
Feasibility of Orienteering Development in Karst Regions: Evidence from Huaxi District, Guiyang, China

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Abstract

Orienteering is a sport characterized by distinctive training methods and a strong integration of physical fitness, cognitive skills, and environmental interaction. Since its introduction in China, orienteering has gained increasing popularity, particularly in Guizhou Province, where various comprehensive competitions have been successfully organized. However, despite Guiyang City's Huaxi District possessing significant natural and cultural advantages—such as a unique karst landform, favorable climatic conditions, rich folk traditions, tourism resources, and strong governmental support for sports development—the sustainable development of orienteering in this area still faces several challenges. These challenges include the insufficient integration of local cultural resources, inadequate risk management mechanisms, and limited promotional strategies. This study aims to analyze the feasibility and development potential of orienteering in Guiyang City's Huaxi District and to explore a development model that reflects the distinctive characteristics of Guizhou Province. A mixed-method research design was employed. The study used a literature review to examine the concept, development history, and characteristics of orienteering, along with questionnaire surveys and semi-structured interviews conducted with orienteering enthusiasts in Guiyang. The findings indicate that Huaxi District has strong feasibility for orienteering development, driven by its natural terrain, ecological environment, and policy support. Nevertheless, weaknesses were identified in cultural resource integration, safety management, and public awareness. Addressing these issues is essential for long-term development. The study implies that a localized orienteering development pathway should be established by integrating regional culture, enhancing risk management systems, and strengthening promotional efforts. These findings are expected to provide practical guidance for developing a distinctive and sustainable orienteering model in Guizhou Province.

Keywords: *Easibility Study, Guiyang Huaxi District, Orienteering*

A. Introduction

Orienteering was introduced to China from Hong Kong following the country's reform and opening-up in the last century. As living standards improved domestically, the sport gradually gained public attention. In 2004, the China Orienteering Association (COA), the largest orienteering organization in the country, was established. Since then, orienteering training has rapidly expanded across many developed cities and universities, and competitions have become increasingly common (Zhu & Wang, 2005; Xiao, 2005; Zhang & Liu, 2003).

Orienteering requires participants to navigate to specified points on a map using a compass in the shortest possible time, which demands high-quality terrain. Western China, characterized predominantly by mountainous regions—especially in provinces such as Guizhou and Sichuan—offers natural terrain well-suited to orienteering. These diverse landscapes offer rich

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terrain for competitions, making the southwestern region the most active orienteering region in China today (Gu, 2011; Xia et al., 2020; Li & Wang, 2021).

Orienteering first originated in Switzerland. It was first introduced in China in 1983 at Baiyun Mountain in Guangzhou. In 2003, it was incorporated into higher education curricula. Because it requires outdoor survival skills, physical endurance, and strong judgment and analytical abilities, it is highly popular among college students (Zhang & Liu, 2003; Chao et al., 2004; He & Tang, 2004). After years of development, today, in Guizhou Province alone, eight universities have their own orienteering clubs that train regularly and compete (Shi, 2012; Li, 2020). Among the 12 teams in the orienteering competition of the first University Games in 2006, 8 were from Guizhou Province, including Guizhou University, Guizhou Minzu University, Guiyang University, and Guizhou Medical University. Among them, the orienteering team of Guizhou Medical University in Huaxi District also won 7 gold medals, 5 silver medals, and first place in the adult group team score at the 2022 National Orienteering Championships. In recent years, Guizhou Province has actively responded to the national "Healthy China" call, using orienteering as a foundation for physical exercise and integrating the province's characteristic natural tourist attractions into competition routes, thereby designing orienteering routes with distinct features and themes, forming a distinctive orienteering sport with Guizhou characteristics (Chen, 2019; Luo, 2013; Du, 2019).

In response to Guizhou Province's current strong emphasis on promoting mass sports and developing orienteering, and given that Huaxi District in Guiyang City possesses karst landforms and climate conditions suitable for orienteering, as well as rich cultural and tourism resources, this paper takes Huaxi District as the research object. The purpose is to use the integration of orienteering and tourism in Huaxi District as a basis, combined with an analysis of the region's resources, and adopt literature review and questionnaire survey as the main research methods to investigate the current situation of public participation in orienteering, identify existing problems, and propose improvement strategies (Xia et al., 2020; Gu, 2011).

Domestic research on the development of orienteering in Guiyang City's Huaxi District is relatively limited. The feasibility analysis in this paper can enrich comprehensive research on orienteering development in Huaxi District, predict potential problems in local orienteering activities, and propose corresponding suggestions and countermeasures. It has practical significance for addressing issues such as resource integration and risk management, thereby advancing orienteering development (Luo, 2013; Du, 2019; Chen & Zhang, 2016).

B. Literature Review

Orienteering is a sport in which athletes use a topographic map and a compass to independently choose their route and visit ground control points marked on the map, as specified by the organizer. The winner is determined by either the shortest time taken to complete all control points or the highest score achieved by finding the most control points within a specified time (Zhang & Liu, 2003; Chao et al., 2004).

Orienteering training originated in the Nordic countries, particularly Sweden and Denmark. Since 1975, orienteering has become an official competitive sport, with established competition rules and technical standards. World-level major competitions are held every two years. In Sweden, orienteering is a compulsory course in schools and military training, making it an integral part of education and practice (Zhu & Wang, 2005; Xiao, 2005). Considerable research has been conducted, especially on orienteering training.

Prominent scholar Greaghu suggests that orienteering falls under endurance training, in which exercise intensity can be reflected in heart rate and lactate values. However, due to the complexity of training and competition conditions, both intensity and volume continuously change throughout the process. Many phases involve anaerobic exertion, indicating that anaerobic metabolism is also an important characteristic of orienteering. Many experts have also studied orienteering training and competition from a cognitive psychology perspective, arguing that mastering techniques is more crucial than increasing physical strength (Eccles et al., 2002; Hou, 2010).

Orienteering is an intellectually and physically demanding sport that combines elements of national defense education, competitive education, fun, and knowledge. It offers flexible forms and implementation methods. Common types of orienteering include foot, bicycle, ski, and wheelchair. Foot orienteering can be further categorized by location into: mountain orienteering, park orienteering, and campus orienteering; by time into: night orienteering and day orienteering; and by the number of participants into: individual orienteering, team orienteering, and relay orienteering, among others. The development of orienteering plays a significant role in promoting comprehensive improvements in both physical and psychological well-being among the general public. Its social, educational, and exercise values provide a theoretical basis for the widespread adoption of orienteering (Hou, 2010; Chao et al., 2004; He & Tang, 2004).

Since its introduction in China in 1993, various provinces have spontaneously organized orienteering activities, training, and competitions. After years of development, research in orienteering has become increasingly comprehensive. As orienteering gradually gains visibility among the public in China, the skill level of national teams has continued to improve, and opportunities for international competitions and exchanges have increased, thereby enhancing orienteering's international standing in China (Zhu & Wang, 2005; Xiao, 2005; Song, n.d.).

Zhang Hongbao noted in *Exploring the Development Status and Promotion Prospects of Orienteering in China* that there is no doubt that orienteering began late in China, but this does not mean its development has been slow. As national economic levels and quality of life continue to improve, people are increasingly recognizing the importance of health. Orienteering, with its advantages of enhancing physical fitness and comprehensive skills, is increasingly integrated into people's daily lives, positively contributing to human health and development. This indicates that orienteering is developing at a relatively fast pace (Zhang, 2017).

Over the 30 years since its introduction in 1993, orienteering in China has moved beyond its earlier label of "serving military training." With changes in the times and the evolution of national sports policies, orienteering has gradually come into view for schools and the public, gradually appearing in schools and mass sports. Today, orienteering has developed into a practical sport integrating intelligence, fun, and leisure entertainment, and as a comprehensive and diverse activity, it is rapidly growing (Chao et al., 2004; He & Tang, 2004).

Orienteering started late in China, but Western countries began developing it early, and it has become one of their favored activities. In the twentieth century, some countries regarded orienteering as a training program to enhance physical fitness, while others incorporated it into their educational systems, forming a comprehensive teaching framework. Today, orienteering has become an indispensable part of daily life for many

people in Western countries—both as a hobby and a lifestyle—and related scientific research achievements continue to accumulate (Eccles et al., 2002).

Although orienteering in China started late and developed rapidly with strong national support, its overall development level still lags behind that of other countries due to factors such as high injury rates, insufficient theoretical research, a lack of a comprehensive educational system, and inadequate venues and equipment. With the rapid development of leisure sports and outdoor activities, and the growing number of participants in orienteering, it is particularly important to apply sufficient theoretical knowledge to effectively integrate orienteering with Huaxi District's resources in Guiyang City and to propose scientific suggestions to address existing theoretical and practical issues (Luo, 2013; Du, 2019; Chen & Zhang, 2016).

C. Methods

This paper examines whether orienteering can be widely practiced in Huaxi District, Guiyang City. Therefore, the research object focuses on the feasibility of developing orienteering in Huaxi District. Although the area possesses rich natural, tourism, and cultural resources, further study is needed to determine whether it can meet the demands of hosting orienteering activities, integrate orienteering culture for public acceptance and participation, analyze potential challenges in implementation, and propose targeted recommendations to effectively promote the development of orienteering in Huaxi District.

Based on the research needs, relevant sports manuals, journals, books, and online resources on orienteering were consulted. A large number of domestic and international historical documents, academic works, and published research papers on orienteering training were reviewed to understand the current status of orienteering development, identify methods to address factors affecting orienteering training, and provide a reference basis for this study.

Based on the literature review and the purpose of this research, a "Questionnaire on the Feasibility of Developing Orienteering in Huaxi District, Guiyang City" was designed. The questionnaire was distributed to 200 participants who had previously taken part in orienteering activities in Guiyang. To ensure the breadth and authenticity of the data, the survey was conducted with the assistance of the Guizhou Orienteering Base. A total of 200 questionnaires were distributed, with 190 recovered and 180 valid, resulting in a recovery rate of 95% and an effective rate of 90%.

Table 1. Questionnaire Recovery Status

	Distributed	Recovered	Valid
Number	200	190	180
Percentage	100%	95%	90%%

Table 2. Survey Respondent Statistics

Age Group	18-25 years	26-35 years	36-45 years	Over 46 years	Total
Number	23	96	37	24	180
Percentage	12.7%	53.3%	20.5%	13.3%	100%

According to Table 3.2, the largest group of respondents was aged 26-35, comprising 96 people (53.3%), followed by the 36-45 age group, with 37 people (20.5%). This indicates that the current main participants in orienteering in Guizhou are young and middle-aged adults.

Additionally, the numbers of older and younger participants are very similar, suggesting that while seniors and youth are not the primary sources of participants, their proportions are balanced, reflecting a relatively widespread participation across age groups in orienteering in Guiyang City. Interviews were conducted with participants who had previously engaged in orienteering activities in Guiyang City to gain further insight into the specific situation of orienteering development in Huaxi District.

D. Results and Discussion

Analysis of Resources for Developing Orienteering in Huaxi District, Guiyang City

To conduct orienteering, the first requirement is the availability of venue resources to support the activity. Guizhou Province, where 92.5% of the area is composed of mountains and hills, features unique karst landforms with numerous mountain ranges, overlapping ridges, extensive ranges, and deep valleys. It has rich terrain, including fields, mountains, forests, and rivers. In addition to its natural outdoor resources, Huaxi District also boasts well-developed park facilities, including Huaxi Park, Forest Wetland Park, and Confucius Academy. Relying on these natural resources enables better development of orienteering activities (Gu, 2011; Xia et al., 2020; Li & Wang, 2021).

Secondly, a suitable ecological climate is essential. Guiyang enjoys a subtropical, humid, and mild climate, characterized by warm winters without severe cold, summers without extreme heat, abundant sunshine, and ample rainfall. The air is humid, and the average annual temperature is around 15.3 degrees Celsius. This climate is not only suitable for outdoor orienteering but also conducive to forest growth, helping maintain a healthy ecological environment. Therefore, Huaxi District possesses favorable climatic and geographical conditions for orienteering (Xia et al., 2020).

Lastly, map resources are critical. Maps are ubiquitous in daily life and indispensable for orienteering. During orienteering activities, athletes must navigate to control points marked on the map. Moreover, orienteering maps serve as an important parameter for evaluating orienteering resources. The richness of map resources in a region greatly influences the ease with which orienteering can be developed there. Through surveys and interviews with coaches and team members of university orienteering teams in Huaxi District, it was found that the area's orienteering maps primarily consist of campus, park, outdoor, and village/town maps, totaling 16 (Shi, 2012; Li, 2020).

Table 3. Survey Object Statistics

Type	Campus Maps	Park Maps	Field Maps	Village/Town Maps
Quantity	6	3	4	3

The campuses included in the campus orienteering maps listed in Table 3 are: Guizhou Normal University, Guizhou Minzu University College of Humanities and Science, Guizhou University of Finance and Economics, Guizhou Medical University, Guizhou University, and Guiyang University of Chinese Medicine. The park maps currently include Huaxi Park, Shili River Beach Wetland Park, and Niujiiao Island. The field maps cover Fenghuang Mountain, Shibanshao, Cherry Blossom Garden, and Yangmei Reservoir. The ancient town maps include Yanlou, Longjing, and Haohuahong.

From Table 3, it can be concluded that the main category of orienteering maps is campus maps, indicating that orienteering activities are mostly conducted on campuses. The distribution

of the other map types is relatively even. This finding suggests that higher education institutions play a dominant role in promoting and organizing orienteering activities, particularly given their structured environments, facilities, and student accessibility (Shi, 2012; Li, 2020).

Huaxi District in Guiyang City is also a multi-ethnic gathering area. The local living environments feature distinctive architectures passed down through generations. The residents possess their own unique ethnic languages, customs, and religious beliefs. These intangible cultural elements continually enrich the local tourism resources and provide additional cultural value for integrating orienteering with tourism development (Xia et al., 2020; Chen, 2019; Chen & Zhang, 2016).

Table 4. Orienteering Tourism Resources in Huaxi District, Guiyang City

Landmark Type	Attraction
Internet-Famous Landmark	Charming Night View - Little White Palace
Internet-Famous Landmark	Majestic Waterfall Building
Urban Landmark	Knowledge-Rich Confucius Academy
Urban Landmark	Eternal Classic - Jiaxiu Tower
Urban Landmark	Scenic Shili River Beach
Urban Landmark	Quiet Retreat in the Bustling City - Wenchang Pavilion

As shown in Table 4, in addition to fixed natural resources, Huaxi District in Guiyang City has sufficient internet-famous and urban landmarks that can support orienteering activities, further enriching its tourism resources. Under the national policy strongly advocating sports tourism, greater emphasis must be placed on integrating sports and tourism resources to achieve a "1+1>2" effect. With robust demand for sports tourism and the accelerated promotion of integrated "sports + tourism" development, Huaxi District in Guiyang City boasts rich tourism resources, including karst landscapes, urban landmarks, and internet-famous sites. Through flexible and varied orienteering event formats, such as fun, red-themed, and research-oriented events, these initiatives can significantly promote and accelerate orienteering's development (Chen, 2019; Chen & Zhang, 2016; Gu, 2011).

The survey on developing orienteering in Huaxi District, Guiyang City, reveals that, as a mass sport, orienteering has a strong popular foundation in Guiyang. It not only receives strong government support but is also beloved by the general public. This indicates a high level of popularity for orienteering in Huaxi District, with many people willing to try and explore it themselves. Older adults, in particular, often use it as a form of exercise. The primary venues chosen for orienteering activities are outdoor environments such as parks, forests, and suburban areas. This reflects the abundance of natural environmental resources in Huaxi District suitable for orienteering, as well as people's love for nature and desire for outdoor activities (Gu, 2011; Xia et al., 2020; Li & Wang, 2021).

Although orienteering is relatively popular in Huaxi District, there are still challenges and areas for development, such as improving risk management in competition organization and increasing promotional efforts. Issues related to safety, organization, and resource integration remain important considerations in the sustainable development of orienteering. Overall, orienteering has good market prospects and development potential (Luo, 2013; Du, 2019; Chen & Zhang, 2016).

Feasibility Analysis of Developing Orienteering in Huaxi District, Guiyang City

In recent years, the State Council has issued a series of policies encouraging people to actively participate in outdoor activities. Firstly, in 2009, the National Fitness Regulations were

introduced to improve the population's physical health. Later, in 2014, the State Council issued the Several Opinions on Accelerating the Sports Industry and Promoting Sports Consumption. The release of this document increased public and sports enthusiasts' participation in activities such as orienteering, fitness, mountaineering, and rock climbing. Compared to these activities, orienteering has a higher safety factor, greater public acceptance, and faster development speed (Chen, 2019; Zhang, 2017; Zhu & Wang, 2005).

In response to the national call, Guizhou has launched orienteering competitions suitable for national fitness goals, encouraging participation across age groups. Commemorative prizes are distributed to all participants to motivate public involvement, achieving the goal of making Guizhou "active" and the public "happy." Guizhou also encourages primary and secondary schools to promote orienteering, as it not only strengthens the body but also cultivates independent thinking and problem-solving abilities. Every university in Guizhou is encouraged to establish an orienteering association and host various forms of orienteering competitions annually to promote student participation. Additionally, personnel engaged in orienteering are encouraged to pursue further training, and society is encouraged to establish various orienteering clubs to involve the entire population in the sport, thereby promoting the development of orienteering in Guizhou (Chao et al., 2004; He & Tang, 2004; Shi, 2012; Li, 2020).

Table 5. Statistics on Knowledge of Orienteering Training

Age Group	Only Understand the Concept	Understand Concept, Rules, and Events	Understand All Aspects of Orienteering	Total
18-25 years	0	10	13	23人
	0%	43%	57%	100%
26-35 years	2	50	44	96
	2%	52%	46%	100%
36-45 years	2	10	25	37
	5%	27%	68%	100%
Over 45 years	3	11	10	24
	13%	46%	41%	100%

As shown in Table 5, most respondents have a very good understanding of orienteering training knowledge, indicating a certain level of popularity. 44 people (46%) have a comprehensive understanding, but 68% are middle-aged or elderly. It can be seen that most respondents in this age group are in a phase of declining physical strength, and understanding training knowledge is also necessary to avoid injuries during exercise.

Table 6. Statistics on Purposes for Choosing Orienteering

Age Group	Like the Sport	For Physical Exercise	To Pass Time	Other Reasons	Total
18-25 years	14	9	0	0	23
	100%	0%	0%	0%	100%
26-35 years	29	45	19	3	96
	30%	47%	20%	3%	100%
36-45 years	12	21	4	0	37
	32%	57%	11%	0%	100%

Over 45 years	5	19	0	0	24
	21%	79%	0%	0%	100%

As shown in Table 6, young people aged 18-25 greatly enjoy the sport, while middle-aged people tend to prefer it for physical exercise. Notably, no one in the over-45 age group chose "to pass time," indicating a strong public willingness to engage in physical exercise.

Table 7. Statistics on Orienteering Training Frequency

Age Group	1-2 Times/Week	Over 3 Times/Week	Total
18-25 years	10	13	23
	43%	57%	100%
26-35 years	33	63	96
	34%	66%	100%
36-45 years	12	25	37
	32%	68%	100%
Over 45 years	5	19	24
	21%	79%	100%

As shown in Table 7, respondents across all age groups generally train more than three times per week, and most are satisfied with their training frequency. This indicates that orienteering is widely popular in Guiyang, with strong public acceptance and high demand for the sport.

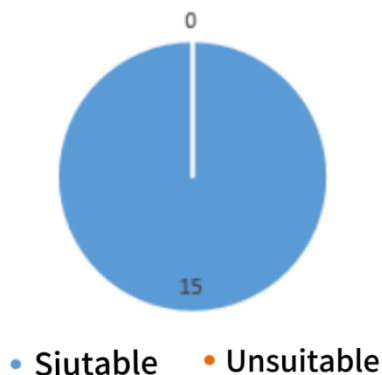


Figure 1. Is Orienteering Suitable for Promotion and Development in Huaxi District, Guiyang City

As shown in Figure 1, respondents unanimously believe that Huaxi District is highly suitable for orienteering development. Participants in orienteering in Guiyang span a wide age range, including middle school students, university students, and working professionals. Among them, young and middle-aged groups, such as university students and working adults, rate orienteering highly in terms of enthusiasm, participation frequency, and purpose. This reflects the broad social adaptability and attractiveness of orienteering as a mass sport (Gu, 2011; Li & Wang, 2021).

In summary, by analyzing resources for developing orienteering in Huaxi District, Guiyang City, and surveying respondents' understanding, training frequency, and exercise purposes, along with participants' feedback, we can conduct a feasibility analysis of local orienteering development. This helps understand the current status and existing problems of orienteering in

the region while providing references and insights for its future development (Shi, 2012; Li, 2020; Luo, 2013; Du, 2019)..

Problems in Developing Orienteering in Huaxi District, Guiyang City

The core of orienteering involves participants using maps to find control points one at a time. During its development, a unique culture has formed around overcoming oneself and challenging nature. Guizhou Province is a multi-ethnic region with cultural heritage passed down through generations, including ancient villages, towns, scenic spots, and intangible cultural characteristics. This diversity enriches local tourism resources. To understand Huaxi District's tourism resources, the analysis should be based on the geographical environment, natural resources, and venues suitable for orienteering, while also examining history, society, literature, religion, folklore, art, and other disciplines from multiple perspectives (Gu, 2011; Xia et al., 2020; Chen & Zhang, 2016).

Integrating tourism resources into orienteering requires specific methods and strategies. When planning orienteering activities, organizers must ensure basic requirements such as "control points not taking too long and avoiding overcrowding," while also considering how to incorporate the local unique culture. This allows participants to gain insights into the area during tasks and provides a unique sense of involvement. However, determining the methods, content arrangement, and integration of ideological elements poses challenges, making the fusion of orienteering culture and tourism resources difficult. These challenges are closely related to issues of resource integration, activity design, and risk management in orienteering development (Luo, 2013; Du, 2019; Hou, 2010).

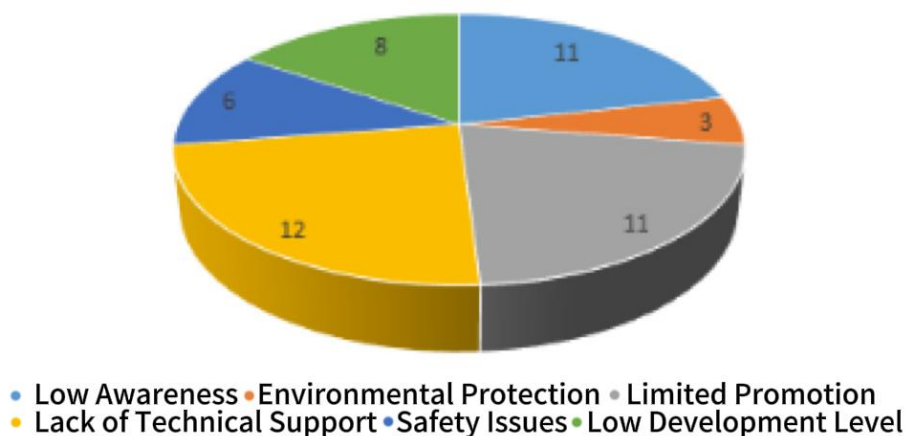


Figure 2. Factors Affecting the Development of Orienteering in Huaxi District, Guiyang City

As shown in Figure 2, low awareness and limited publicity are considered the main reasons, followed by environmental protection concerns among respondents. Although orienteering has been developing in China for many years, it has not yet fully entered the public eye. Due to the relatively high risk of outdoor sports, businesses are hesitant to promote them, and parents often restrict their children's participation. The primary reason for orienteering's development in Guizhou is strong government support, which has facilitated widespread promotion among citizens. Promotion by individuals or organizations would be difficult to achieve on the same scale. Additionally, regions such as the southeastern coastal areas and northern China are predominantly plains with limited mountains, lacking the abundant natural landscape resources

found in Guizhou. Thus, regional characteristics also limit the nationwide promotion and publicity of orienteering.

Table 8. Statistics on Factors Affecting Orienteering Training

Age Group	Affected by Transportation	Affected by Equipment	Affected by Venue and Facilities	Total
18-25 years	8	9	6	23
	34%	40%	26%	100%
26-35 years	17	19	60	96
	17%	20%	63%	100%
36-45 years	3	13	21	37
	8%	35%	57%	100%
Over 45 years	7	0	17	24
	29%	0%	71%	100%

As shown in Table 8, transportation has the least impact on respondents, as orienteering is typically conducted in mountainous areas. Venue and facilities have the greatest impact, with venue conditions being the most significant factor. This indicates that natural and physical infrastructure play a crucial role in determining the feasibility and quality of orienteering activities (Gu, 2011; Xia et al., 2020).

Risks in orienteering in Guizhou due to natural factors can be categorized into climate, terrain, vegetation, and forest distribution factors. If the orienteering venue is in the field, terrain factors pose potential risks. Guizhou is mountainous with karst topography, dense forests, and complex terrain. During orienteering, participants may risk spraining ankles, getting lost, or even falling off cliffs (Xia et al., 2020; Li & Wang, 2021).

Risks in orienteering in Huaxi District due to improper organization and management include maps that do not meet cartographic standards, poor map quality, unreasonable venue selection, route design issues, inadequate pre-race briefings, organizational errors during events, and failure to promptly handle special situations. Participants in such events may face unforeseen dangers, ranging from delays in completing routes to entering hazardous areas that threaten their safety (Luo, 2013; Du, 2019).

With the rapid development of orienteering, the number of participants has gradually increased. Some participants may lack understanding of orienteering rules and knowledge, be physically unfit, or blindly follow trends. During competitions, such participants may face serious risks such as cardiac arrest, hypoglycemia, hypothermia, or shock due to their physical condition. Additionally, some athletes may set unrealistic goals or lack basic technical knowledge, such as how to use a compass, which may lead them into dangerous situations (Hou, 2010; Eccles et al., 2002).

Route design is a critical part of orienteering, both in preparation and organization. Based on the analysis of Huaxi District, Guiyang City, developing orienteering in the area may face challenges, such as a lack of professional route planners in some regions, leading to non-standard competition routes. Issues may include unreasonable route length, excessive elevation gain, too many control points, difficult-to-find control points, and athletes being unable to complete the course within the allotted time (Shi, 2012; Li, 2020).

Orienteering is closely related to regional culture. Route design must appropriately integrate regional culture into the course, allowing participants to experience local history, culture, and natural scenery during the activity. Additionally, promoting orienteering culture is extremely

important. In the era of rapid internet development, considerations must include how to utilize digital media and select key locations to showcase athletes' performances. However, since orienteering activities often take place in outdoor environments such as forests, towns, and parks, it remains challenging to present the competition effectively to audiences. Thus, route design and cultural integration remain key challenges in the development of orienteering (Chen, 2019; Chen & Zhang, 2016).

E. Conclusion

Huaxi District, Guiyang City, possesses rich regional cultural resources and benefits from strong government support. Currently, orienteering is developing vigorously in Guiyang, but certain challenges remain. Questionnaire surveys reveal that orienteering is highly popular among the general public, with many citizens willing to participate. Although the integration of local culture with orienteering in Guiyang is relatively simplistic, and promotion relies heavily on government efforts with limited grassroots publicity, there is broad potential for further development. By a deeper exploration of cultural elements and the full utilization of rich regional cultural resources, the two can be integrated to enhance orienteering's cultural characteristics and increase the sport's appeal.

As an outdoor sport, orienteering involves finding control points in natural environments, allowing tourists to gain a deeper understanding of Huaxi District's natural scenery and cultural heritage. This not only increases tourists' awareness and interest in Huaxi but also attracts more target audiences to participate, thereby promoting the development of local tourism. Additionally, orienteering often requires guidance and organization, which can foster local residents' sports awareness and leadership skills, thereby enhancing the local tourism industry's capacity for self-development.

There is a need to improve the management and services of orienteering. Although the popularity of orienteering in Huaxi District has been increasing annually, problems such as insufficient venues, inadequate facilities, and irregular management still exist. Therefore, it is necessary to strengthen the planning and construction of orienteering venues, improve the quality and quantity of facilities, and enhance the management and services of orienteering to ensure the safety and quality of the participant experience.

Currently, orienteering is widely popular in Guiyang, with broad public participation. However, there is a lack of effective risk assessment and response plans in the organization, implementation, management, and regulation of activities. It is believed that with continued government support, the development of orienteering in Huaxi District will better meet the public's needs for physical exercise.

In the process of developing orienteering, the exploration and protection of regional culture are particularly important. It not only provides the material basis for orienteering but also enriches its connotation. Moreover, integrating culture effectively can promote the development of the local tourism industry. Therefore, efforts should be made to explore, protect, and integrate regional culture. Experts and scholars should be organized to research, discuss, and summarize, integrating orienteering with regional culture in multiple aspects. While promoting the sport, it will fully drive the development of tourism in Guizhou Province, thereby stimulating the local economy.

Currently, the Guizhou Provincial Culture and Tourism Bureau strongly supports integrating orienteering with regional culture, providing a solid foundation for orienteering in Guizhou. On this basis, orienteering-related events should be actively organized, ranging from

small competitions to large events, from single events to joint series events, and from youth events to events for middle-aged and elderly participants. Comprehensive and active promotion and publicity should be carried out to improve the competition system and increase opportunities for public participation. This will attract more participants, and internal and external communication among participants will greatly enhance the visibility and development of orienteering.

Before organizing orienteering activities, mappers should select suitable venues based on factors such as transportation conditions, climate, and vegetation characteristics, and create appropriate maps in accordance with cartographic standards. Course setters should design routes based on map characteristics. For example, larger maps with complex terrain and greater difficulty can be designed for long-distance events, and other competition conditions can be considered to determine whether they are suitable for team events. The final route design should be discussed by multiple groups and decided through continuous practice and feedback to ensure rationality, safety, timeliness, and playability. Finally, risk prediction and emergency plans should be prepared. Potential problems during activities should be roughly estimated, and multiple contingency plans should be developed to respond to dangers effectively and prevent problems before they occur. During the organization and management of activities, all staff should be assigned in a reasonable manner, and each position should be trained to ensure that staff have sufficient skills to organize and regulate their respective areas, fully leveraging the supervisory role beyond the athletes.

References

- Chao, F. X., Chen, H. D., & Wang, C. Q. (2004). Dingxiang yundong zai woguo xuexiao tiyu zhong de kaizhan xianzhuang ji fazhan duice yanjiu. *Shandong Tiyu Xueyuan Xuebao*, 20(5), 2.
- Chen, H. P. (2019). “Jiankang Zhongguo” zhanlüe beijing xia Guizhou dingxiang yundong fazhan yanjiu. *Tiyu Shijie (Xueshu Ban)*, (11), 26–24. <https://doi.org/10.16730/j.cnki.61-1019/g8.2019.11.014>
- Chen, M. L., & Zhang, W. Q. (2016). Jiangxi sheng fazhan dingxiang yundong de kunnan ji duice. In *Proceedings of the First “Quanmin Jianshen, Kexue Yundong” Academic Conference. Jiangxi Tiyu Kexue Xuehui.*
- Du, Q. F. (2019). Dui quanmin jianshen beijing xia huwai dingxiang yundong fengxian guanli fenxi. *Tiyu Fengshang*, (4), 1.
- Eccles, D. W., Walsh, S. E., & Ingledew, D. K. (2002). The use of heuristics during route planning by expert and novice orienteers. *Journal of Sports Sciences*, (4).
- Gu, H. Y. (2011). Guizhou gaoxiao kaizhan dingxiang yundong de yiyi ji kexingxing tantao. *Kejiao Daokan (Zhongxunkan)*, (6), 173–174.
- He, X. Z., & Tang, W. H. (2004). Hunan sheng tuiguang puji dingxiang yundong de kexingxing fenxi. *Tiyu Chengren Jiaoyu Xuekan*, 20(2), 2.
- Hou, Z. R. (2010). Dingxiang yundong shehui jiazhi yanjiu. *Tiyu Wenhua Daokan*, (7), 6–8.
- Hu, X. (2013). Dingxiang yundong zai shequ tiyu yundong zhong puji de kexingxing tantao. In *Proceedings of the National School Orienteering Academic Seminar.*
- Li, C. (2020). Heilongjiang sheng kaizhan quanyu dingxiang yundong de kexingxing yanjiu [Master's thesis, Harbin Normal University]. <https://doi.org/10.27064/d.cnki.ghasu.2020.000902>
- Li, T., & Wang, X. X. (2021). Guizhou sheng tiyu chanye zhengce fazhan de yanjiu. *Tiyu Keji*, 42(3), 96–98.

- Luo, G. (2013). Quanmin jianshen beijing xia huwai dingxiang yundong fengxian guanli yanjiu. *Wenti Yongpin Yu Keji*, (20), 1.
- Shi, X. Y. (2012). Guizhou sheng putong gaoxiao dingxiang yundong xunlian xianzhuang de diaocha yanjiu [Master's thesis, Hebei Normal University].
- Song, Y. (n.d.). Woguo dingxiang yundong jingji shuiping xianzhuang fenxi yu fazhan duice yanjiu [Master's thesis, Northeast Normal University].
- Wu, Z. C. (2010). Hebei sheng putong gaoxiao kaizhan dingxiang yundong de biyaoxing yu kexingxing yanjiu [Master's thesis, Hebei Normal University].
- Xia, D. W., Yuan, X., Wu, D., Yan, J., & Ao, D. R. (2020). Huaxi qu lvyou qihou ziyuan shiyixing fenxi. *Hubei Nongye Kexue*, 59(22), 44–48. <https://doi.org/10.14088/j.cnki.issn0439-8114.2020.22.009>
- Xiao, W. J. (2005). Woguo dingxiang yundong de keyan xianzhuang diaocha ji fazhan duice. *Guangzhou Tiyu Xueyuan Xuebao*, 25(5), 3.
- Zhang, C. S. (n.d.). Woguo putong gaoxiao dingxiang yundong kecheng kaishe xianzhuang ji duice yanjiu [Master's thesis, Qufu Normal University].
- Zhang, H. B. (2017). Tansuo zhongguo dingxiang yundong fazhan xianzhuang ji qianjing tuiguang. *Qingshaonian Tiyu*, (12), 42–43.
- Zhang, X. A., & Liu, Z. W. (2003). Dingxiang yundong: Yi xiang cujin xuesheng zonghe suzhi fazhan de shishang yundong. *Henan Shifan Daxue Xuebao (Ziran Kexue Ban)*, (3), 86–89. <https://doi.org/10.16366/j.cnki.1000-2367.2003.03.021>
- Zhu, X. F., & Wang, X. (2005). Zhongguo dingxiang yundong de fazhan yu zhanwang. *Zhejiang Tiyu Kexue*, 27(4), 4.