

Evaluation on the coordination of protection and development of Yunnan ethnic traditional sports intangible heritage projects

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Keywords: Ethnic traditional sports; Intangible cultural heritage projects; Comprehensive evaluation; Coordinated protection; Sustainable development

Abstract: The intangible cultural heritage of ethnic traditional sports in different regions has its unique morphological characteristics, which reflects the sports history, culture and evolution process of the region, and is an important way to understand the regional cultural evolution process. By investigating and studying the protection and utilization status quo and the existing problems of ethnic traditional sports intangible cultural heritage project resources in Yunnan Province, this paper collects the natural, social and economic data of the study area, and combines the method of qualitative and quantitative analysis, and adopts the analytic Hierarchy Process (AHP) and the variation coefficient of method, to determine the impact factors' weights. Then, we establish the evaluation index system and evaluation model of ethnic traditional sports intangible cultural heritage project resources, and carry out the coordinated evaluation on the protection and utilization status of ethnic traditional sports intangible cultural heritage projects in various states of Yunnan province. Further, the spatial divisions result of the comprehensive potential of the ethnic traditional sports intangible cultural heritage projects is evaluated according to the comprehensive score value generated by GIS spatial analysis. Countermeasures and suggestions for optimizing the resource development mode of ethnic traditional sports intangible cultural heritage projects in Yunnan province, perfecting the coordinated management mechanism of development and protection, and strengthening the construction of talent team are given, aiming at putting forward reasonable suggestions for how to protect and utilize the resources of ethnic traditional sports intangible cultural heritage projects more effectively and reasonably in Yunnan Province in the future.

1. Introduction

The intangible cultural heritage of ethnic traditional sports in different regions has its unique morphological characteristics, reflecting the culture and evolution process of the region, with strong local characteristics and cultural connotation. Due to the non-renewable nature of intangible cultural heritage of ethnic traditional sports, it is difficult to recover the intangible cultural heritage of ethnic traditional sports once it is damaged and lost. Therefore, it is very important to effectively protect the

intangible cultural heritage of ethnic traditional sports resources. The protection of intangible cultural heritage of ethnic traditional sports resources has also been supported by the state, but they are blindly protected and dare not develop. The precious intangible cultural heritage of national traditional sports will be wasted in vain, and the advantage of resources cannot be transformed into economic and social benefits [1]. The reasonable development and effective protection of intangible cultural heritage project resources of ethnic traditional sports are the basis for the sound development of regional cultural inheritance and protection. Therefore, it is necessary to effectively protect and rationally utilize national traditional sports intangible cultural heritage project resources.

In Yunnan Province (Figure 1), there are many kinds of ethnic traditional sports intangible cultural heritage projects with different forms and high aesthetic value. However, there are still deficiencies in the management of intangible cultural heritage resources of ethnic traditional sports in Yunnan Province. There are incongruous problems in the development, utilization and protection of the resources of some ethnic traditional sports intangible cultural heritage resources, that is, some ethnic traditional sports intangible cultural heritage resources are well developed and utilized but negligently protected [2]. These series of problems have affected the coordination of resources development, protection and development of ethnic traditional sports intangible cultural heritage projects in Yunnan Province. In order to ensure the sustainable development of resources of ethnic traditional sports intangible cultural heritage projects in Yunnan Province, the resource types and spatial distribution of these projects are studied on the basis of resource investigation and regional basic data collection. The quantitative evaluation index system of resources was constructed by using analytic hierarchy process (AHP) to evaluate the results of development and utilization of the intangible cultural heritage of ethnic minorities in Yunnan Province. On this basis, suggestions were put forward to optimize the development mode of resources and the construction of coordination management mechanism.

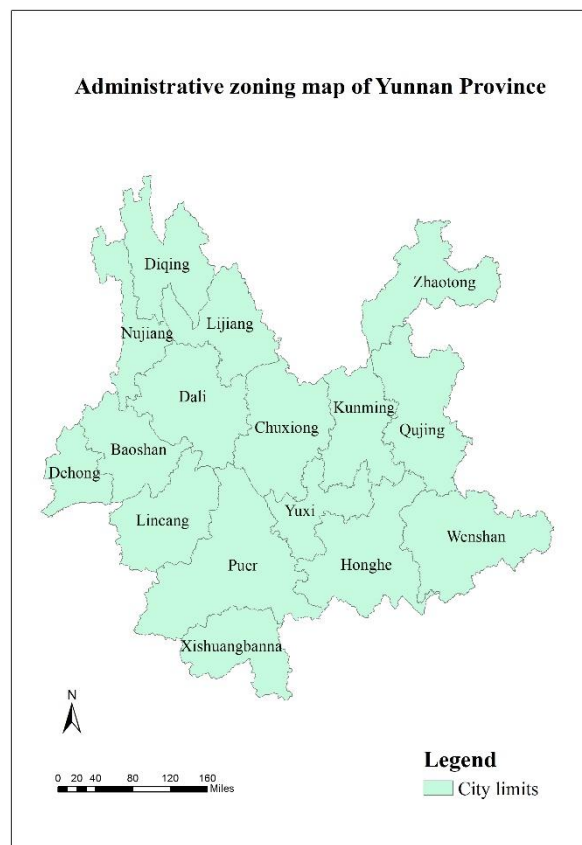


Figure 1: Administrative zoning map of Yunnan Province

2. General situation of the research area

Located in southwest China, Yunnan Province is one of China's five ethnic minority autonomous regions. Yunnan Province is one of the provinces with the largest concentration of ethnic minorities in China. There are 25 ethnic minorities in Yunnan Province, among which the Yi, Hani, Bai and Dai are the most populous. Intangible cultural heritage sports of Yunnan include dance, music, drama, sports competition and other types, among which fire jumping, waist drum, Yunnan opera, folk wrestling and so on are the most representative events. These projects not only reflect the rich and colorful local cultural connotations, but also praise the natural environment, ancestors and life. The Yunnan provincial government attaches great importance to the protection and inheritance of intangible cultural heritage projects in sports. The Yunnan Provincial Department of Culture and Tourism has established the intangible Cultural Heritage List of Yunnan Province, systematically sorted out and summarized the intangible cultural heritage projects in Yunnan province, strengthened the training and guidance for the inheritors of intangible cultural heritage projects, and encouraged young people to learn and inherit intangible cultural heritage projects. In addition, Yunnan Province has also strengthened the protection measures for intangible cultural heritage projects, including the repair and protection of traditional architecture, the repair and protection of traditional handicrafts, the protection of traditional music and dance, etc. In daily work, the inheritance and development [3] of intangible cultural heritage projects are actively promoted through publicity, education, competitions and performances.

3. Resource distribution and evaluation of ethnic traditional sports intangible cultural heritage projects in Yunnan Province

3.1 Resource types and distribution of intangible cultural heritage projects of ethnic traditional sports

As of December 2022, Yunnan Province has 2 traditional sports items in the list of national intangible cultural heritage representative items, 14 traditional sports items in the list of provincial intangible cultural heritage representative items, and 25 representative inheritors of national and provincial intangible cultural heritage representative items. The projects are distributed in 11 cities and cities including Kunming, Yuxi and Zhaotong.

3.2 National traditional sports intangible cultural heritage project resource evaluation

There is confusion about the degree between the protection and utilization of intangible cultural heritage resources of ethnic traditional sports, both in theory and in practice. Although the intangible cultural heritage resources of ethnic traditional sports only account for a small part of the local tertiary industry, they are very important, especially in environmentally fragile areas and culturally sensitive areas, and there is still a certain degree of unsustainability in the development process of the intangible cultural heritage resources of ethnic traditional sports. Therefore, it is very necessary to conduct a quantitative and comprehensive evaluation of the intangible cultural heritage resources of ethnic traditional sports.

3.2.1 Source and processing of data

In the study, we downloaded Google remote sensing images, used vectorization methods, and compared existing graphic data. The resource distribution points of traditional ethnic sports intangible cultural heritage projects, historical and cultural resources, spatial distribution data of ecological resources, road traffic network, tourism development scale data, social and economic data, restricted

texts of cultural protection, and basic data of the research area (roads, water systems, settlements, economic aggregate, etc.) were respectively extracted. On the basis of obtaining the above data, the coordinate unification and tailoring of the data are carried out to ensure the consistency of the data.

Since the data involved in the index cannot be directly compared and contrasted in the unit or representative sense, the usual practice is to carry out the normalization of the data processing, which can eliminate the difference between the data dimensions. In the study of this paper, first of all, the acquired data is processed by indexation. The specific calculation formula is as follows:

$$Z_i = \frac{X_i - X_{\min}}{X_{\max} - X_{\min}} \quad (1)$$

3.2.2 Construction of evaluation index system

On the basis of fully considering the characteristics of the study area and related literature, and analyzing from the perspective of technical process and regional spatial function, the classification system of evaluation index of resources of ethnic traditional sports intangible cultural heritage projects in the study area is formulated. The evaluation index system of resources of sports intangible cultural heritage projects in the study area can be divided into two categories according to the categories: The first is the influence factor reflecting the natural potential of the resources of ethnic traditional sports intangible cultural heritage projects in the research area; The other is the binding conditions for resources of ethnic traditional sports intangible cultural heritage projects, which mainly include cultural protection constraints, social environment constraints and ecological space constraints. These factors mainly consider the reality of the study area and reflect the regional social, economic level and public consciousness's restriction ability on resources development of ethnic traditional sports intangible cultural heritage projects. In order to maintain the status quo of the study area as far as possible in the later spatial zoning evaluation and tourism development project design and layout, this study reduces project development costs, and maintain the coordination of regional cultural [4] landscape.

According to the content of the total amount, structure and quality of ethnic traditional sports intangible cultural heritage projects in 11 cities of Yunnan Province, the research selects several evaluation indexes. Based on the above-mentioned national geographic survey data and the planning text data of the study area, this paper modified and supplemented by referring to literature, taking into account the principles of practicability and accessibility, scientific city and operability, independence and relevance, system city and hierarchy, dynamics and relative stability of the index selection, and finally constructed an evaluation index system for the resources of the sports intangible cultural heritage projects in the study area. See Table 1.

Table 1: Resource evaluation index system of ethnic traditional sports intangible cultural heritage projects in the study area

Influencing factors	Number	Binding
Number of items	A1	Positive boost
Human landscape	A2	Positive boost
Ecological resources	A3	Planning Guidance
Population density	B1	Positive boost
Road density	B2	Positive boost
Economic aggregate	B3	Positive boost
Industrial structure	C1	Negative constraint
Cultural protection	C2	Planning guidance

In the process of data analysis, the regional statistical tool in ArcGIS is used. The influencing

factors of ethnic traditional sports intangible cultural heritage projects are mainly in accordance with the contents and terms stipulated in the Measures for the Protection and Management of Representative Projects of Intangible Cultural Heritage at the Provincial Level in Yunnan Province (Trial). Due to the difficulty in obtaining more primary data, therefore, the zonal statistics of number of ethnic traditional sports intangible cultural heritage projects are calculated by ArcGIS software based on a city-scale. The cultural landscape mainly takes into account the cultural relics, cultural attractions, customs and so on in the region, and evaluates through the subjective scoring method (1-10 points); Ecological resources are mainly calculated through the proportion of the non-building land area and the total area of the city, and the zoning statistics are carried out according to the scope of the city; The population density is calculated according to the proportion of the total population of the city and the area under the jurisdiction; Roads are statistically analyzed according to the length of roads in each city; The economic aggregate is obtained according to the statistical yearbook of each city; Topographic slope in accordance with the DEM data of the district slope analysis, statistical distribution of each slope data obtained; Cultural protection is evaluated through the subjective score (1-10 points) of the content and level of the guidance documents of cultural protection construction in the jurisdiction by the planning departments of each city and city, and finally the data obtained by each city and city are statistically analyzed and standardized (Table 2).

Table 2: Standardized results of resource evaluation indicators of ethnic traditional sports intangible cultural heritage projects in the study area

Indicators	A1	A2	A3	B1	B2	B3	C1	C2
Yuxi City	0.3508	1.0000	0.5894	0.2784	0.3290	0.2087	1.0000	1.0000
Zhaotong City	0.3034	0.2043	0.4270	0.1803	0.2407	0.3794	0.1828	0.2100
Red River State	0.5081	0.3006	0.6569	0.4231	0.2506	1.0000	0.3113	0.4519
Dali	0.3581	0.1583	0.4040	0.2391	0.2036	0.3169	0.1672	0.2048
Xishuangbanna	0.3181	0.2583	1.0000	0.3766	0.2179	0.5281	0.3249	0.4042
Kunming	0.5183	0.2583	0.5217	0.3531	0.3243	0.4285	0.2665	0.3078
Puer City	0.0428	0.0000	0.1568	0.1671	0.0000	0.1284	0.0000	0.0605
Chuxiong Prefecture	0.2758	0.5743	0.6985	1.0000	1.0000	0.5504	0.6877	0.4196
Lincang	0.0241	0.3766	0.0217	0.2733	0.4028	0.3973	0.5291	0.5204
Baoshan City	1.0000	0.7058	0.0000	0.2479	0.1719	0.3536	0.3848	0.2879
Wenshan Prefecture	0.0000	0.1846	0.3886	0.0000	0.1648	0.0000	0.2267	0.0000

3.2.3 Analytic Hierarchy Process weight acquisition

The evaluation factors of protection and utilization of national traditional sports intangible cultural heritage project resources are established separately by AHP, and then the coordination of protection and development is comprehensively analyzed and evaluated by fuzzy synthesis method. This study uses the analytic hierarchy process to determine the subjective weight coefficient of each main control index. In order to measure the weights of indicators in different dimensions and reduce the randomness of measurability between indicators, the coefficient of variation method was used to calculate the weights of each variable. This part directly calculates the Average and standard deviation of different indicators in Excel software, coefficient of variation = standard deviation/average, and then according to weight = coefficient of variation /SUM (X1:X10), you can get the weight of each variable b. By synthesizing the subjective and objective weight coefficients of each main control index calculated by the above analytic hierarchy process and coefficient of variation method, a comprehensive weighting model based on the combination of AHP-coefficient of variation method

is established. The calculation formula of comprehensive weighting is as follows:

$$w_i = \mu \times a_i + (1 - \mu) \times b_i \quad (2)$$

In order to ensure the objectivity and accuracy of the two index weighting methods, the value results (Table 3) were comprehensively evaluated in this paper. According to the spatial differences and numerical changes of the results, the value was finally defined as 0.5 in this paper, that is, the weight of the objective evaluation method AHP method and the coefficient of variation method was the same.

Table 3: Weight value of resource evaluation index of ethnic traditional sports intangible cultural heritage project in the study area

	A1	A2	A3	B1	B2	B3	C1	C2
Standard deviation	0.2865	0.1839	0.1799	0.1504	0.1582	0.1916	0.1534	0.1387
Mean	0.4368	0.2898	0.4852	0.3171	0.2513	0.4073	0.3019	0.3011
Coefficient of variation	0.6560	0.6346	0.3708	0.4741	0.6296	0.4703	0.5082	0.4607
AHP coefficient	0.1141	0.0709	0.0405	0.0433	0.0605	0.0547	0.0473	0.0388
Composite weights	0.1003	0.0733	0.0423	0.0490	0.0669	0.0557	0.0531	0.0457

3.2.4 Model construction and calculation

This paper constructs a resource potential evaluation model for ethnic traditional sports intangible cultural heritage projects, and calculates the realistic potential score of comprehensive renovation in line with the actual situation of spatial development and protection in the study area. The mathematical model of cost grid comprehensive evaluation is as follows:

$$CR = P_1X_1 + P_2X_2 + \dots + P_nX_n \quad (n = 1, 2, \dots, n) \quad (3)$$

Where, represents each evaluation index, represents the weight of each evaluation index ($X_1 + X_2 + \dots + X_n = 1$). On the basis of obtaining the weights of the evaluation and selection indicators of ethnic traditional sports intangible cultural heritage items in the study area by using the comprehensive empowerment analysis method, the above indicators affecting the development and protection of ethnic traditional sports intangible cultural heritage items were super placed with Excel analysis tool to obtain the comprehensive evaluation result of the development potential of the study area.

3.2.5 Analysis of comprehensive evaluation results of development potential in the study area

Table 4: Descriptive statistical analysis results of resource exploitation potential of ethnic traditional sports intangible cultural heritage projects in the study area

	Standard Deviation	Mean value	Variance	Max	Min	Median	95.0% confidence
Value	0.0542	0.1679	0.0062	0.4027	0.0000	0.3201	0.0135

According to the descriptive statistical analysis of the measurement results of resource development potential of ethnic traditional sports intangible cultural heritage projects in 11 cities and cities in the study area, the maximum value is 0.4027, the minimum value is 0, and the median value

is 0.3201. The specific results are shown in Table 4.

In this study, Excel software was used to generate a line chart from small to large for the comprehensive evaluation value of national traditional sports intangible cultural heritage resources in the study area, and the transition points of curve and convex changes and the points of sudden change rate in the line chart were used as the threshold points for classification for partition analysis. As can be seen from Figure 2, this paper divides the resource development potential of ethnic traditional sports intangible cultural heritage projects in the study area into four levels, with the approximate spatial locations of threshold points for the classification being Xishuangbanna (0.4441), Kunming (0.5340) and Yuxi (0.7137).

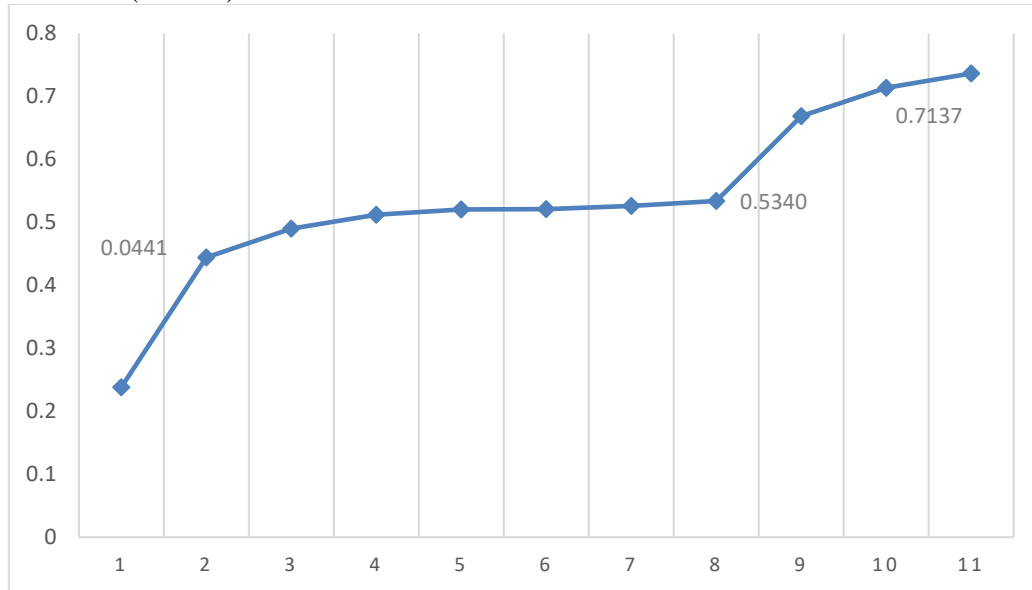


Figure 2: Threshold of comprehensive evaluation of intangible cultural heritage resources of ethnic traditional sports projects in 11 cities of Yunnan Province

According to the threshold diagram of comprehensive evaluation of intangible cultural heritage resources of ethnic traditional sports projects in the study area, the development of intangible cultural heritage resources of ethnic traditional sports projects in the study area presents spatial imbalance in the cities and cities. The development potential of level 1 and level 2 intangible cultural heritage resources in the study area is mainly distributed in Chuxiong Prefecture, Xishuangbanna and Puer City. The tertiary industry has developed to a certain extent, such as Xishuangbanna's tourism industry, Puer's tea and other resources have provided financial support for the city, attracted the flow of people and promoted the development of its cultural industry. Level 3 and level 4 regions are mainly distributed in Kunming, Yuxi and Zhaotong. Kunming, as the capital of Yunnan Province, has natural advantages in terms of policies and resources. Coupled with suitable living conditions, the cultural development of Kunming has always been in the forefront, but Kunming is different from Yuxi and Zhaotong in that these regions are characterized by the concentration of ethnic minorities, the industry is mainly agricultural, both the economic and industrial base are relatively weak, and the degree of urbanization is also low, which has promoted the preservation and development of traditional national culture to a certain extent. For example, according to the public information of Yuxi City, which is well developed, the sustainable development level of the intangible cultural heritage of ethnic traditional sports projects in this region is at a steady growth stage. Secondly, from the perspective of social concern about intangible cultural heritage resources of ethnic traditional sports, Yuxi municipal government has provided great support for the resources of intangible cultural heritage projects of ethnic traditional sports.

4. Strategies and Suggestions for sustainable development of ethnic traditional sports intangible cultural heritage projects in Yunnan Province

4.1 Optimize the resource development mode of ethnic traditional sports intangible cultural heritage projects

With the development of economy, tourism has become one of the pillar industries in each city of Yunnan Province. With the development of tourism, many tourists begin to pay attention to intangible cultural heritage project resources with high cultural attributes, but the mature development mode of intangible cultural heritage project resources of ethnic traditional sports has not yet formed in China. Most projects plan and design products according to the public demand, under the banner of "intangible cultural heritage project resources of Ethnic traditional sports", but they do not know what the real intangible cultural heritage project resources of ethnic traditional sports are. Even less do they know how to design and manage the intangible cultural heritage resources [5] of national traditional sports.

Yunnan Province is rich in intangible heritage project resources of ethnic traditional sports. In order to better develop and protect ecological resources, it is urgent to formulate a sound development plan for intangible heritage project resources of ethnic traditional sports and construct a sound certification system for intangible heritage project resources of ethnic traditional sports. Through the development plan of national traditional sports intangible cultural heritage project resources, it is necessary to find a suitable path for project development, prevent over-exploitation, and protect cultural diversity and project diversity. The development model can be in the following ways:

1) Tourism development. Traditional national sports will be developed as tourism resources to attract tourists to experience and watch. For example, in the water-splashing Festival in Yunnan Province, tourists can participate in the traditional water-splashing game and feel the rich ethnic cultural atmosphere.

2) Education and promotion. Traditional ethnic sports will be included in the physical education curriculum of schools, so that more young people can understand and learn traditional culture. For example, in the flower waist jumping activity in Yunnan province, students can learn more information about ethnic culture by learning such knowledge as the skills and origin of the dance.

3) Cultural exchange. Through holding ethnic traditional sports competitions and cultural exchange activities, cultural exchanges with other regions and countries should be strengthened to promote the inheritance and development of ethnic culture. For example, in the Dianchi Dragon Boat Race in Yunnan Province, not only local players but also players from other regions and countries participate, enhancing cultural exchanges and interaction.

4.2 Improve the coordination and management mechanism of development and conservation

From the aspects of development, construction, operation, management, environmental and social benefits of intangible cultural heritage project resources of ethnic traditional sports, the current main project has convenient transportation, reasonable layout of tourist routes, complete basic facilities, and environmental education facilities. However, managers make plans mainly from the perspective of profit, and pay insufficient attention to the cultural transmission of tourists and the protection of tourism resources. Therefore, in the management process, it is necessary to improve the coordinated management mechanism [6] of development and protection. In order to improve the coordinated management mechanism for the development and protection of intangible cultural heritage projects, efforts can be made from the following aspects:

1) Policy support strengthening. The government can formulate relevant laws, regulations and policy documents to clarify the requirements for the protection and development of intangible cultural

heritage projects and provide policy support for the development and protection of intangible cultural heritage projects. At the same time, the government can also provide economic support for the development and protection of intangible cultural heritage projects through financial support and other means.

2) Coordination mechanism. In the process of the development and protection of intangible cultural heritage projects, there are multiple departments and agencies involved, so it is necessary to establish a coordination mechanism, clarify the responsibilities and tasks of relevant departments and agencies, and strengthen collaboration and communication. For example, in Yunnan province, the Yunnan Intangible Cultural Heritage Protection Center has been set up to take charge of the protection, inheritance, development and management of intangible cultural heritage projects.

3) Publicity and education: Strengthening the publicity and education of intangible cultural heritage projects can be carried out in various ways, such as holding exhibitions, carrying out cultural activities, and producing publicity materials. At the same time, education and training can also be used to raise the awareness and protection awareness of relevant personnel on intangible cultural heritage projects.

4) Supervision mechanism. Establish a supervision mechanism for the development and protection of intangible cultural heritage projects, which can be carried out through inspection and assessment. For example, in Yunnan Province, an intangible cultural heritage protection supervision body has been set up to supervise and inspect the development and protection of intangible cultural heritage projects to ensure effective protection and development of intangible cultural heritage projects.

4.3 Strengthen the construction of intangible cultural heritage project practitioners

To a large extent, the quality of personnel engaged in the development and protection of intangible cultural heritage projects has become a decisive factor restricting the in-depth development of national traditional intangible cultural heritage project resources and products. In the actual development and operation management, the construction of professional quality of the personnel team should be raised to a new level of understanding, and the construction of the professional talent team of intangible cultural heritage projects should be strengthened. The intangible cultural heritage project resources of Yunnan ethnic traditional sports will be further developed [7]. Some countermeasures are suggested below:

1) Inheritance mechanism shall be established. A inheritance mechanism for intangible cultural heritage projects, including clarifying the inheritance objectives, contents, methods and procedures, etc., shall be established to provide guidance and guarantee for the inheritance of intangible cultural heritage projects. For example, the government of Yunnan province has set up an intangible cultural Heritage inheritance center to handle the inheritance and management of intangible cultural heritage projects.

2) The inheritance of masters and apprentices shall be emphasized and strengthened. Master and Apprentice inheritance is an important way of inheriting intangible cultural heritage projects. The strengthening of the inheritance of master and apprentice, is conducive to cultivate the younger generation of inheritors through the hands-on teaching of skills and knowledge of intangible cultural heritage projects by masters, and it also can ensure the effective inheritance of intangible cultural heritage projects. For example, in the production of ethnic handicrafts in Yunnan province, the older generation of craftsmen pass on their skills and knowledge to the younger generation to ensure the inheritance of handicrafts [8].

3) Archival materials database shall be established. The database of archival materials of intangible cultural heritage projects, including the history, origin, skills, schools and other information of intangible cultural heritage projects, is urgently needed to provide reliable data support for the

management of intangible cultural heritage projects. For example, an intangible cultural heritage archive has been set up by the government of Yunnan province, to collect and sort out relevant materials of intangible cultural heritage projects.

4) The application of new technologies shall be further promoted. The new technologies, such as digital technology, virtual reality technology, etc., are in urgent need of attention, and the level of technology shall continue to improve for providing new means and ways of the inheritance of intangible cultural heritage projects. For example, in the Cultural Heritage Digital Protection and Utilization Center in Yunnan Province, intangible cultural heritage items are protected and passed on through digital technology.

5. Conclusions

The development and protection of ethnic traditional sports intangible cultural heritage projects in Yunnan Province is an urgent problem to be solved. This paper takes Yunnan Province as the evaluation object, and establishes the evaluation index system and evaluation model of the sustainable development of ethnic traditional sports intangible cultural heritage projects according to the evaluation model of the sustainable development of ethnic traditional sports intangible cultural heritage projects by using analytic hierarchy process and coefficient of variation method, combined with the relevant data of the study area. The index system and evaluation model can be used to evaluate the sustainable development level of ethnic traditional sports intangible cultural heritage projects in the region. According to the evaluation results, some countermeasures are proposed to improve the sustainable development of ethnic traditional sports intangible cultural heritage projects in Yunnan province. The research conclusion has far-reaching significance for the coordinated development of resource protection and development of ethnic traditional sports intangible cultural heritage projects. The development and protection of ethnic traditional sports intangible cultural heritage projects in Yunnan Province need to consider a variety of driving mechanisms, and select a suitable development model according to the local industry and ecological environment. At the same time, it is suggested that the government formulate more preferential tax policies, take the Belt and Road as an opportunity, create more special functional sectors in the form of border town trade zones, border economic cooperation zones, key development and opening pilot zones and give preferential policies, actively cultivate the market environment of Yunnan Province, and promote the interaction of transportation, market, administration and other dynamics, and jointly promote the protection and development of ethnic traditional sports intangible cultural heritage projects in Yunnan Province.

Acknowledgements

Scientific Research Fund of Education Department of Yunnan Province: Study on the Spatio-Temporal Evolution and Sustainable Development of Traditional Minority Sports in Yunnan from the Perspective of Historical Geography (2022J1460).

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