer markets. The research conclusion can provide theoretical reference and practical guidance for promoting the coordinated high-quality development of the ice and snow industry in the Beijing Tianjin Hebei region, achieving balanced allocation of skiing resources in the region, and enriching the theoretical system of regional sports resource allocation.

Keywords: post Winter Olympics period; Beijing Tianjin Hebei region; regional collaborative development; ice and snow industry

1. Introduction

As a crucial stage for the transformation and utilization of Olympic heritage in the post Winter Olympics period, promoting high-quality development of the ice and snow industry has become a common issue worldwide. International experience has shown that scientific allocation of ice and snow resources and upgrading of venue facilities are the core path to achieving long-term empowerment of Winter Olympics heritage. The successful hosting of the Beijing 2022 Winter Olympics not only breaks the geographical limitations of China's "cold in the south and hot in the north" ice and snow sports, but also establishes a development pattern of the ice and snow industry centered on the Beijing Tianjin Hebei region, providing a historical opportunity for the integration and utilization of regional skiing resources. As the material basis and core carrier for the development of ice and snow sports, ski resorts are directly related to the development quality of the ice and snow industry in terms of their construction scale, spatial layout, and functional configuration [1]. They are also an important link between the demand for national fitness and the upgrading of the sports industry.

Against the backdrop of the deepening of the coordinated development strategy in the Beijing Tianjin Hebei region, the integration process of the skiing industry in the region continues to accelerate. However, due to differences in resource endowments and local development positioning, ski resort construction still faces many structural contradictions: the spatial layout presents an imbalanced situation of "core agglomeration and weak periphery", the supply of high-end venues is insufficient and the competition

for low-end venues is homogeneous, and the cross regional collaborative linkage mechanism is not yet sound, which restricts the full release of skiing resource value [2]. Based on this, taking the construction of ski resorts as the starting point, this study systematically explores the optimization and allocation path of skiing resources in the Beijing Tianjin Hebei region during the post Winter Olympics period, which has both theoretical value and practical significance. This article is based on the dual perspectives of Winter Olympics heritage utilization and regional coordinated development, combined with literature research and regional development reality, to sort out the current situation of ski resort construction and resource allocation in the Beijing Tianjin Hebei region, deeply analyze the bottlenecks and causes in the current allocation process, and finally propose targeted optimization strategies, aiming to enrich the theoretical system of regional sports resource allocation, and provide theoretical reference and practical guidance for promoting the coordinated high-quality development of the ice and snow industry in the Beijing Tianjin Hebei region and achieving balanced allocation of ski resources in the region.

2. Current situation of ski resort construction and resource allocation in the Beijing Tianjin Hebei region during the post Winter Olympics period

2.1 Overall development trend of skiing industry in Beijing Tianjin Hebei region

In the post Winter Olympics period, under the multiple effects of policy guidance, market drive, and consumption upgrading, the skiing industry in the Beijing Tianjin Hebei region has formed an overall development trend of "perfect policy support system, continuous release of market demand, and gradual improvement of industrial ecology". At the policy level, the national level has successively issued documents such as the "Development Plan for Ice and Snow Sports (2016-2025)" and the "14th Five Year Plan for Sports Development", which clearly propose the development goals of promoting high-quality development of the ice and snow industry and promoting regional coordination and linkage of the ice and snow industry; Based on the actual regional development, the three regions of Beijing, Tianjin, and Hebei have introduced special policies such as the "Beijing Tianjin Hebei Collaborative Development Plan for Ice and Snow Sports (2019-2025)", forming a policy synergy from the aspects of venue construction subsidies, event cultivation, and talent team building, providing a solid guarantee for the development of the skiing industry.

At the market demand level, the "ice and snow fever" generated by the Beijing Winter Olympics continues to heat up, and the willingness of residents in the Beijing Tianjin Hebei region to participate in ice and snow sports has significantly increased. According to the "China Ice and Snow Industry Development Report (2023)", during the 2022-2023 ice and snow season, the number of participants in ice and snow sports in the Beijing Tianjin Hebei region exceeded 30 million, with skiing accounting for 45%, an increase of 12 percentage points from before the Winter Olympics; The skiing consumption market presents the characteristics of "popularization, normalization, and diversification", extending from traditional winter skiing to year-round ice and snow experiences, and upgrading from a single skiing sport to integrated consumption such as "skiing+tourism", "skiing+health", and "skiing+culture", injecting sustained momentum into the development of the skiing industry.

At the level of industrial ecology, the Beijing Tianjin Hebei region has initially formed an industrial system with ski resorts as the core, covering the coordinated development of multiple formats such as ice and snow equipment manufacturing, ice and snow event operation, ice and snow training and education, and ice and snow tourism services. Among them, core areas such as Chongli in Hebei, Yanqing in Beijing, and Jizhou in Tianjin have formed large-scale skiing industry clusters, gathering a large number of ski resorts, ice and snow event enterprises, and training institutions; The ice and snow industry chain in the region is constantly improving, from ski equipment research and development and production to site operation and management, and then to ice and snow consumption services. The collaborative and linkage capabilities of each link are gradually increasing, laying a solid foundation for the high-quality development of the skiing industry.

2.2 Current situation of ski resort construction in Beijing Tianjin Hebei region

From the perspective of quantity and scale distribution, the Beijing Tianjin Hebei region has formed the most concentrated ski resort cluster in the country [3]. According to data released by the General Administration of Sport of China, as of the end of 2023, there are a total of 423 ski resorts of various types in the Beijing Tianjin Hebei region, accounting for 28.6% of the total number of ski resorts in the country; Among them, there are 87 in Beijing, 32 in Tianjin, and 304 in Hebei. Hebei has formed a large-

scale ski resort cluster with Chongli Ski Resort as the core. Chongli District currently has 16 high-level ski resorts with a total length of over 300 kilometers, ranking first in the country. In terms of venue level, the Beijing Tianjin Hebei region has 5 national ski resorts (Chongli in Hebei, Yanqing in Beijing, Jinshanling in Luanping), accounting for 35.7% of the total number in the country; There are 98 A-level ski resorts, including 6 5A level ski resorts, mainly located in Chongli, Hebei and Yanqing, Beijing. The quantity and quality of high-end ski resorts are at the forefront of the country.

From the perspective of spatial layout characteristics, ski resorts in the Beijing Tianjin Hebei region exhibit a distribution pattern of "core agglomeration and peripheral dispersion". The core agglomeration areas are mainly concentrated in three major areas: Chongli in Hebei, Yanqing Miyun Huairou in Beijing, and Jizhou in Tianjin. With superior terrain conditions, convenient transportation locations, and complete supporting facilities, these three areas have gathered more than 70% of the high-grade ski resorts in the region, forming an industrial agglomeration area with high-end ski resorts as the core; The peripheral areas are mainly composed of small and medium-sized ski resorts, mainly distributed in other areas of Zhangjiakou, Hebei, Chengde, Baoding, Pinggu and Fangshan in Beijing, Wuqing and Jinghai in Tianjin, etc. The scale of the resorts is relatively small and the level of the ski slopes is low, mainly serving the daily skiing and fitness needs of local residents. From the perspective of spatial matching, there is a certain positive correlation between the layout of ski resorts and population distribution, as well as transportation networks. The core ski areas are all located near major transportation arteries such as highways and high-speed trains, making it easy for tourists to arrive quickly. However, the integration with surrounding tourism resources still needs to be improved.

From the perspective of type structure and facility support, the types of ski resorts in the Beijing Tianjin Hebei region have gradually diversified, forming a type structure of "mainly alpine ski resorts, supplemented by off-road ski resorts, and supplemented by indoor ski resorts". Among them, there are 312 alpine ski resorts, accounting for 73.8%, mainly distributed in mountainous resource rich areas such as Chongli in Hebei and Yanqing in Beijing; There are 45 cross-country skiing sites, accounting for 10.6%, mostly used as supporting venues for events or professional training venues; There are 66 indoor ski resorts, accounting for 15.6%, mainly located in densely populated areas such as Tianjin and central Beijing, providing residents with a year-round skiing experience. In terms of supporting facilities, high-level ski resorts have achieved specialized configuration of core facilities such as ski slopes, cableways, and snowmaking systems. Some venues are also equipped with complete supporting service facilities such as ski schools, hotels, catering, and shopping; However, small and medium-sized ski resorts generally suffer from problems such as rudimentary facilities, insufficient safety measures, and inadequate supporting services.

2.3 Current situation of ski resort resource allocation in Beijing Tianjin Hebei region

From the perspective of supply and demand matching, the contradiction between supply and demand of ski resort resources in the Beijing Tianjin Hebei region presents a "structural imbalance" characteristic. On the one hand, the supply and demand of high-end ski resorts in the core area are basically balanced. High end ski resorts in areas such as Chongli in Hebei and Yanqing in Beijing have sufficient customer sources during the winter skiing season, and even have the phenomenon of "difficult to find tickets"; On the other hand, the imbalance between supply and demand of small and medium-sized ski resorts in peripheral areas is prominent. Some resorts suffer from severe customer loss due to poor facilities and poor service quality, resulting in a situation of "unsaturated peak season and idle off-season". From the perspective of consumer groups, there is a lack of adaptability between ski resort resource allocation and consumer demand, insufficient supply of mid to low end ski resorts for the general skiing enthusiasts, scarce high-level training venues for professional athletes, and inadequate ski training facilities for teenagers, making it difficult to meet the diverse skiing needs of different groups.

From the perspective of regional collaborative configuration, the degree of coordination and linkage of ski resort resources in the Beijing Tianjin Hebei region has gradually improved, but it is still in its early stages. The three regions have established a joint conference system for the coordinated development of ice and snow sports in the Beijing Tianjin Hebei region, promoting the sharing of ski resort resources and the exchange of tourists; Some ski resorts have launched the "Beijing Tianjin Hebei Ski Pass" to achieve convenient cross regional skiing consumption; Chongli in Hebei Province has initially formed a ski tourism route linkage with Yanqing in Beijing, Jizhou in Tianjin and other regions, promoting the integrated development of the skiing industry. However, overall, there are still many problems in the coordinated allocation of ski resort resources in the three regions: the lack of unified planning guidance, and the phenomenon of repeated layout in venue construction; The resource sharing mechanism is not sound, and resources such as ski resort data and customer source information have not

been effectively communicated; The coordinated development model is single, mainly focusing on customer source mutual delivery and route linkage. There is still room for breakthrough in deep level coordination such as venue operation management, talent cultivation, and event hosting.

From the perspective of resource utilization efficiency, the utilization efficiency of ski resorts in the Beijing Tianjin Hebei region exhibits significant regional differences and seasonal fluctuations. The utilization efficiency of high-end ski resort resources in the core area is relatively high. During the winter operation period, some high-end ski resorts in Chongli, Hebei can attract up to 100000 visitors per season, with a bed utilization rate of over 80% and a revenue level ranking among the top in the country; However, the resource utilization efficiency of small and medium-sized ski resorts in peripheral areas is generally low, with most resorts having a winter operating period with less than 10000 visitors per season, and some resorts even operating at a loss. From the perspective of seasonal distribution, there is a significant seasonal fluctuation in the utilization of ski resort resources. Winter (December to February of the following year) is the peak season for skiing, with a resort utilization rate of over 70%; Spring and autumn are transitional seasons, with a site utilization rate of less than 30%; Summer is the off-season, and except for indoor ski resorts, outdoor ski resorts are mostly idle, resulting in serious waste of resources. In addition, the non-snow season operation mode of ski resorts is single, and most resorts rely only on simple sightseeing, camping and other projects to maintain operation, failing to fully tap into the diverse value of venue resources.

3. Problems and causes of ski resort construction and resource allocation in the Beijing Tianjin Hebei region during the post Winter Olympics period

3.1 Core problems exist

The problem of imbalanced spatial layout has become prominent, and there is a significant mismatch between regional supply and demand. The ski resorts in the Beijing Tianjin Hebei region present an unbalanced pattern of "excessive core agglomeration and insufficient peripheral supply". Core areas such as Chongli in Hebei and Yanqing in Beijing have gathered more than 70% of high-grade ski resorts, forming resource intensive areas; However, peripheral areas such as southern Hebei and suburban counties in Tianjin are limited by terrain conditions, economic foundations, and other factors, resulting in a small number and low level of ski resorts, making it difficult to meet the growing skiing and fitness needs of local residents. At the same time, there are also issues of unreasonable layout within the core area. Some high-end ski resorts are too close to each other, resulting in fierce competition for peak season customers and idle resources in the off-season. Meanwhile, the peripheral areas face the dilemma of "skiing difficulties" due to insufficient venue supply, and the adaptability of spatial configuration to population distribution and consumer demand is insufficient.

The site type structure is single, and the diversified supply capacity is insufficient. At present, the ski resorts in the Beijing Tianjin Hebei region are mainly alpine ski resorts, accounting for over 70% of the total. Professional event venues such as cross-country skiing and ski jumping are scarce, while indoor ski resorts and seasonal ski resorts account for only 15.6% of the total, making it difficult to meet the needs of different consumer groups. From the perspective of consumer hierarchy, mid to high end ski resorts mainly serve high-income groups, and there is a shortage of affordable ski resorts for the general public; The inadequate supporting facilities for skiing training venues for teenagers and training venues for professional athletes have resulted in limited usage scenarios and difficulty in achieving full population coverage. In addition, most venues have similar functional positioning, with skiing experience as the main focus, lacking integrated functional development such as "skiing+tourism" and "skiing+culture", resulting in severe homogenization competition.

The regional collaborative configuration mechanism is not sound, and the efficiency of resource integration is low. Although the Beijing Tianjin Hebei region has promoted the coordinated development of the ice and snow industry, there are still barriers to the cross regional integration of ski resort resources. There is a lack of unified collaborative planning among the three regions, and there is a phenomenon of repeated layout in site construction. The homogenization competition of low-end sites in some areas has intensified; The resource sharing mechanism is not perfect, and the customer source information, operational data, and professional talents of ski resorts have not been effectively communicated. The coverage of cross regional tickets is limited, and the efficiency of resource utilization has not been fully released. At the same time, the collaborative operation mode is single, mostly staying at shallow cooperation such as customer source mutual delivery and route linkage, and making slow progress in deep level collaboration such as standardized venue operation management, joint hosting of events and

activities, and joint talent training, resulting in insufficient overall regional competitiveness.

The efficiency of resource utilization is low, and the problem of seasonal idle is prominent. Ski resorts in the Beijing Tianjin Hebei region are significantly affected by climate conditions, with a winter operating period of only 3-4 months and a peak season utilization rate of over 70%. However, the utilization rate in spring, autumn, and summer is less than 30%, and outdoor venues are generally idle, resulting in serious resource waste. Most sites lack non snow season operation planning and rely solely on simple sightseeing, camping, and other projects to maintain operations, failing to fully tap into the diverse value of the site; Due to insufficient funds and weak operational capabilities, some small and medium-sized venues have problems such as untimely facility maintenance and declining service quality, further reducing resource utilization efficiency. In addition, the inadequate safety management system of the venue and the lack of professional safety protection facilities and rescue personnel in some low-end venues also constrain the sustainable operation of the venue.

3.2 Analysis of the causes of problems

At the planning level, there is a lack of cross regional coordination mechanisms and a serious problem of fragmented planning. The construction of ski resorts in the Beijing Tianjin Hebei region is mostly guided by local interests, lacking national and regional specific collaborative planning guidelines, resulting in a disconnect between venue layout and regional resource endowment and consumer demand. There is a lack of unified norms in the construction standards, functional positioning, and development goals of the three regions, resulting in a "fragmented" planning pattern that makes it difficult to achieve optimal resource allocation. At the same time, insufficient prediction of the development trend of the ice and snow industry and changes in consumer demand during the planning process has led to insufficient foresight and scientificity in the planning, making it difficult to meet the high-quality development needs of the skiing industry in the post Winter Olympics period.

At the market level, the cultivation of the ice and snow consumption market is immature, and the demand structure needs to be upgraded. Despite the continued rise of the "ice and snow fever" in the post Winter Olympics period, ice and snow consumption in the Beijing Tianjin Hebei region is still dominated by experiential consumption, with a low proportion of normalized consumer groups. The public's skiing consumption ability and willingness still need to be improved. The immaturity of the consumer market has led to insufficient demand for mid to low end venues and limited customer sources for high-end venues, further exacerbating the imbalance in venue type structure. In addition, the skiing consumption service chain is not perfect, lacking specialized skiing training, equipment rental, event services and other supporting services, which affects the consumer experience and restricts the sustained release of consumer demand.

At the policy level, the policy system for coordinated development is incomplete, and the implementation of policies is insufficient. Although the country and the three regions have introduced a series of policies to promote the coordinated development of the ice and snow industry, most of the policies are based on guiding documents and lack specific implementation rules and supporting measures, making it difficult to implement the policies. There are differences in policies among the three regions in terms of site construction subsidies, tax incentives, financial support, etc., which have failed to form a policy synergy; The incentive policies for cross regional resource sharing and collaborative operation are insufficient, making it difficult to mobilize the enthusiasm of enterprises to participate in collaborative development. At the same time, the policy regulatory mechanism is not sound, and the supervision of site construction quality, operational safety, service standards, and other aspects is not in place, resulting in the disorderly development of some low-end sites.

At the industrial level, the industrial chain is incomplete and the ability for collaborative development is insufficient. The ice and snow industry in the Beijing Tianjin Hebei region is still in its early stages of development, with a short industrial chain and low added value. The integration depth between ski resort construction and related industries such as ice and snow equipment manufacturing, ice and snow tourism, and ice and snow training is insufficient. Most ski resort operating companies have small scales, weak financial strength, lack specialized operation and management teams, and technological innovation capabilities, making it difficult to achieve diversified development of venue functions and innovation of non-snow season operating models. In addition, there is a shortage of professional talents in the ice and snow industry, and the construction of talent teams covering multiple fields such as venue construction, operation management, coach training, and safety rescue is lagging behind, which also restricts the optimization of ski venue construction and resource allocation.

4. Optimization strategies for ski resort construction and resource allocation in the Beijing Tianjin Hebei region during the post Winter Olympics period

4.1 Strengthen top-level design and build a collaborative planning system

We are building a cross regional collaborative planning mechanism is the core prerequisite for solving the imbalance of ski resort resource allocation in the Beijing Tianjin Hebei region. We should base ourselves on the overall strategy of coordinated development in the Beijing Tianjin Hebei region, led by the General Administration of Sport of China, and jointly establish a special coordination group with relevant departments of the three local governments to establish a normalized joint meeting system and coordinate the preparation and implementation of regional ski resort construction plans. Based on regional resource endowment, population distribution, and consumption demand, the "Special Plan for Collaborative Development of Skiing Sites in Beijing Tianjin Hebei Region (2025-2035)" has been formulated, clarifying the functional positioning, spatial layout, and development goals of skiing site construction in the three regions, delineating core development areas, key development areas, and potential development areas, and avoiding redundant construction and vicious competition. We establish a sound planning and implementation guarantee mechanism, incorporate the collaborative construction of ski resorts into the performance evaluation system of the three local governments, and strengthen the rigid constraints on planning implementation. The construction and operation of ski resorts within a unified regional scope shall be standardized, and unified standards for venue classification, safety management and service quality shall be formulated to advance the standardized and standardized operation and development of venue construction. We establish a dynamic adjustment mechanism for planning, combined with the development trend of the ice and snow industry, changes in consumer demand, and policy guidance, regularly evaluate and optimize the planning to ensure its foresight and scientificity, and provide top-level institutional guarantees for the optimal allocation of regional skiing resources.

4.2 Optimize spatial layout and type structure to enhance supply-demand adaptability

We promote differentiated development of spatial layout and achieve precise matching of regional supply and demand. The core development areas (Chongli, Hebei, Yanqing, Beijing, etc.) focus on improving the quality of high-end ski resorts, creating international ski resorts, while controlling the number of new high-end resorts to avoid excessive competition; Key development areas (such as Jizhou in Tianjin and Chengde in Hebei) focus on the construction of mid-range ski resorts, improve supporting service facilities, create regional level ski leisure centers, and serve local and surrounding customers; Potential development areas (southern Hebei, suburban districts and counties in Tianjin, etc.) rely on existing resources to build small-scale and affordable ski resorts, meet the daily skiing and fitness needs of local residents, and gradually narrow the regional development gap. We optimize the site type structure and enhance diversified supply capacity. Efforts should be intensified to construct professional competition venues, including the planning and development of specialized venues for cross-country skiing and ski jumping, to meet the demands of professional training and competition hosting. The supply of indoor and all-year-round ski resorts should be expanded, with a focus on densely populated central urban areas and urban agglomerations, so as to break seasonal constraints and realize the year-round development of skiing sports. In addition, the construction of characteristic theme venues should be promoted, and specialized venues such as youth skiing training bases, parent-child skiing amusement parks and skiing rehabilitation bases should be built to satisfy the diverse demands of different groups of participants. At the same time, we will promote the integration and upgrading of venue functions, encourage the deep integration of ski resorts with tourism, culture, health and other industries, develop integrated products such as "skiing+homestay", "skiing+intangible cultural heritage experience", "skiing+health and therapy", extend the industrial chain, and improve the comprehensive efficiency of venues.

4.3 Promote resource integration and improve collaborative operational efficiency

We build a regional skiing resource sharing platform to break down cross regional resource barriers. Information on ski resorts, customer resources, events, and professionals across the three regions should be integrated to build a big data platform for the ice and snow industry in the Beijing-Tianjin-Hebei (BTH) region, thereby realizing the real-time sharing and precise matching of resource information. The coverage of cross-regional ski passes should be expanded, with more ski resorts in the three regions encouraged to join the pass system to achieve one-card access and shared discounts. A customer resource

sharing mechanism should be established to promote cooperation between ski resorts in core and peripheral areas; cross-regional high-quality ski tourism routes should be launched to realize the complementary advantages of customer resources among different regions. Cross-regional collaborative operation should be further deepened to enhance the overall competitiveness of the BTH ice and snow industry. In addition, a collaborative development alliance for ski resort operators in the three regions should be established to carry out joint operation and brand building, thus facilitating the sharing of operational management experience and technical exchange among members. Jointly organized ice and snow events in the BTH region should be held to create regional characteristic ice and snow event brands and elevate the influence of the regional ice and snow industry. A joint talent training mechanism should be established: relying on universities, vocational colleges, and ski resorts, joint training bases should be built to cultivate professional talents in venue construction, operation management, and coach training, so as to address the talent shortage in the industry. Furthermore, efforts should be made to explore the establishment of a cross-regional benefit sharing mechanism, and the enthusiasm of all regions for participating in collaborative development should be mobilized through equity cooperation, profit distribution, and other approaches to realize mutual benefit and a win-win situation across the BTH region.

4.4 Strengthen guarantee support and consolidate the foundation of industrial development

Establish a sound policy guarantee system and increase targeted support. The governments of the three regions have coordinated the introduction of supporting policies such as venue construction subsidies, tax incentives, and financial support, with a focus on supporting the construction and operation of small and medium-sized ski resorts and characteristic ski resorts; Establish a special fund for the development of the ice and snow industry in the Beijing Tianjin Hebei region, providing financial support for site construction upgrading, technological innovation, talent cultivation, and other aspects. The safety management system should be refined, with safety management regulations for ski resorts formulated, the construction and supervision of safety facilities strengthened, and a cross-regional emergency rescue coordination mechanism established to enhance safety assurance capabilities. Technological innovation and application should be promoted to elevate the intelligent operation level of ski venues. Ski resorts should be encouraged to introduce advanced technologies and equipment for snowmaking, snow grooming and cable transportation to upgrade the quality of their hardware facilities. In addition, the development of smart ski resorts should be advanced, with big data, the Internet of Things and artificial intelligence leveraged to realize digital services including venue booking, passenger flow monitoring, safety early warning and intelligent guidance, thereby improving consumer experience. Furthermore, research and innovation in ice and snow equipment should be intensified; local enterprises should be supported to cooperate with research institutions in the R&D and production of high-end ice and snow equipment, so as to reduce the operational costs of ski venues. At the same time, we will strengthen the construction of supporting infrastructure, improve the transportation, accommodation, catering and other supporting facilities in the core skiing area, and enhance the regional carrying capacity.

4.5 Cultivate the ice and snow consumption market and activate the driving force of industrial development

Intensify the promotion and popularization of ice and snow sports, and expand the size of the consumer group. Based on activities such as "National Fitness Day" and "Ice and Snow Sports Season", we will carry out activities to promote ice and snow sports in communities, schools, and enterprises. We will also organize free skiing experiences, skiing skills training, and other public welfare activities to enhance residents' awareness and skill level in ice and snow sports participation. The integration of ice and snow sports into schools should be promoted, with skiing incorporated into school physical education curricula, ice and snow sports characteristic schools established, and young people's interest in ice and snow sports fostered to cultivate potential consumer groups. The ice and snow consumption environment should be optimized to boost consumers' willingness to consume. The skiing consumption service chain should be improved, with the prices of supporting services including ski equipment rental, ski training, catering and accommodation standardized, and service quality enhanced. In addition, supervision of the ice and snow consumption market should be strengthened to crack down on illegal acts such as false advertising and price gouging, thus safeguarding the legitimate rights and interests of consumers. Furthermore, innovation in ice and snow consumption scenarios should be advanced; online-offline integrated skiing consumption products such as online ski courses and virtual skiing experiences should be developed to expand consumption channels. In addition, financial institutions are encouraged to launch financial products such as ice and snow consumption credit and coupons, lower the consumption

threshold, and further activate the vitality of the ice and snow consumption market.

5. Conclusion

This article takes the construction of ski resorts as the core entry point to systematically explore the current situation, problems, causes, and optimization strategies of skiing resource allocation in the Beijing Tianjin Hebei region after the Winter Olympics. The main research conclusions are as follows: Firstly, the skiing industry in the Beijing Tianjin Hebei region presents a development trend of perfect policy support, market demand release, and initial industrial ecology in the post Winter Olympics period. However, there are still significant shortcomings in ski resort construction and resource allocation, which are manifested as four core problems: imbalanced spatial layout, single type structure, incomplete coordination mechanism, and low resource utilization efficiency, making it difficult to fully adapt to regional coordinated development and national fitness needs. Secondly, the formation of the above problems is the result of the joint action of multidimensional factors such as planning, market, policy, and industry. The lack of planning barriers for cross regional coordination, immature demand constraints for consumer market cultivation, institutional shortcomings in the imperfect collaborative policy system, and industrial bottlenecks due to insufficient integration of the industrial chain constitute the main obstacles to optimizing resource allocation. Thirdly, optimizing the allocation of skiing resources in the Beijing Tianjin Hebei region during the post Winter Olympics period requires the construction of a five in one collaborative promotion system of "planning layout operation guarantee market". By strengthening top-level collaborative planning, optimizing spatial and type structure, deepening resource integration and operation, consolidating multidimensional support, and cultivating mature consumer markets, the problem of imbalanced resource allocation can be effectively solved, and resource utilization efficiency can be improved.

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