Supply Side Reform of Tourism in Ethnic Areas Empowers Common Wealth--Based on the Perspective of Tourism Human Resources

Xueqin Hu

1. College of Tourism and E-commerce, Baise University, Baise, Guangxi, 533000, China.

Abstract

As part of the supply-side reform, tourism in ethnic areas is increasingly recognized as crucial for achieving shared prosperity. This paper introduces a model from the perspective of tourism human resources designed to predict the demand for such resources. The model aims to inform strategies that support supply-side reforms in tourism for ethnic areas. The GM(1,1) model is constructed with the gray algorithm model, and on the basis of the gray algorithm model, the gray prediction method is effectively combined with the BP neural network prediction method, and the prediction preferences are made according to the variance as well as the prediction method idea of the preferred combination, and the final prediction results are obtained. In the analysis of the tourism human resources profile and demand forecast in Xinjiang, the total number of tourism employment in 2022 accounts for 17.22% of the total number of jobs, and the total number of tourism students in school reaches 6,189. Only 11.66% of tourism human resources are highly educated talents with a bachelor's degree or above, and the number of personnel with senior titles is only 8.42%, which is obviously low in high-education and high-level talents. Nearly 80% of the personnel in non-tourism-related categories are still there, and the specialization of tourism management personnel is low. The demand for tourism human resources in Xinjiang in 2027 is expected to reach 2.1179 million.

Keywords: Tourism human resources; Demand forecast; Grayscale algorithm; BP neural network.

AMS 2010 codes: 68T05
1 Introduction

Ethnic areas are essential resources for the development of tourism in China. Unique historical development process, distinctive culture, different natural features and exceptional geographic environment are the advantageous conditions for the development of ethnic tourism in China, which is also an essential prerequisite for the formation of ethnic cultures with rich connotations [1-3]. Therefore, ethnic culture has become an advantageous resource for the development of ethnic tourism in China [4-5]. At the present stage, modern people's demand for tourism is becoming more and more vigorous, and ethnic regions are gradually becoming the destinations of modern travelers. However, under the policy guidance of supply-side reform, how modern ethnic regions can form new ideas and new paths of tourism development with the power of this national policy will become a kind of guiding force for the future tourism development of ethnic regions [6-7]. If this guiding force is played well, it will undoubtedly have a positive impact on the economic and social development, spiritual civilization construction, and cultural industry revitalization of ethnic regions [8].

On the other hand, as a service-oriented industry, tourist attractions often face problems such as a shortage of human resources and high management costs in the process of development, which directly affects the service quality and economic benefits of tourist attractions [9]. For these problems, tourist attractions need to find an effective cost management strategy to improve the utilization efficiency of human resources in tourist attractions [10-11].

With the accelerated development of modern tourism, tourists are increasingly in need of high-level, diversified, and connotative tourism products. Tourism products are no longer only produced around the market demand, and reform from the supply level has become a new path for the development of modern tourism. As an essential resource-rich area for China's tourism development, ethnic regions are facing the problem of how to cope with modern tourists' demand for high-level, diversified, and connotative tourism. In the face of the national policy guidance in the macro-development policy, ethnic areas should combine their reality to promote the faster and better development of tourism in ethnic regions [12]. Literature [13] examined the community's views and attitudes towards tourism in protected areas, and according to the characteristics of the three groups, relevant policy guidance and intervention was carried out to promote the harmonious and sustainable development of ethnic protected areas. Literature [14], based on a case study of tourism development in British Columbia, suggests that a sense of national identity and cultural self-confidence can help to increase citizens' interest in tourism to ethnic cultural heritage sites. Literature [15] reveals the impacts of the New Crown Epidemic on the tourism industry. It develops a proposal for green scenic resilience development to promote the recovery of the tourism industry and biodiversity conservation in ecological scenic areas. Literature [16] reviewed studies related to the sustainable development of the tourism industry with regard to development models, tourism industry knowledge, and stakeholder gaming and explored the future trends of tourism industry development. Literature [17] describes how the protection of ecological natural resources in natural tourist attractions in Slovakia indirectly protects the geological heritage and, at the same time, helps to effectively publicize the geological heritage and promotes the sustainable development of geological heritage tourism resources.

With the continuous development of global tourism, many tourist attractions across the country have seen their boom period. However, as tourist attractions continue to grow, human resource management becomes an increasing challenge. Literature [18] utilized a questionnaire survey method to identify the attitudes of tourists in the Kruger National Park towards the potential direction of tourism development, with tourists wanting a more innovative tourism experience. Literature [19] explored the safety and accommodation of coastal tourism and visitor perceptions of these two management indicators, and the findings inform policy development for coastal tourism management. Literature [20] discussed the formulation and selection of rural tourism development strategies and
paths. It concluded that rural tourism development brings more benefits than disadvantages and has a positive impact on rural revitalization. Literature [21] learned through research that tourists’ motivation for ethnic minority cultural heritage scenic spots is mainly cultural characteristics, of course, including scenic services, entertainment, and cultural aesthetics. Literature [22] in-depth analysis of the current cultural heritage management problems of ethnic minority cultural ecotourism scenic spots, which promotes the understanding of ethnic and cultural heritage sites, helps in the development of the ethnic minority tourism industry, and management optimization in the future.

This paper proposes a tourism human resource prediction model to provide a reference basis for tourism supply-side reform countermeasures in ethnic areas with the goal of achieving common wealth. In the gray algorithm model, the corresponding differential equations and time response equations of the GM(1,1) model are constructed to complete the solution of the human resource demand model, and the combined model is built by combining the BP neural network. In the process of creating the combined model of tourism human resources prediction, the generation of a new accumulation method is carried out to establish the sequence of accumulation. At the same time, the differential equation of gray is solved to obtain the whitening equation, which is then used to improve the predicted value of the gray prediction model. In the event that the predicted values do not meet the accuracy requirements, the standard BP neural network prediction model is utilized to improve and correct the residuals of the predicted values above. Finally, the constructed model is applied to the analysis of tourism in Xinjiang, and relevant strategies for tourism development in ethnic areas are proposed.

2 Tourism human resources demand forecasting model

2.1 Gray algorithm model

The basic principles of gray system theory include the principle of difference information, that is, “difference” is information, and all information must be different. The principle of non-uniqueness of the solution, i.e., The solution to incomplete and uncertain information, is not unique. The principle of minimum information that is, the “amount” of information that can be obtained, is the watershed of judging “gray” and “non-gray”, and fully develop and utilize the “minimum information” that has been possessed. Minimum information” is the basic idea of gray system theory to solve problems. The principle of cognitive basis states that information is the basis of cognition. With complete and specific information as the basis, one can obtain complete and specific cognition. Based on incomplete and uncertain information, only incomplete and uncertain gray-scale cognition can be obtained. The principle of indestructibility of grayness, i.e., “information is incomplete,” and “gray” is absolute.

The basic principle of gray system theory focuses on the general law of the development of people and things. Therefore, studying the development law and trend of tourism human resources with gray system theory provides an essential theoretical basis for practical tourism human resources management and development.

Let \( Y^{(0)} \) be the original sequence, \( Y^{(0)} = \left( y^{(0)}(1), y^{(0)}(2), \ldots, y^{(0)}(n) \right) \), such that \( \sigma^{(0)}(k) \) is the rank ratio of \( Y^{(0)} \), \( \sigma^{(0)}(k) = \frac{Y^{(0)}(k-1)}{Y^{(0)}(k)} \), where \( k \geq 3 \), then when \( \sigma^{(0)}(k) \in (0.1353, 7.389) \), \( Y^{(0)} \) can be modeled as a non-deformed GM(1,1).
Let \( Y^{(0)} \) be a nonnegative sequence, \( Y^{(0)} = \left( y^{(0)}(1), y^{(0)}(2), \ldots, y^{(0)}(n) \right) \), where \( y^{(0)}(k) \), \( k = 1, 2, \ldots, n \). \( Y^{(1)} \) be the cumulative generating sequence (1-AGO) of \( Y^{(0)} \), \( Y^{(1)} = \left( y^{(1)}(1), y^{(1)}(2), \ldots, y^{(1)}(n) \right) \), where \( y^{(1)}(k) = \sum_{i=1}^{k} y^{(0)}(i), k = 1, 2, \ldots, n \). \( Z^{(1)} \) be the immediate-neighbor mean generating sequence of \( Y^{(1)} \), where

\[
Z^{(1)} = \left( \frac{(e-2)y^{(1)}(k+1)+y^{(1)}(k)}{e-1}, k = 1, 2, \ldots, n \right).
\]

If \( \alpha = [\alpha, \mu]^T \) is a parameter column and

\[
Y = \begin{bmatrix}
y^{(0)}(2) \\
y^{(0)}(3) \\
\vdots \\
y^{(0)}(n)
\end{bmatrix}, \quad B = \begin{bmatrix}
-z^{(1)}(2) & 1 \\
-z^{(1)}(3) & 1 \\
\vdots & \vdots \\
-z^{(1)}(n) & 1
\end{bmatrix},
\]

then the least squares estimation series of the GM(1,1) model

\[
y^{(0)}(k) + \alpha z^{(1)}(k) = u
\]

is satisfied \( \hat{\alpha} = B^T B \)\( Y \). The applicability of the model is related to the development coefficient \( \alpha \), and the GM(1,1) model makes sense only if \( |\alpha| < 2 \) otherwise the GM(1,1) model loses its significance.

Construct the corresponding differential equations for the GM(1,1) model:

\[
\frac{dy^{(1)}(t)}{dt} + \alpha y^{(1)}(t) = \mu
\]

(1)

Where \( y^{(1)}(t) \) is the primary cumulative value of the system state variable \( y^{(0)}(t) \), \( y(t) \) is the human resource requirement in year \( t \), and \( \alpha \) and \( \mu \) are parameters to be determined. Construct \( B \) matrix and \( Y \) matrix:

\[
B = \begin{bmatrix}
-\frac{1}{2} \left[ y^{(1)}(1) + y^{(1)}(2) \right] & 1 \\
-\frac{1}{2} \left[ y^{(1)}(2) + y^{(1)}(3) \right] & 1 \\
\vdots & \vdots \\
-\frac{1}{2} \left[ y^{(1)}(n-1) + y^{(1)}(n) \right] & 1
\end{bmatrix}, \quad Y = \begin{bmatrix}
y^{(0)}(2) \\
y^{(0)}(3) \\
\vdots \\
y^{(0)}(n)
\end{bmatrix}
\]

(2)

Then \( \alpha, \mu \) can be found as follows:

\[
[\alpha, \mu]^T = \left( B^T B \right)^{-1} B^T Y
\]

(3)

The time response equation is:

\[
\hat{y}(k+1) = \left[ y^{(1)}(0) - \frac{\hat{\mu}}{\hat{\alpha}} \right] e^{-\hat{\alpha}k} + \frac{\hat{\mu}}{\hat{\alpha}}
\]

(4)
When \( k = 1, 2, 3, \ldots, n - 1 \), the above equation calculates the fitted value. When \( k \ldots n \), \( y(k+1) \) is the predicted value. The solution process is as follows.

1) Establish a one-time cumulative generating series. Set the original series:

\[
y^{(0)}(k) = \{y^{(0)}(1), y^{(0)}(2), \ldots, y^{(0)}(k)\}, k = 1, 2, \ldots, n
\]  

(5)

Generate columns:

\[
y^{(1)}(k) = \{y^{(1)}(1), y^{(1)}(2), \ldots, y^{(1)}(k)\}, k = 1, 2, \ldots, n
\]  

(6)

Moreover, the following relationship is satisfied between equations (5) and (6):

\[
y^{(1)}(k) = \sum_{k=1}^{n} y^{(0)}(k)
\]  

(7)

Make one accumulation as above to get the generating series (\( \mathbb{n} \) is the sample space).

2) Use the least squares method to find the parameters \( \alpha \) and \( \mu \), and use equation (1) and equation (6) to find the vector \( \hat{a}, \hat{\mu} \), and then use equation (4) to get the corresponding parameter response vector \( \hat{y}(k+1) \).

This completes the human resources demand model solution for tour guides. Of course, according to the needs of the actual situation, the accuracy of the model can be verified. By using the gray residual model, the original model can be modified to obtain a more realistic prediction equation.

2.2 Combined model for forecasting demand for tourism human resources

The demand forecasting model based on the gray BP neural network is an effective combination of the gray forecasting method and BP neural network forecasting method to model and solve those complex nonlinear problems. That is, the whole model is called GNNM \( (n, h) \), where \( n \) is the order of the differential equations, and \( h \) is the number of sequences involved in the modeling.

The basic idea for modeling this combined demand forecast is as follows. The first step in gray modeling is to use the sample values and their fitted values as inputs to the BP neural network. Secondly, the training of the network is to be carried out using the actual values of the samples as the primary desired output so that the possible errors of the computer network can be made precise. If the errors do not get the set precision, then the training should be stopped. This is then used as a basis for the implementation of network prediction. Under the guidance of the whole idea, we can establish a basic model for the gray BP neural network demand forecasting model below.

In this combined prediction model, we can set \( f_1 \) as the gray prediction value, \( f_2 \) as the \( BP \) neural network prediction value, and \( f_c \) as the prediction of the preferred combination of values, and we also classify the error into \( e_1, e_2, \) and \( e_c \) when we carry out the analysis. The corresponding weight coefficients are selected as \( w_1 \) and \( w_2 \), and \( w_1 \) and \( w_2 \) of the sum of 1, then we can get the following a formula:
\[ f_c = w_1 f_1 + w_2 f_2 \]  

(8)

Calculating the error and variance of this formula yields the following equation:

\[ e_c = w_1 e_1 + w_2 e_2 \]  

(9)

\[
\text{var}(e_c) = E\left(e_c^2\right) - \left[E\left(e_c\right)\right]^2 = E\left(e_c^2\right) = \text{var}(w_1 e_1 + w_2 e_2) = w_1^2 \text{var}(e_1) + w_2^2 \text{var}(e_2) + 2w_1w_2 \text{cov}(e_1, e_2)
\]

(10)

Then a minima of \( \text{var}(e_c) \) for the above equation is obtained:

\[
w_i = \frac{\text{var}(e_2) - \text{cov}(e_1, e_2)}{\text{var}(e_1) + \text{var}(e_2) - 2 \text{cov}(e_1, e_2)} \quad \text{and where} \quad w_2 = 1 - w_i
\]

(11)

In the above model, we know that the gray prediction model is based on the gray system theory. In contrast, the BP neural network prediction model is modeled through the simulation of artificial neural networks. Although the modeling ideas and methods of these two forecasting models are not the same, we will combine them in the establishment of a human resources demand forecasting model so that they can be compared with each other in order to find the weight coefficients of the combination of demand forecasting:

\[
w_i = \frac{\delta_{22}}{\left(\delta_{11} + \delta_{22}\right)}
\]

(12)

\[
w_2 = \frac{\delta_{11}}{\left(\delta_{11} + \delta_{22}\right)}
\]

(13)

In the two-coefficient model, if there is new data to join, or if the expectation of the basis of the prediction accuracy can be further improved, then the calculation of the weights should be re-conducted, or the use of variable weights for the combination of the prediction calculation.

The demand prediction model based on the gray BP neural network is a combination of the gray model and BP network neural prediction model, so in the process of its use needs to follow specific prediction steps so that the entire human resources demand prediction can be completed. Below are the particular model prediction steps.

First, according to the gray model and BP neural network model sequence, we generate a new cumulative method and establish the cumulative sequence.

Second, the gray differential equations are solved so that the discrete response function can be mapped to the BP neural network system model, which is used as the basis for training the network to obtain the whitening equation.

The gray prediction model's predicted values are improved by calculating the equations based on the whitening equations obtained in the previous step.
Fourth, measure and evaluate the predicted value. If the expected value is compared with the accuracy of the prediction model, and it is found that it can meet the pre-set accuracy, then go directly to the sixth step. If not, then go to the fifth step.

Fifth, the standard BP neural network prediction model is used to improve and correct the residuals of the predicted values above so that they can meet the set prediction accuracy.

The standard BP neural network demand prediction method is utilized to make basic predictions on the sample data and derive the predicted values from the BP neural network.

Seventh, according to the variance and the preferred combination of prediction methods, we can carry out the gray prediction model and BP neural network model prediction preferences and obtain the final prediction results.

3 Overview of human resources and demand forecast for tourism in ethnic areas

This chapter will take Xinjiang Uygur Autonomous Region (XUAR) of China as the main body of the study to gain an in-depth understanding of its present-day tourism human resource development profile and to forecast the future tourism human resource demand in Xinjiang by combining with the tourism human resource forecasting model proposed in this paper.

3.1 Overview of human resources for tourism in Xinjiang

3.1.1 Tourism employment

The number of tourism employment in Xinjiang from 2013 to 2022 is shown in Table 1. The growth of tourism in Xinjiang has caused a steady increase in the number of human resources for tourism in Xinjiang. Tourism has increasingly promoted and driven social employment, accounting for 17.22% of jobs in the entire autonomous region, from 14.98% in 2013 to 17.22% in 2022. From 2013 to 2022, the number of direct employment in tourism grew from 121,000 in 2013 to 393,000 in 2022, an increase of 224.79%. The growth rate of direct employees is much higher than the growth rate of the province's tourism industry, but the share of direct employment in tourism in the total number of tourism employment is still less than 20%. Compared to other provinces, Xinjiang's tourism industry has developed relatively late, which, to some extent indicates that tourism still has more significant potential and potential for development in promoting employment.

Table 1. Tourist employment

<table>
<thead>
<tr>
<th>Year</th>
<th>Travel direct employment (ten thousand)</th>
<th>Total number of tourist jobs (ten thousand)</th>
<th>Total employment in Xinjiang (ten thousand)</th>
<th>Proportion of tourist employment in total employment (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>12.1</td>
<td>103.95</td>
<td>693.85</td>
<td>14.98</td>
</tr>
<tr>
<td>2014</td>
<td>12.8</td>
<td>106.72</td>
<td>685.38</td>
<td>15.57</td>
</tr>
<tr>
<td>2015</td>
<td>13.2</td>
<td>110.62</td>
<td>701.49</td>
<td>15.77</td>
</tr>
<tr>
<td>2016</td>
<td>15</td>
<td>107.92</td>
<td>721.27</td>
<td>14.96</td>
</tr>
<tr>
<td>2017</td>
<td>20.76</td>
<td>112.83</td>
<td>748.35</td>
<td>15.08</td>
</tr>
<tr>
<td>2018</td>
<td>24.16</td>
<td>115.98</td>
<td>752.13</td>
<td>15.29</td>
</tr>
<tr>
<td>2019</td>
<td>27.54</td>
<td>120.53</td>
<td>758.42</td>
<td>15.78</td>
</tr>
<tr>
<td>2020</td>
<td>30.16</td>
<td>128.16</td>
<td>762.15</td>
<td>16.68</td>
</tr>
<tr>
<td>2021</td>
<td>32.1</td>
<td>136.15</td>
<td>764.06</td>
<td>17.16</td>
</tr>
<tr>
<td>2022</td>
<td>39.3</td>
<td>134.84</td>
<td>768.27</td>
<td>17.22</td>
</tr>
</tbody>
</table>
3.1.2 Overview of Tourism Education

With the development of tourism in Xinjiang in recent years, the scale of tourism colleges and universities in Xinjiang has developed to a certain extent, and the number of colleges and universities that offer tourism majors and the number of students enrolled in tourism-related majors have increased year by year. The number of students enrolled in tourism majors in Xinjiang from 2013 to 2022 is shown in Figure 1. It can be seen that the total number of students enrolled in tourism colleges and universities in Xinjiang has been increasing year by year. The total number of students enrolled in tourism majors in 2022 reached 6,189, an increase of 207.86% compared with that in 2013, among which the number of students enrolled in institutions of higher education and the number of students enrolled in secondary vocational schools were 5,619 and 1,223, respectively. Compared with the steady growth of the number of students enrolled in institutions of higher education, the number of students enrolled in secondary vocational schools has fluctuated. Compared with the steady increase in the number of students in higher education institutions, the number of students in secondary vocational schools fluctuates, with a downward trend in 2016, 2018, and 2022. Still, the overall trend remains upward, with the number of students in 2022 increasing by 65.07% compared with that in 2013.

Figure 1. Number of tourist majors

Career choice orientation refers to the factors that influence tourism students' choice of employment. Understanding the career choice orientation of tourism students in Xinjiang can provide direction for the development of tourism human resources and the tourism industry in Xinjiang to a certain extent. An in-depth empirical investigation of the career choice orientation of tourism students in Xinjiang was conducted through random sampling by collecting 200 pieces of data from each of the three student groups: college students majoring in tourism, undergraduate students majoring in tourism, and postgraduate students majoring in tourism and above, for a total of 600 pieces of data. The specific details of the factors influencing the career choice orientation of Xinjiang tourism majors are shown in Table 2. As far as the group of tertiary students specializing in tourism is concerned,
“personal development” is the first factor to be considered when choosing a job, and “economic income and welfare” is another important factor, accounting for 26.66% of the respondents. The industry outlook has become the third factor to be considered when choosing a job, accounting for 26.66% of the respondents. The industry prospect is the third factor in selecting a job, accounting for 25.4% of the total number of respondents.

In contrast, other factors such as “workplace” and “work environment” are not dominant in the choice of career of college students majoring in tourism. From the perspective of tourism undergraduates, the nature of the work unit, economic income and benefits, and industry prospects are the three main factors in choosing a job, accounting for 40.4%, 26.28%, and 13.05% of the total number of respondents, respectively. The factor of “professional counterparts” accounted for 0%, which, to a certain extent, indicates that undergraduates majoring in tourism do not follow the direction of their majors in choosing a job, and the phenomenon of talent flowing to other industries is widespread. In the tourism master's degree students, “personal development” became the first factor in their choice of job, economic income, and welfare in their choice of job also highlights the critical influence, accounting for 26.3% of the total number of people surveyed, the industry outlook has become the third factor of influence, the workplace, working environment, the nature of the work unit, The impact of factors such as work location, work environment, nature of work unit, and professional counterparts in general.

**Table 2. The influencing factors of career orientation**

<table>
<thead>
<tr>
<th>Employment factor</th>
<th>Tourism major</th>
<th>Tourist undergraduate</th>
<th>Major graduate students in tourism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal development</td>
<td>40.60%</td>
<td>9.82%</td>
<td>28.63%</td>
</tr>
<tr>
<td>Workplace</td>
<td>2.24%</td>
<td>3.65%</td>
<td>6.22%</td>
</tr>
<tr>
<td>Industry outlook</td>
<td>25.40%</td>
<td>13.05%</td>
<td>19.07%</td>
</tr>
<tr>
<td>Economic income and benefits</td>
<td>26.66%</td>
<td>26.28%</td>
<td>26.30%</td>
</tr>
<tr>
<td>Working environment</td>
<td>2.05%</td>
<td>6.80%</td>
<td>9.85%</td>
</tr>
<tr>
<td>Work item property</td>
<td>2.05%</td>
<td>40.40%</td>
<td>6.55%</td>
</tr>
<tr>
<td>Professional correlation</td>
<td>1%</td>
<td>0</td>
<td>3.38%</td>
</tr>
</tbody>
</table>

### 3.1.3 Structural composition of human resources for tourism

In this section, we will explore the structural composition of human resources in Xinjiang tourism from four perspectives: professional structure, academic structure, title structure, and age structure, as shown in Table 3. In the educational structure, the proportion of college and above-educated talents in Xinjiang tourism human resources reaches 42.5%. Still, undergraduate and above highly educated talents only account for 11.66%, and postgraduate and above are even only 0.84%, less than 1%, and the highly educated talents are obviously less. The tourism industry in Xinjiang suffers from a severe shortage of highly educated talent. The professional composition of tourism human resources is relatively complex, mainly divided into tourism, management, foreign languages, and other specialties. Xinjiang tourism human resources account for only 24.55% of tourism professionals, while non-tourism-related personnel account for nearly 80%, and tourism management personnel specialization is not high. In terms of tourism titles, the personnel with professional titles in the tourism industry of Xinjiang accounted for 58.18% of the directly employed personnel, but only 8.42% of the personnel with senior titles, and there is a severe shortage of senior tourism talents. More than 40% of the total number of employees did not obtain a promotion, and the proportion of employees who received promotions is still dominated by beginners, with a proportion of 27.26%. Most of the employees in the tourism industry in Xinjiang are under 35 years old, and the age group of 25-35
years old accounts for 45.28% of the total employees, while the age group of 45 years old and above accounts for only 9.2%, which is basically in line with the characteristics of the tourism industry as a labor-intensive industry.

Table 3. The structure of the human resources structure of tourism

<table>
<thead>
<tr>
<th>Type of structure</th>
<th>Constituent index</th>
<th>Structural ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional structure</td>
<td>Tourist class</td>
<td>24.55%</td>
</tr>
<tr>
<td></td>
<td>Management class</td>
<td>28.6%</td>
</tr>
<tr>
<td></td>
<td>Foreign language class</td>
<td>0.03%</td>
</tr>
<tr>
<td></td>
<td>Other classes</td>
<td>46.82%</td>
</tr>
<tr>
<td>Educational structure</td>
<td>Below high school</td>
<td>17.05%</td>
</tr>
<tr>
<td></td>
<td>High school</td>
<td>40.45%</td>
</tr>
<tr>
<td></td>
<td>junior college</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>undergraduate</td>
<td>11.66%</td>
</tr>
<tr>
<td></td>
<td>graduate</td>
<td>0.84%</td>
</tr>
<tr>
<td>Job title structure</td>
<td>title of a senior professional post</td>
<td>8.42%</td>
</tr>
<tr>
<td></td>
<td>medium-grade professional title</td>
<td>22.5%</td>
</tr>
<tr>
<td></td>
<td>Junior title</td>
<td>27.26%</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>41.82%</td>
</tr>
<tr>
<td>Age structure</td>
<td>Under 25</td>
<td>27.52%</td>
</tr>
<tr>
<td></td>
<td>25-35 years old</td>
<td>45.28%</td>
</tr>
<tr>
<td></td>
<td>35-45 years old</td>
<td>18%</td>
</tr>
<tr>
<td></td>
<td>Over 45 years old</td>
<td>9.2%</td>
</tr>
</tbody>
</table>

3.2 Forecast of human resources demand for tourism in Xinjiang

The forecast demand for tourism human resources in Xinjiang's states and cities from 2024 to 2027 is shown in Figure 2. Overall, with the incentives given by the Chinese government to the tourism industry in all towns and provinces, the tourism industry in Xinjiang will continue to grow steadily in the future, and the demand for tourism human resources will expand further. The demand for tourism human resources in Xinjiang is forecast to reach 1,396,100 person-times in 2024 and is expected to break through 2 million person-times to reach 2,177,900 person-times in 2027. The economic levels of Xinjiang's states and cities determine the demand for tourism human resources. All states and cities have the highest economic level, with Urumqi being the capital city of the autonomous region. In the forecast, Urumqi's demand for tourism human resources will continue to account for more than 20% of the entire autonomous region of Xinjiang. Still, along with the development of the tourism economy in other states and cities, its share will slowly decrease. Shihezi, Kezhou, Hotan, and Altay, as states and cities with shorter development time and more developed tourism resources, are forecasted to have a demand for tourism human resources of 0.37, 0.53, 0.74, and 0.92 million trips, less than 10,000 in 2024, respectively. The development will continue until 2027, surpassing the demand of 10,000 person-times, and it is predicted to reach 5.66, 4.26, 4.49, and 62,300 person-times in 2027, respectively.
Supply Side Reform of Tourism in Ethnic Areas Empowers Common Wealth--Based on the Perspective of Tourism Human Resources

Figure 2. Prediction of human resource requirements in Xinjiang

4 Path Countermeasures of Tourism Supply-Side Reform in Ethnic Areas

The real purpose of the supply-side structural reform of tourism in ethnic areas is to ensure that tourism drives employment and improves people's living standards, thus promoting sustainable development of tourism in ethnic regions. Combined with the human resource profile and demand forecast of the Xinjiang Uygur Autonomous Region, countermeasures for tourism supply-side reform in ethnic areas are proposed to achieve shared prosperity.

1) Improve the supply level and enhance the service capacity of tourism human resources. The government actively promotes and strengthens guidance to establish correct service concepts. At the same time, it improves relevant service skills to provide civilized, thoughtful, and high-quality services for tourists who come to see, vacation, and stay.

2) Change the concept of management and increase the investment in tourism human resources development. The talent supply side represents the essence of supply-side reform. To build a talent identification system and strive to create a system of knowledge, evaluation, and development of people. Pay attention to the dimensions of potential, ability, and sentiment of talents. Combine different sizes into a value evaluation matrix and conduct regular human resources inventory.

3) Optimize the tourism human resource system and pay attention to talent cultivation and reserve. Optimize the overall structure of scenic staff and achieve the optimization of the academic, age, and professional structures of scenic staff through recruitment and configuration. Establish a multi-level and open talent training system, determine the training objectives and contents on the basis of the training demand survey, determine the training courses and training methods according to the training contents, and then carry out training evaluation to realize the transformation of training results.

5 Conclusion

This paper proposes a model for tourism human resources demand forecasting that can be used to reference supply-side reform path countermeasures for tourism in ethnic areas. At the same time, it
analyzes and discusses the human resource profile and demand forecast for ethnic tourism in the Xinjiang Uygur Autonomous Region of China. Here is how the study is summarized:

1) From 2013 to 2022, the proportion of tourism employment in Xinjiang to the total employment in the whole autonomous region increased from 14.98% in 2013 to 17.22% in 2022. The number of direct tourism jobs has grown to 393,000 people. The percentage of direct tourism employment in total tourism employment is less than 20%, and there is still a significant amount of potential and room for growth.

2) In 2022, the total number of tourism students in Xinjiang reached 6,189, of which the number of students in higher education institutions and secondary vocational schools were 5,619 and 1,223, respectively. The number of students in secondary vocational schools fluctuated, but the overall trend continued to rise. The number of students in 2022 increased by 65.07% compared to that of 2013.

3) In terms of the structure of tourism human resources, the proportion of college and above-educated talents in tourism human resources in Xinjiang educational structure reaches 42.5%. Still, the proportion of highly educated talents with bachelor's degrees or above only accounts for 11.66%, and highly educated talents are obviously less. Tourism human resources in tourism professionals account for only 24.55%. Non-tourism-related categories still account for nearly 80%. Specialization in tourism management personnel is not high. Only 8.42% of tourism human resources have senior titles, and there is a severe shortage of senior tourism talent. 45.28% of all tourism employees are in the age group of 25-35 years old, and only 9.2% are in the age group of 45 years old and above.

4) The demand for tourism human resources in Xinjiang is forecast to reach 1,396,100 in 2024 and is expected to reach 2,177,900 in 2027. Urumqi's share of the entire Xinjiang autonomous region will continue to exceed 20% but will slowly decrease with the development of the tourism economy in other states and cities. Shihezi City, Kezhou, Hotan, and Altay regions are expected to continue growing until 2027 and exceed the demand for tourism human resources by 10,000 people.

Funding:

This research was supported by the General project of National Social Science Fund in 2012: Study on red tourism development model in border minority areas (12BJY127).

References


Supply Side Reform of Tourism in Ethnic Areas Empowers Common Wealth--Based on the Perspective of Tourism Human Resources


