Athens Journal of Sports - Volume 12, Issue 4, December 2025 – Pages 229-254

Insight of the "300 Million" Strategy with the Integrated Critical Realism Conceptual Framework

*By Jingfan Zhou**

Beijing 2022 Winter Olympics kept its promise of "Engaging 300 million individuals in winter sports". However, less is known about how Beijing achieved this ambitious goal and whether this legacy could be sustained after the Games. With the integrated conceptual model combining Critical Realism (CR) and the "Three-Source" Theory, this paper analyzed the efficiency and effectiveness of the "300 Million" strategy's execution from the dimension of ideal and social reality. By adopting a qualitative approach with triangulation, we carefully examined how the three essential mechanisms impact the legacy delivery process and its relevant social sustainability before and after the Games. The findings indicate that the pre-game legacy benefits extend beyond the key stakeholders of Beijing 2022 to include the general public. However, the long-term leverage effects remain uncertain due to evolving conditions. Additionally, our results support the notion that the successes within the Chinese sports system provide adaptive lessons. For extension, this study suggests initiating an ice-breaking effort to establish bilateral pathways to ensure the successful transfer of legacy and sustain the enthusiasm of winter sports participation in the post-Games period. We anticipate that this study will bring significant inspiration to IOC`s Knowledge and Games Learning (IKL) program, while providing some references to international collaboration in terms of improving social sustainability and stimulating regional development.

Keywords: *Beijing 2022 Winter Olympics; integrated conceptual model; social sustainability; Critical Realism; Knowledge and Games Learning*

Introduction

The Winter Olympics has developed over more than a century, facing new challenges such as concerns over human rights, discrimination, and their effects on social sustainability. It is important to learn from the past of the Olympic movement regardless of the geographical and cultural distances among host nations. China impressed the world by hosting another splendid Olympics after the Beijing 2008, and 2022 Beijing Winter Olympics and keeping its promise of "Engaging 300 million individuals in winter sports". Besides curiosity about the number, many researchers have turned their eyes to the strategies, programs, and legacy delivery mechanisms behind them.

At the material and artefactual level, the "Two Implementation Outlines and Three Plans", consisted of "Implementation Outline of `Encouraging 300 Million Chinese to Engage in Winter Sports` (2018-2022)", "Implementation Outline for Beijing 2022 Winter Olympics and Paralympics", "Work and Service Plan for Beijing 2022 Winter Olympics and Paralympics", "Technology Support Service Plan for Beijing 2022 Winter Olympics and Paralympics" and "Anti-doping Work Plan for

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https://doi.org/10.30958/ajspo.12-4-4 doi=10.30958/ajspo.12-4-4

Beijing 2022 Winter Olympics and Paralympics", provide guidelines to the 7 years preparation work. At the same time, 29 crucial official sports policy documents at national and provincial levels have been published to guarantee the progressive accomplishment of the "300 Million" goal.

Different from the understanding of influential international media, the "300 Million" goal has been specified as encouraging 50 million people to directly engage in ice and snow sports for sports competitions, fitness, and recreation. Meanwhile, the "300 Million" also involves large amounts of people indirectly engaging in winter sports, such as people who participate in winter tourism festivals, work in the related industry, and watch ice and snow sports events (Winter Sports Development Plan (2016-2025) 2016).

With Specific, Measurable, Achievable, Relevant, and Time-Bound (SMART) goals, the Chinese government gave a strategic hard push to the "300 Million" program in the preparation phase of Beijing 2022 and invested large amounts of human, financial, and material resources into education and infrastructure (GAS 2016). To reach this ambitious goal, China released the geographic strategy "promoting ice and snow sports from north to south, east and west". The strategy highlighted the leading power of winter sports development in the Beijing-Tianjin-Hebei region while emphasizing the importance of the training base in the three northeastern provinces. Besides, China also put weight on expanding the talent pools in Xinjiang, Inner Mongolia, and other northwest and north China regions, which could inspire the coordinative development between north and south in terms of the dynamic growth of ice and snow sports (Winter Sports Development Plan (2016-2025) 2016).

Another essential strategy targeting maintaining winter sports enthusiasm is "promoting ice and snow sports on campuses". Until the end of 2020, China planned to establish 2000 primary and secondary schools integrating ice and snow sports into their normal curriculum. This number will reach 5000 by 2025. Besides figure skating, ice hockey, and alpine skiing, several Chinese traditional ice and snow sports, such as sled, ice skating, ice dragon boat, and ice soccer, have been prioritized in developing mass sports.

Although we have diagnosed the three crucial mechanisms in Study 1, less is known about the legacy process and deep mechanism. In order to answer the research question "How did Beijing 2022 motivate 300 million people to engage in winter sports?", we applied the integrated conceptual framework to close the aforementioned research gaps and inspect the legacy delivery process from the Pre-Games to the After-Games period.

Literature Review

Prior Research on the Topic Beijing 2022 Winter Olympics

Primarily, we searched in Scopus and CNKI to review the preceding literature on the topic of the Beijing 2022 Winter Olympics. In Scopus, there were 40 documents related to the Beijing 2022 Winter Olympics. Most studies were in the branches of medicine, engineering, environmental science, and social science, written

in English by Chinese scholars between 2015 and 2024. Medical achievement, technology advancement, and environmental sustainability have been addressed in the preceding investigations, while only Ainsworth and Sallis (2022) inspected the Beijing 2022 Olympic Winter Games` leverage on the mass sports participation of Chinese youth.

In CNKI, there were 3290 Investigations on the subject the Beijing 2022. The mainstream research is located in the branch of applied research, society development, and technical research written in Chinese by domestic academia between 2015 to 2024. The amount of publication increased fast from 2020 to 2022. There was an obvious decrease in 2023 and a quick bounce back in 2024 reached 1132 articles. National image, international communication, opening and closing ceremonies, security, and strategy analysis were the main focus of the prior studies. At the same time, there is a trend of conducting research on media and social media with the assistance of big data technology. Only 10 articles are closely related to winter sports participation, and the main discussions were in the area of physical education, while fewer investigations highlighted methodology.

Despite the large difference in the publication volume in Scopus and CNKI, most articles were issued in 2022. The events and technology-driven pattern has been diagnosed along with the influence of publication date and place. Moreover, the studies from Western scholars, especially on the mass participation legacy of the Beijing 2022 Winter Olympics remained minor.

Moreover, there has been a growing number of prior research on Beijing 2022`s "300 million" goals since 2019. Applied research and society development were the main research directions, where physical education is the niche that received the most research interest. However, the mass sports legacy delivery process still needs to be addressed. Most of the preceding research lacks the conceptual framework and quantitative data for an international comparison study.

Definition of Sustainable Winter Sports Participation Legacy

The concept of sustainability emerged in the 1960s due to environmental degradation concerns (McKenzie 2004). It was set as a goal for governments when the International Union for the Conservation of Nature (IUCN) proposed that economic growth could be harmless to the environment (Adams 2006, Opp 2017). Then this concept evolved into one concept with three major policy dimensions: environment, economics, and social well-being (Opp 2017, Paehlke 2013); in 1970. Social sustainability, which has been recognized as one of the three pillars of sustainability (The other two pillars were: economic and environmental sustainability), received relatively less research attention (McKenzie 2004, Polèse & Stren 2001). The mainstream former investigations on social sustainability addressed it from the perspective of improving quality of life, social integration, etc.

In the context of SME, sports participation legacy, which could be used as one of the crucial indicators of social sustainability, has been studied often. Although Gratton & Preuss (2008) provided a comprehensive concept of legacy as `planned and unplanned, positive and negative, intangible and tangible structures created through a sports event that remain after the event`, the complexity and diversity of

winter sports activities (Brownill et al. 2013, Byers et al. 2019) made it difficult for scholars to define and measure winter sports participation legacy. Should we count on the number of visits to ski resorts and ice rinks? Or the length of time spent at the spot and the type of winter sports activities should also be taken into consideration? Moreover, the majority of prior research concerning sports participation legacy focuses on the outcomes (For example: the increased numbers of people engaging), rather than the methods, instruments and mechanisms.

Methods

This study inspects the attitude-changing, motivation, and demographic features of Chinese who participated in winter sports activities and highlights the applicable knowledge stemmed from the three crucial mechanisms "Beneficial sports policy and economic progression", "Provision of facilities accompanying the integration of sport and education", and "Cooperative stakeholders` alliance strengthened by media power and technology".

Following the conceptual model developed in this research project, we engaged triangulation, and the Qualitative Quantitative Mixed Method to study the legacy delivery process at the `ideal layer` and `social layer`. More specifically, we applied document analysis, big data analysis methods, survey, and interview to examine the change in Chinese netizens` attitudes and consumption behaviors concerning winter sports participation from 2015 to 2024.

Big-data-based research enables academia to tailor the facts and truth according to their value assessment, entrusted theories, and demands. However, pioneering researchers, such as McFarland (2015), have revealed that the application of the found data and standard statistical processes tends to create many statistically significant effects for what may be a non-representative subpopulation. Moreover, the increasing social and political polarization could facilitate cognitive manipulation based on big data and challenge the fundamental value of science and truth.

Regarding the characteristics of Chinese winter sports development and the bias created by big data analysis methods, we also conducted surveys and interviews in the "Big Health Industry" to improve the accuracy, authenticity, and objectivity of the data. The survey and interview with a small sample size, selecting a part from a whole, addressed the importance of scientific sampling and offered additional inferences to improve public health and life qualities through winter sports participation.

Data Collection and Selection

The cumulative data from the telephone survey conducted by GAS and NBS does not depict the changes during the seven years. Therefore, we collected longitudinal data from the official website and policy documents of GAS and CWSF, the Olympic World Library, the IOC official website, NBS, International winter sports industry reports, Statista, and other confidential resources.

The cumulative data from the official survey and prior investigations haven`t provided an in-depth view of the legacy delivery process and the internal mechanisms

that determine the sustainability of this legacy after the Games. Therefore, we collected empirical and secondary data from 2015 to 2024, covering the official timeframe from the Pre-Games to After-Games legacy. For document and big data analysis, secondary data have been retrieved from the official website and policy documents of GAS and CWSF, the Olympic World Library, Scopus, CNKI, Statista, and so on. In contrast, we collected empirical data through 3 expert interviews and 60 questionnaires. The interviews and surveys aim to scrutinize the collective features, priority settings, and winter sports participation patterns of people working or studying in Chinese education, sports, and medicine who have practiced or experienced winter sports during the past 9 years.

Different indicators have been selected based on the requirements of the integrated conceptual framework and the following criteria:

Relevance: The indicators must be relevant to the research question, which is to inspect the critical mechanisms of the mass participation legacy of the Beijing 2022 Winter Olympics.

Availability: The indicators must be available from 2015 to 2024.

Reliability: The indicators must be valid measures of winter sports participation.

Data Analysis

Firstly, we independently examined each category of variables and performed descriptive analysis and thematic analysis. Then, we compared the tendencies and features of Chinese ice and snow sports engagement that have been identified by applying big-data technology and the traditional social science research method. During the process, we launched regression analysis to inspect the attitude and behavior changes before and after the Beijing 2022 around Chinese winter sports participation. Meanwhile, we engaged the Pearson r test to examine the impact of different variables on mass participation. All cut-off values followed Thomas et al.'s (2005) guidelines for small sample sizes, with statistical significance set at the 0.05 level.

Results

For the secondary data analysis, 44 documents and relative data sets have been inspected. To investigate how different stakeholders and Chinese society interacted with the winter sports policy for Beijing 2022, We collected and analyzed empirical data through 3 interviews and 60 questionnaires following the same scientific sampling concept and design.

It is worth noticing that the results of our interview and survey demonstrate the same features as the official survey conducted by the General Administration of Sport of China (GAS) and the National Bureau of Statistics of China (NBS). The interviews collected the opinions of decision-makers and senior managers on the social sustainability of Beijing 2022`s sports participation legacy and the answer rate of our survey is 58.33%, where people in the Chinese education and medicine industry gave more attention to the topics (With the answer rate of 63.33% and

66.67%). The attention distribution pattern and high answer speed of each survey (5 minutes on average, 3 times faster than expected) demonstrated the same pattern and features as we figured out through big data analysis methods. In addition, the empirical data provide more precise information about the attitude and behavior changes at ideal and social layers, fulfilling the information gaps created by media bias, population bias, and activity bias (McFarland & McFarland 2015).

Inspect Sports Policy and Economic Progression at Ideal and Social Layers

From the dimension of social reality, BOCWOG submitted the final report to the IOC in 2023 indicating that the participation rate of Chinese women is higher than men at indoor skating or skiing centers. Most Chinese participants used to experience ice sports (Wu et al. 2023), while China has been considered as one of the biggest beginners` markets at the global level with a strong policy-driven feature and significant events' leverage effects. The majority of participants were in the age group of 18-30. At the same time, the 46 million young Chinese under the age of 18 (IOC 2023), were the new power to leverage the winter sports consumption. Regarding the participation frequency, most of the interviewees (38.43% of the total) participated in winter sports 1 to 2 times per year (GAS 2022). Furthermore, 85.21% of interviewees held a positive attitude towards the holding of Beijing 2022, while 57.04% of people were satisfied with the current atmosphere and supply in support of winter sports activities (GAS 2022). However, Xinhua News, China Ski Industry, White Book, and some foreign scholars expressed their concerns about the Chinese ski business in terms of the learning process influenced by the one-off consumption pattern (Vanat 2022) and some popular fast fashion products in the Chinese winter sports market, represented by the 2-4 hours skiing package (Bin et al. 2023).

In contrast, our survey, targeting people in the "Big Health Industry" with all ages and educational backgrounds, revealed that most of them participated in winter sports during their stay at university since 2020. Skating, skiing, and snowboarding were the top 3 sports, chosen by the participants aged from 19 to 36. It is worth noticing that ice sports remained the major winter sports despite snow sports grew popularity. Despite the gender differences, the tendencies to experience diverse winter sports were the same (See Table 1).

Table 1. *Gender Difference in Relation to Sports Selection*

	Ice skating	**Skiing**	**Snow-boarding**	**Curling**	**Ice Hockey**	**Others**
Men	7	11	3	0	1	1
Women	14	9	3	0	0	1

After the hosting of Beijing 2022, BOCWOG issued new strategies and plans guiding the post-games legacy. Without the hard push from the government, maintaining and increasing mass participation largely depends on the power of the market and society. The commercial report from CHNCI first reported that 57.35 million Chinese directly engaged in ice and snow sports in 2024 (CHNCI, 2024).

The behavior adjustments started from the changes in public opinions, aesthetic sense, and value assessment.

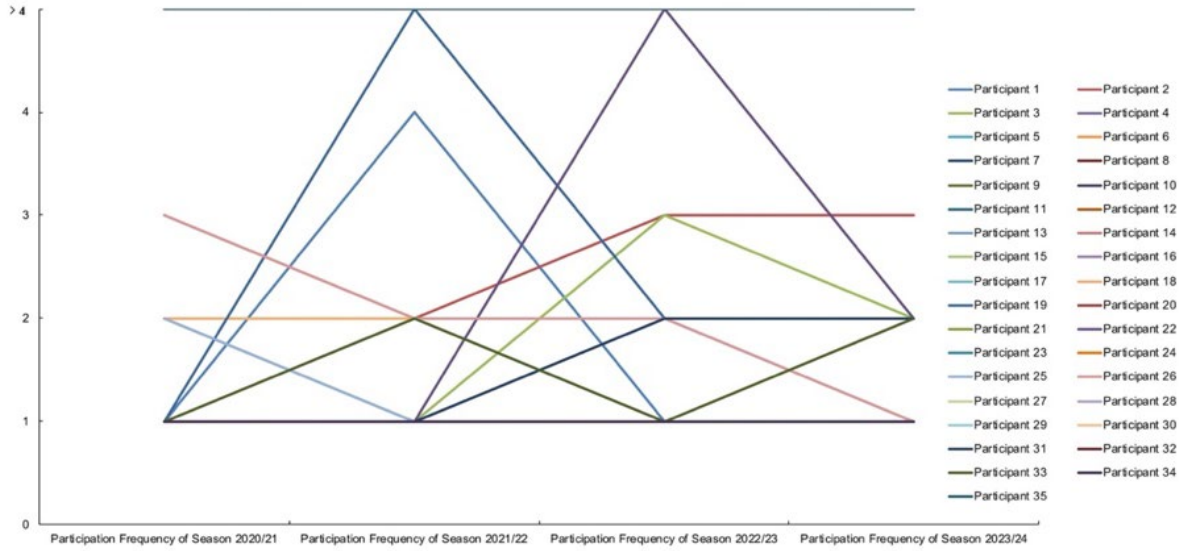
Table 2 displays that 74.29% of the participants felt happy when they first heard the "300 Million" goal, while 34.29% expressed their surprise about the target setting. After Beijing achieved the goal, the ratio of happiness increased, and the number of people feeling surprised decreased, while the most emotional changes were found in the group with bachelor's or master's degrees.

Table 2. *Participants` Reaction of Hearing the "300 Million" Goal*

First Hearing the "300 Million" Goal							
Emotion / Age	**Happiness**	**Sadness**	**Disgust**	**Fear**	**Surprise**	**Anger**	**Others**
Kindergarten	0	0	0	0	0	0	0
Primary School	0	0	0	0	1	0	0
Secondary Vocational School	0	0	0	0	0	0	0
High School	0	0	0	0	0	0	0
Tertiary and Higher Education School	0	0	0	0	0	0	0
Bachelor	13	0	0	0	5	0	2
Master	6	0	0	0	3	0	0
PhD	7	0	0	0	3	0	0
Post-doc	0	0	0	0	0	0	1
Fellow	0	0	0	0	0	0	0
Noticed the Achievement of the "300 Million" Goal							
Kindergarten	0	0	0	0	0	0	0
Primary School	1	0	0	0	0	0	0
Secondary Vocational School	0	0	0	0	0	0	0
High School	0	0	0	0	0	0	0
Tertiary and Higher Education School	0	0	0	0	0	0	0
Bachelor	14	0	0	0	3	0	2
Master	7	0	0	0	1	0	1
PhD	7	0	0	0	3	0	0
Post-doc	1	0	0	0	0	0	0
Fellow	0	0	0	0	3	0	0

Corresponding to the opinions` change, Figure 1 displays the actions taken by Chinese winter sports consumers. The target groups participated in ice and snow sports activities 2 times per season on average, and the enthusiasts practiced the selected sports more than 4 times each season. More important, our survey identified no significant changes in behavior in terms of participation frequency, before and after the host of Beijing 2022 among the target groups working or studying in the Chinese education, sports, and medicine industry. And the target groups in the Chinese "Big Health Industry" have comparatively higher levels of continuity after the hosting of Beijing 2022.

Figure 1. *Participation Frequency per Season Two Years before and after the Beijing 2022 Winter Olympics and Paralympics*



Furthermore, we identified that at the ideal reality level, the pre-game legacy benefits not only the crucial domestic stakeholders of Beijing 2022, such as Chinese national authorities, host cities, social organizations, public institutions, and enterprises, but also the international stakeholders following IOC TOP program and IOC`s Knowledge and Games Learning (IKL) program (See Table 3).

Table 3. *Stakeholders` Role and Perspectives for the Realization of the "300 Million" Goal*

Stakeholder	**Role and Function**	**Perspective and Reflects to the Sports Policy and Regulations**
General Administration of Sport and Sub-Organizations	Formulate strategies, goals and overall plans for the development of winter sports, build a national training team for ice and snow events and provide strong support in terms of talent, funds and materials.	Reflect and evaluate, formulate and revise relevant policies and regulations.
National Development and	Special inspections to meet the energy supply needs of the Winter Olympics and promote	Actively cooperate, supervise and

Reform Commission and Sub-Organizations	the resolution of related issues. Report and issue a policy document on building a higher level of public service system for national fitness, propose to strengthen the construction of infrastructure related to winter sports, and support the construction of the Ice and Snow Silk Road.	complete relevant tasks in accordance with the division of labor of the Beijing Winter Olympic Organizing Committee.
Education Ministry and Sub-Organizations	Jointly formulate policies and actively promote education-related activities such as ice and snow sports entering campuses, and provide policy, talent and funding support for the popularization of winter sports.	Co-lead the Winter Olympic-related talent training work with the sports authorities. The overall response is positive.
Industry and Information Ministry and Sub-Organizations	Strengthen communication with the Sports Bureau, promote the formation of the ice and snow industry alliance. Highlight the leading role of 5G applications to integrate scientific and technological elements into the Winter Olympics and Paralympics.	Co-lead the Winter Olympic-related science and technology and information work with the sports authorities. The overall response is positive.
Civil Affairs Ministry and Sub-Organizations	Formulate relevant policies and standards with other ministries and commissions. Promote mass winter sports. Improve the government's mechanism for purchasing public services from social forces.	The overall response is positive.
Finance Ministry and Sub-Organizations	Include eligible winter sports venues and facilities in the scope of free or low-cost opening subsidies for public sports venues; encourage financial institutions to expand financial services in the field of mass winter sports for reducing risks and guaranteeing sustainable business; encourage social capital to increase investment to mass winter sports.	The overall response is positive.
Personnel/ Human Resource Ministry and Sub-Organizations	Provide support to the Winter Olympics and Paralympics in terms of human resources.	The overall response is positive.
Land and Resources Ministry and Sub-Organizations	Cooperate in providing service and supports to sports infrastructure and facilities related to major sports events, such as the Winter Olympics and Paralympics.	The overall response is positive.
Ministry of Housing and Urban-Rural Development and Sub-Organizations	Ensure the success of the Winter Olympics and Paralympics throughout 360-degree monitoring process, ensure safe production during the Winter Olympics, participate in the work of improving urban environment and ensuring the smooth operation of transportation systems for the Winter Olympics and Paralympics.	The overall response is positive.
Water Resources Ministry and Sub-Organizations	Coordinate and guarantee the water supply for the Winter Olympics.	The overall response is positive.
Agriculture Ministry and Sub-	Ensure the quality and safety of agricultural products in the Game hosting and training	The overall response is positive.

Organizations	areas. Combine prevention and control to ensure the quality of agricultural products, reduce risks, and avoid foodborne doping.	
Culture Ministry and Sub-Organizations	Provide guidance and services related to the Winter Olympics and Paralympics` culture and tourism, create branded effects, and enable the development benefitting more people.	The overall response is positive.
People's Bank of China and Sub-Organizations	Provide financial service that guarantees the sufficient supply to the Games, and stimulate the development of ice and snow sports industry.	The overall response is positive.
General Administration of Customs and Sub-Organizations	Serve the Beijing Winter Olympics and Paralympics effectively. Ensure smooth customs clearance.	The overall response is positive.
State Administration of Taxation and Sub-Organizations	Carry out various forms of publicity and provided guidance of tax and Winter Olympics related tax policies. Besides, there is a "Winter Olympics Tax Service Hotline" offering online services, dealing with consultant in English with the remote support of a multilingual service platform.	The policy fully supports and the service fully guarantees.
State Administration for Industry and Commerce and Sub-Organizations	Take the preparation of the Winter Olympics as an opportunity to accelerate the development of the winter sports and related industries, implement the new developing concept, continuously expand high-level opening up, and actively build a new development pattern of dual circulation (Domestic and international).	Active response and comprehensive guarantee.
State Forestry Administration and Sub-Organizations	Lead the development and application of green and low-carbon technologies, together with the OC. Be responsible to safe working environment, and cooperate in forestry ecological construction.	The response is positive and the results are obvious.
National Tourism Administration and Sub-Organizations	Focus on the development of young people, guide public to participate in ice and snow sports, promote the training programs and recreational projects, organize events/ festivals to meet the diverse and multi-level demands of public (Led by market, Guide by government).	Active response, and the feedback from various regions is different.
China Insurance Regulatory Commission and Sub-Organizations	Encourage insurance companies to develop winter sports specific insurance. Guide enterprises, schools, and individuals to purchase liability insurance and other types of insurances related to sports injuries.	Active response, and the feedback from various regions is different.
Labor and Social Security and Sub-Organizations	Cultivate various talents for the Winter Olympics and Paralympics, and related industries. Strengthen the interconnection of the "Four Ye" (Manufacturing, Enterprise, Business start-up, and Employment) to increase employment and income. Innovate training ideas and enhance job competencies. Continuously improve services and pensions	Active response, and the feedback from various regions is different.

	& social security system.	
Communist Youth League of China	Promote ice and snow sports through "Sharing Winter Olympics" actions. Leverage "Protect the Mother River" environment protection acts, assisting the Winter Olympics.	Active response, and the feedback from various regions is different.
All China Women's Federation	Promote women's development and gender equality. Protect women's rights through the promotion and dissemination of winter sports.	The survey report of commercial platforms such as Tmall shows that women have made significant contributions to China's ice and snow sports and related consumption.
The China Disabled Persons' Federation	Promote the development of Parasports and protect the human rights of disabled people through the promotion and dissemination of winter sports.	Active response, and the feedback from various regions is different.
IOC and Stakeholders from Olympic Partners Programme	Provide essential guidelines and resources based on Olympic charters and host city contract.	Different stakeholders have different feedback based on their real contribution and benefits from the activities.
Stakeholders from IOC`s IKL Programme	According the actual situation of Beijing 2022, IKM developed a top-level design for all kinds of talents. IOC takes main responsibility to the knowledge management and knowledge transfer to Organizing Committee (OCOG) and the OGKM integrated into the Games from the Games planning stage to the after Games legacy stage.	Different stakeholders have different feedback based on their real contribution and benefits from the activities.

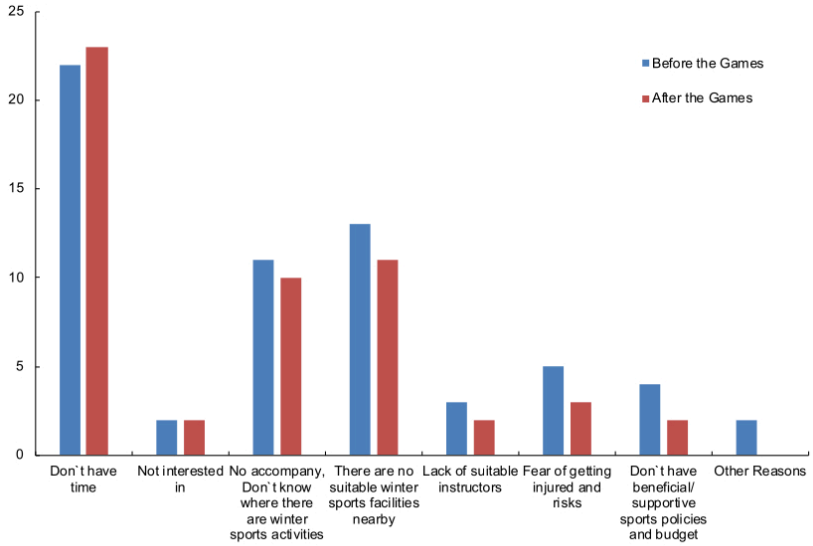
For the Post-Games consumption tendency, we interviewed leaders and experts at the decision-making level and management level for the sustainability and legacy of the Beijing 2022 Winter Olympics. An expert from GAS shared his personal view on the changing of winter sports participation after the Games, saying "After the Beijing 2022 Winter Olympics, the development of ice and snow sports will not increase rapidly in a straight line, nor decrease fast... While the development of competitive sports and mass sports tend to reach a balance… Some factors contribute to the fluctuation of ice and snow sports development… Economic development is the foundation, of course… Through the development and examination of the 2 Olympics, the amount of 300 million people involved in ice and snow sports won`t decrease." A professor in the physical education and training area from one of the main partner universities of BOCWOG remarked that the high-risk nature and some traditional senses have been the main barriers preventing Chinese consumers from directly participating in ice and snow sports.

Some leading scholars examined whether Beijing 2022 stimulated Chinese customers' needs for winter sports facilities, equipment, and services. For instance, the results of expert interviews and commercial surveys confirmed the efficient and

temporary leverage of the demands in the Pre-Games period. At the same time, the previous investigations examined that time availability, economic factors, and the living value assessment significantly influence Chinese winter sports enthusiasm after the Games. Moreover, cultural norms, consumption structures, and educational programs can either facilitate or hinder the adoption of winter sports as part of Chinese culture and national identity (Han & Zhao 2024).

In line with the mainstream voice, our outcomes also indicate that the choices and consumption patterns have been shaped by sports policy and related strategic goals expanding winter sports throughout China. Despite the comparatively higher levels of participation and continuity, we diagnosed that lack of time, suitable facilities in the range, and socioeconomic conditions prevent Chinese customers from recruiting and retaining in winter sports. And there is a correlation between each barrier before and after achieving Beijing 2022`s "300 Million" goals (See Figure 2).

Figure 2. *Barriers Deter Chinese Winter Sports Participation before and after the Achievement of the "300 Million" Goal*



Note. In the regression analysis, the r= 0.99, p= 0.01< 0.05, the coefficients= 1.73

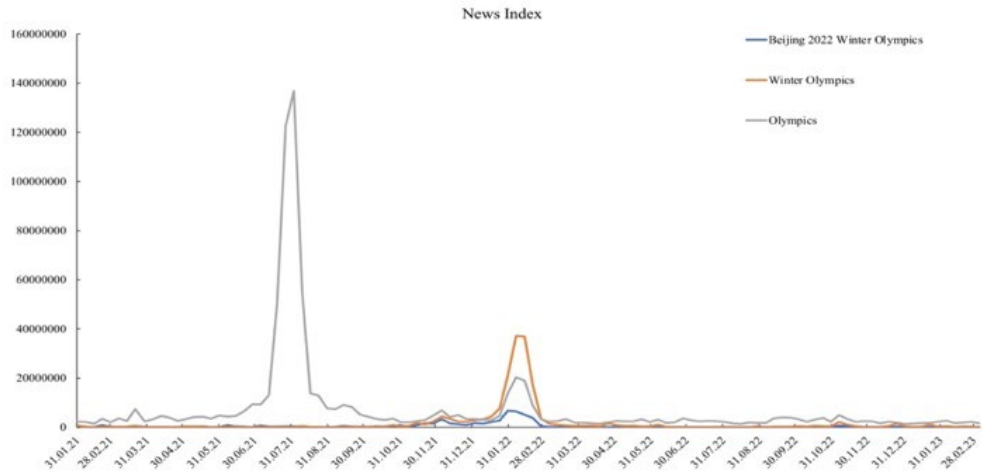
In short, our results indicate that the sports policy benefits not only the crucial stakeholders of Beijing 2022 but also the general public, while the long-term leverage effects are unpredictable due to changing socioeconomic conditions and the market equilibrium.

Impact of Winter Sports Education, Facilities and Events

Beijing 2022 fully mobilized all sectors of society to participate in the Games and took advantage of establishing training bases inside schools and universities, providing professional and international talent training, and deepening collaboration through the evolution of education and IOC`s Knowledge and Games Learning (IKL) program (Fourteenth Five-Year Plan for Sports Development 2021).

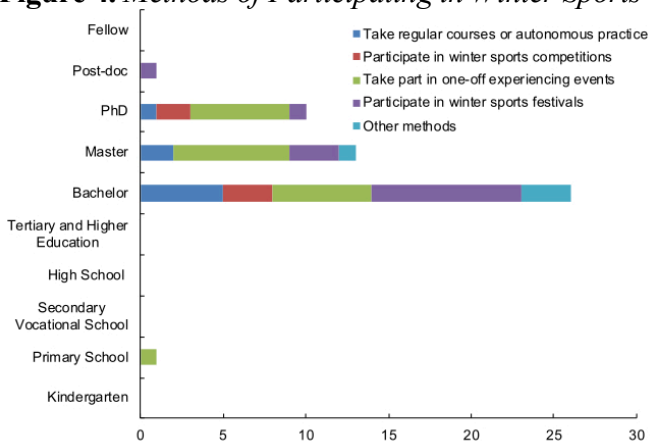
For the short-term leverage, we identified that the "festival effect" and "demonstration effect" heavily impact public opinions and Chinese winter sports development. Figure 3 displays a strong correlation between the Olympic Games schedule and the concentration of public attention.

Figure 3. *Change of Public Attention on the Topic One Year before and after the Games*



According to our survey, the majority of participants attended winter sports festivals and took part in one-off experience, while master's and bachelor`s students took more diverse methods to engage in winter sports, including committing to regular courses and autonomous practice and competing for excellence (See Figure 4).

Figure 4. *Methods of Participating in Winter Sports*



For the continuous engagement, many universities, schools, and other types of stakeholders organize science tours, educational events, industrial forums, academic conferences, exhibitions, and cultural events in the famous winter sports facilities, especially those in competition zones (BOCWOG 2022b) to inspire young people, their families, and celebrities. We verified that ice and snow sports kept catching Chinese attention after the Beijing 2022 not only in the province that undertook the

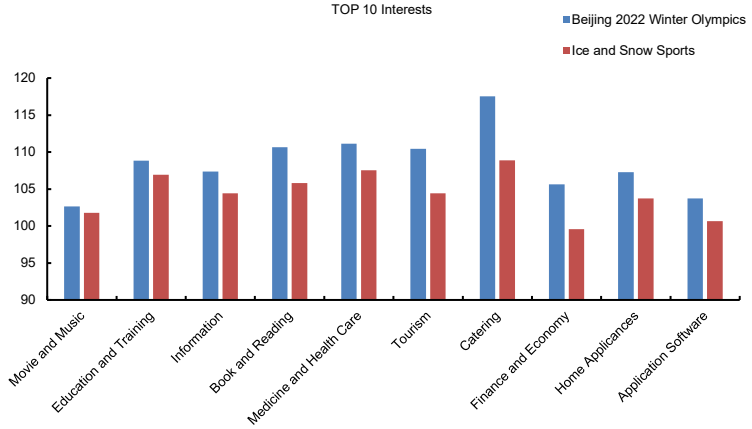
mission to develop winter sports, but also in other cities, such as Henan, Hubei and Shandong (See Figure 5).

Figure 5. *Distribution of Chinese Netizens Interested in Ice and Snow Sports*

The spreading of Chinese winter stimulated the construction of commercial ice rinks, indoor skiing areas, and the application of ski simulators. The stakeholders cooperate to build public and commercial winter sports facilities with domestic or international standards. there are non-profit venues with low access barriers, leisure facilities with various qualities owned by profit-making companies, as well as high-end facilities funded by different types of organizations for training and competition. At the same time, the Chinese government also facilitated winter sports development by offering educational and training opportunities, deduction in taxation and operating costs, and support in finance and technology (National Construction Plan for Ice and Snow Sports Venues (2016-2022) 2016). Accompanying the construction of winter sports venues, the Beijing 2022 advanced the infrastructure and public services in the areas of telecommunications, accommodation, catering, medical care, education, etc. (BOCWOG & Beijing Sports University 2022).

The supply of sports facilities should meet public demands. Our results of document and big data analysis reveal that Catering, Medicine & Health Care, and Education & Training were the main concerns influencing the consistent Chinese winter sports participation (See Figure 6). Whilst recreational motivation, fitness and well-being intention, and hobby and lifestyle ranked as the Top 3 motivations according to the official survey from GAS and NBS (GAS 2022)

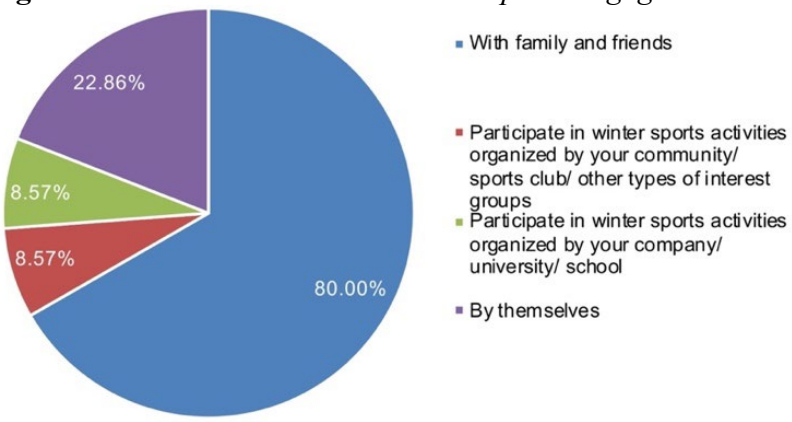
Figure 6. *Top 10 Motivation Drives Chinese Winter Sports Participation (Post-Games)*



Note. TGI reflects consumer attitudes, habits, motivations and behaviors.

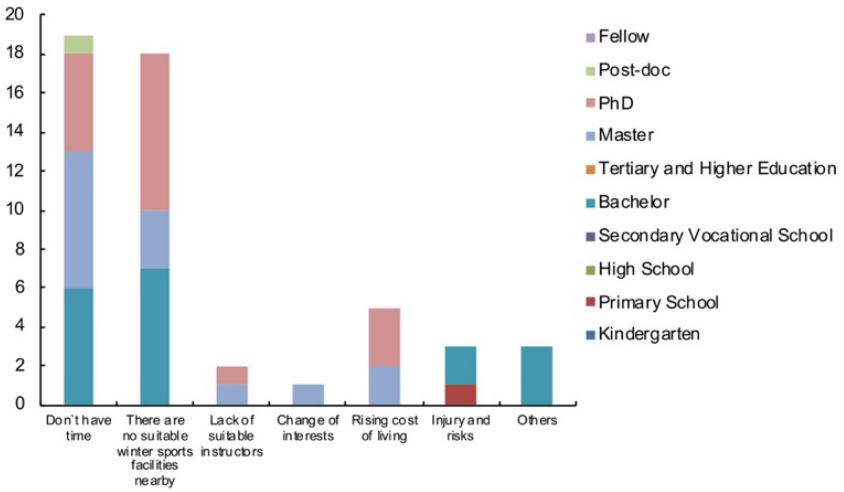
In contrast, our survey strengthened the argument that most Chinese engaged in winter sports for happiness, well-rounded development, and well-being. 80% of participants prefer to go ice and snow sports with family and friends, while about 22.86% of respondents used to practice the sports by themselves (see Figure 7). Most Chinese women were motivated by their family and friends, while the percentage of autonomous engagement was higher among the men.

Figure 7. *Social Interaction and Winter Sports Engagement Situation in China*



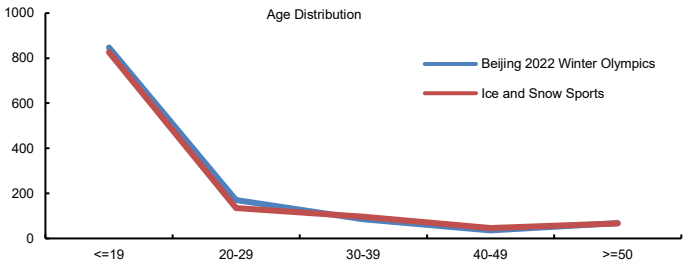
In the post-Games phase, we identified that the decrease in winter sports participation frequency is corresponding to the individual time, resources availability, and the conditions of sports facilities (see Figure 8). Besides, the most changes took place among the enthusiasts with bachelor`s and master`s degrees, where the Chinese 00s and Generation Z lead this fashion.

Figure 8. *Reasons Behind the Frequency Change after Achieving the "300 Million" Goal*



As the target group of winter sports consumption, 00s and Generation Z caught more public attention. Big data analysis revealed that Chinese young generations hold a more positive attitude towards winter sports participation after the Games (See Figure 9).

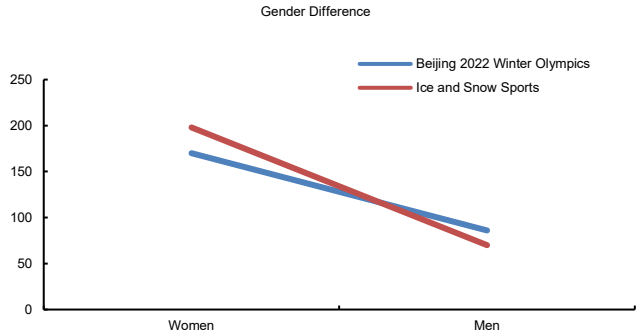
Figure 9. *Chinese Netizens Interests on 2022 Beijing Olympics and Winter Sports Categorized by Age*



Note. TGI reflects consumer attitudes, habits, motivations and behaviors.

Regarding the gender difference, Chinese women netizens show more interest in winter sports and the Beijing 2022 Winter Olympics than men (See Figure 10). This consumption tendency has also been confirmed by several international and domestic commercial reports on Chinese ski market.

Figure 10. *Chinese Netizens Interests on 2022 Beijing Olympics and Winter Sports Categorized by Gender*



Note. TGI reflects consumer attitudes, habits, motivations and behaviors.

Media and Social Media Forge the Stakeholders` Alliance

The host cities, such as Beijing, actively explore the "winter sports +" mode and drive the systematic upgrade of the ecological environment, sports tourism, winter sports culture and technology etc. The Beijing 2022 also incubated new sponsorship models closely related to branding and media presence, such as the "Joint Exclusive". PetroChina and Sinopec reached an internal agreement and became the official oil and gas partner for the Winter Olympics, together. Good initial progress in the attraction of foreign investment and introduction of technologies were achieved in the process (BOCWOG 2020).

The majority of stakeholders took Beijing 2022 as an opportunity to gain or maintain market shares, accelerate their organizations' development, and take social responsibility through organizing educational programs and sports events at winter sports spots. The knowledge management and transfer programs strengthened the stakeholders` alliance covering the scope of all three sectors, through the share of a common vision, the communication in the supply chain, as well as the engagement of diverse cooperation partners. Know-hows offered expertise through IOC`s knowledge transfer and management programs in the area of competition organizing, track building, and Games services, etc. While international experts and foreign talents helped to establish relations with organizations in Russia, Finland, and other countries (BOCWOG 2019). With their contribution, BOCWOG selected 2,878 National Technical Officers (NTOs), built more than 322 snow sports specialists and 140 ice sports specialists, and trained 1,700 experts for the Game devoted to comfortable accommodation, secured transport logistics, and medical service. At the same time, BOCWOG has created numerous job positions and recruited 36 domestic and international experts, who have been working across its 10 departments.

In cooperation with sports policy and the official knowledge management and transfer programs, media and social media provide open platforms for communication and negotiation between decision-makers and society. To have an insight view of the social demands, we use sentiment analysis assisted by the Baidu index to inspect Chinese news on the topics of the Beijing 2022, Winter Olympics, and Olympic Games. The preferences of celebrities and the government have investigated.

Table 4 demonstrated that from the Pre-Games period to the After-Games period (More specifically, from Season 2015/16 to Season 2023/24) Chinese netizens pay more attention to the specific event- Beijing 2022 than the Winter Olympics in general. Compared with Summer Olympics, Winter Olympics received less public attention. The reason was that most provinces in China have no winter sports tradition and culture.

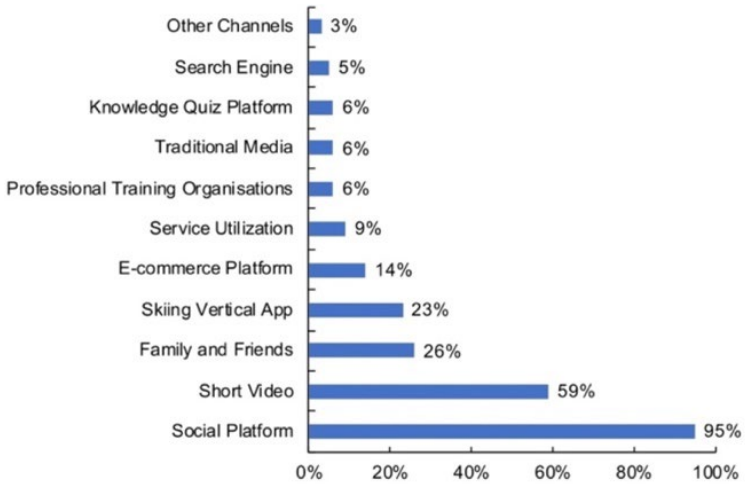
Table 4. *Search Index on the Winter Sports Participation Related Topics from 2015 to 2024*

Keywords	Overall Daily Search Index Average	Daily Search Index Average (Mobile Client)
Beijing 2022 Winter Olympics	21,307	18,266
Winter Olympics	12,296	9,765
Olympics	38,236	24,429

Note. The Season has been divided based on the fiscal year of Chinese ice and snow sports industry, which begins from 01. May of the same year and ends on 30. Apr. the next year.

For the mass participation legacy after the Games, our research highlighted that social media (Especially short video and vertical App), social networks, and E-commerce platforms empower the promotion of Skisport in China and strengthen the stakeholders` alliance (See Figure 11). Compared with the Pre-Games legacy, driven by sports policy, the After-Games winter sports participation is most likely to depend on the power of the market and society. The most popular platforms Chinese used to share their skiing experience, techniques, and tourism information are Xiaohongshu, Wechat, and Douying/Tiktok, according to big data analysis (Analysys 2024).

Figure 11. *Main Channels that Chinese Enthusiasts Applied to Capture the Skiing Related Information*



Source. Insight of Chinese Skisport`s Development 2024 (Analysys, 2024)

Discussion

The Double-Edged Swords: Beneficial Sports Policy and Resource Concentration

China has successfully increased the winter sports participation rate by age through "promoting ice and snow sports on campuses" and "promoting ice and snow sports from north to south, east and west" programs, which strengthened the foundation of mass participation by creating 835 model schools and 2,062 winter sports featured schools (BOCWOG 2022b). According to an external evaluation from Statista Research Department, the Chinese government and various stakeholders have poured around 38.5 billion U.S. dollars into the Beijing 2022, where infrastructure construction work took the biggest share (Statista Research Department 2023). The mass participation leverage highlighted efficient and sufficient sports policy and supply in the Pre-Game phase and the hosting time.

From the supply dimension, the Beijing 2022 organizers closely collaborated with stakeholders making great efforts to guarantee the success of the event and stimulate the host city's development. From the demand perspective, the general public has generally responded positively to the "300 Million" goal and related programs. However, the results also demonstrate an obvious gap between supply and demand regarding changes of sports policy and tangible social demands in the post-Games period.

Chinese central government is more likely to give power to the market and society for the winter sports engagement accompanying the further development of the winter sports industry after the successful hosting of Beijing 2022. Without the hard push of government, some tangible social demands may decrease due to unpredictable market conditions, consumers` preferences, and time/resource management strategy.

Thus, it can be summarized that the dialectic nature of beneficial sports policy, in coordination with the centralized resource allocation method, act as a double-edged sword for the long-term leverage of winter sports participation.

Sports Facilities and High-Tech to Tackle the Growing Wealth Gap

The mainstream reports and research supported the argument that the success of Beijing 2022 satisfied people's expectations for a better life by improving infrastructure and promoting winter sports education. The national education system was the primary implementation pathway for increasing winter sports participation among young people, featuring thousands of schools and universities in urban or rural areas, and providing direct communication platforms, financial resources (Chen et al. 2022), and training facilities. Besides the training bases inside schools and universities, there were indoor and outdoor commercial ice rinks and snow resorts across China. In coordination with regional development strategy, social and economic advancement, and the vision of stakeholders, different winter sports facilities choose either a profit or non-profit model.

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The non-profit model has been represented by the three northeast provinces, including He Longjiang, Jilin, and Liaoning, which have a long tradition of winter sports. Despite the advantages of public funding, they faced the common challenge of rejuvenating old industrial areas. For future development, multi-channel investment and social support have been encouraged to stimulate winter sports tourism and high-tech equipment manufacturing. The profit model grew popular in some Tier 1 Chinese cities, such as Beijing, Shanghai, and Guangzhou prioritizing the preeminent and high-end development of winter sports. With the dual-complementary modes, China obtains the great potential to maintain winter sports participation and create new socially sustainable legacies after Beijing 2022.

Besides the integration of winter sports and education, the combination of tourism and high-tech also facilitates the engagement of winter sports. Yanqing district of Beijing actively explores the "winter sports +" mode and drives the interconnected development of ecology, education, technology and other sectors. Moreover, the guesthouse industry witnessed rapid and orderly growth, creating a large number of jobs. More importantly, knowledge is the driving force that enables young people to close the wealth gaps. BOCWOG has worked closely with the IOC Olympic Games Knowledge Management team to use digital technologies and information platforms for Games knowledge management, staff training, and education (BOCWOG 2022a). These actions leave a rich legacy of volunteering and Chinese winter sports expertise after the Games.

However, several field studies indicated that there is a shortage of skiing resorts approach Western standards, despite the Beijing 2022 accelerated construction of ice and snow sports venues and the upgrade of related infrastructure. Some studies criticized that most ski areas were badly equipped and could only satisfy the needs of beginners (Vanat 2022). Thus, GAS in cooperation with the National Development and Reform Commission and the other two national-level governing bodies issued the Winter Sports Development Plan (2016-2025) (Winter Sports Development Plan (2016-2025) 2016) addressing the standardization of winter sports facilities` construction, service provision, license, and training program, and event and equipment management.

Meanwhile, winter sports education faced some challenges due to the dialectic relationship between mass and elite sports. The "Top-down" resource allocation methods and the public sector dominant legacy delivery process have unbeatable advantages in the Pre-Game period to increase winter sports engagement, especially in combat against COVID-19 (Liu et al. 2022). However, fewer studies have measured the Chinese people`s demands of winter sports in the Post-Games period,

despite leaders and experts claiming that the total number of winter sports participants kept growing during the interviews.

Regarding the official plans and reports from different provinces, we identified a pattern of the localization of the stakeholders, and the decentralization of winter sports resources, represented by the training camps and winter sports curriculum in southern cities. Moreover, some local governments of non-host cities, for example, Jiangsu, Hubei, and Tianjin put weight on multi-source funding, inter-regional collaboration, and youth/ leisure sports development; while the 3 northeastern provinces kept their elite sports orientation and stimulated the regional development with winter sports tourism and events hosting.

Coopetition among Stakeholders and Their Strategic Communication

China has the world's fastest-growing consumer market and its largest manufacturer (Armour 2022, Boykoff 2024), which served as the base of the autonomous development of Chinese winter sports industry. Meanwhile, government guidance and resource distribution plan remain the dominate powers in the development process. In the post-game period, long-term strategic plans, such as Winter Sports Development Plan (2016-2025) continually contribute to the enhancement of winter sports participation. From the SMART goals setting to the execution protocols at the central or provincial level, Beijing 2022 left various experiences in creating social sustainability benefitting from multi-layer collaboration among organizations in the public sector, private sector, and the third sector.

The platform provided by international sports mega-events attracted diverse stakeholders working together through upper and lower linkage, internal and external collaboration, expert support, and joint advancement (BOCWOG 2022b). Several Chinese enterprises, like Alibaba and China Mengniu Dairy Company, increased their global influence and competition advantages by committing to the IOC's TOP program and joining the elite network (IOC 2024).

Besides, the stakeholders` alliance and the balance of interests guaranteed the delivery of the winter sports participation legacy, while the coopetition relationship among companies in the same branches facilitates or deters individual engagement in winter sports. For example, winter sports participation is highly dependent on facilities and equipment. No matter whether services are government-purchased services or private-purchased, the 4Ps (Referring to price, product, place, and promotion) impact the tangibility of the mass participation legacy. After the Games, some stakeholders, such as venue and technology providers, continued to invest in winter sports. In contrast, other stakeholders turned their focus on different projects and opportunities. At the same time, the power and relations among stakeholders changed along with enterprises` sustainable development strategies, innovation capacities, and vulnerabilities.

Media and social media provided a broad platform for the communication and negotiation among different stakeholders and the Games host while enabling the observation and comments from the domestic and international public. We figured out a phenomenon of attitude polarization towards the Beijing 2022 Winter Olympics in both domestic and international media and social media. Chinese

scholars in communication and information branches, represented by Han S. and Hou H. (2022), remarked that mainstream media delivered positive messages about Chinese people`s support of Beijing 2022. However, Hou H. (Hou 2022) identified that foreign netizens have more negative sentiment toward the Beijing Winter Olympics corresponding to non-Olympic issues, such as China's territorial issues and other sensitive topics.

Moreover, our findings support the argument that the lessons we learn from the success embedded in the Chinese sports system are empirical, repeatable, and transferable.

Limitation, Conclusion and Future Research

This paper represents one of the evolving investigations that has taken a mixed research approach analyzing the efficiency and effectiveness of the "300 Million" strategy`s execution with an integrated conceptual model. With the combination of Critical Realism (CR) and the "Three-Source" Theory, we managed to inspect the critical mechanisms from the dimension of ideal and social reality by systematically analyzing a selected set of qualitative and quantitative data in alignment with triangulation, which employed document analysis, expert interview, survey, and sentiment analysis.

The research on ideal reality interprets stakeholders` roles and perspectives on realizing the political promise of "Creating a winter sports market with the involvement of more than 300 million people". The investigation of social reality, reflecting deep connections and generative mechanisms, will enable us to transfer winter sports participation-related knowledge among different stakeholders and institutional structures. While our findings further validate the adaptability and interconnected impact of the "300 Million" success. However, the data availability is still a discussion in this study. The current document analysis and sentiment analysis provide sufficient facts and evidence at the Macro level, especially in the Game-hosting time and post-Games period. However, less is known about the legacy delivery process in the Pre-Games period and the attitude changes before and after the Games at the meso and micro level.

In the continual pursuit of an in-depth study of Beijing 2022`s "300 Million" legacy and mechanism, we identified three general laws that could either enhance or decrease winter sports participation. The three laws involve "The Double-Edged Swords: Beneficial Sports Policy and Resource Concentration", "Sports Facilities and High-tech to Tackle the Growing Wealth Gap", and "Coopetition among Stakeholders and Their Strategic Communication".

Regarding the general laws working in any circumstances, we recommend an ice-breaking attempt to develop bilateral paths (Profitable and Non-profit) to facilitate the legacy delivery and to maintain the heat of winter sports development after the Games.

Disclosure Statement

No potential conflict of interest was reported by the author(s). And there is non-financial interest that has arisen from the direct applications of your research.

Acknowledgment

This work is part of Jingfan Zhou`s PhD research project, supervised by Prof. Athanasios Pappous.

Funding

This work was partially supported by a scholarship under the State Scholarship Fund (#202109110054) from China Scholarship Council (CSC) for the PhD programme "Science and culture of wellness and lifestyle".

Data Availability Statement

The data presented in this study is available on request from the corresponding author.

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