A Study on "Internet +" Eco-production and Eco-tourism Mode for Agricultural Enterprises

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Abstract "Internet +" eco-production and eco-tourism carried out by agricultural enterprises is one of ways to increase income. Urban economic development index evaluation value (ui), agricultural enterprises’ eco-production and eco-tourism index evaluation value (ui) and Internet popularity index evaluation value (ui) constitute the ternary coupling system. The ternary coupling coordination degree (Di) combined with u1 can be used to judge whether the agricultural enterprises practise eco-production and eco-tourism mode. When u1 ≥ 0.5000, D1 ≥ 0.6000, the autonomous mode for agricultural enterprises can be used; when 0.4000 < u1 < 0.5000, 0.5000 < D1 < 0.6000, the mode of cooperation with travel agency can be used; when 0.3000 ≤ u1 < 0.4000, 0.4000 ≤ D < 0.5000, the tourism business transfer mode can be used; when u1 < 0.3000, D < 0.4000, the tourism business should not be carried out. All the above four modes require "Internet +".

Key words Agricultural enterprises, Eco-production and eco-tourism, Internet +, Ternary coupling coordination

1 Introduction

Agricultural enterprises are generally small businesses, with low profits, greatly affected by market, climate and other factors. In addition, agricultural enterprises also have the following characteristics. The agricultural enterprises are mostly located in peri-urban areas, their products are provided to meet urban life demand, with good transportation and communication conditions. The agricultural enterprises occupy a large area, and enjoy good natural conditions. Generally, the breeding and farming enterprises occupy a large area, which can provide environmental conditions for many tourists to visit and participate in production activities. The agricultural enterprises have a close economic collaboration relationship with local farmers, rent land, forests or ponds; or hire local farmers; or cooperate with village and township to form a stock company. There is a high vacancy rate in rural houses. Rural housing area is large, leaving a small population in the family. After being slightly transformed, the vacant houses can be rent to tourists at a very low price. The seasonal labor and idle labor in agricultural enterprises can provide some of the services for tourism. The above features determine that the agricultural enterprises can carry out a new mode of tourism — agricultural enterprises’ eco-production and eco-tourism. According to Changsha agricultural enterprises statistics in 2015 [1], there were 32 food growers, 10 vegetable planting companies, 8 tea planting companies, 112 livestock breeding companies, 41 poultry breeding companies and 8 special breeding companies around Changsha, all having the above characteristics. The resource conditions of agricultural enterprises, degree of urban economic development and degree of Internet popularity interact with each other to form a ternary coupling body. The degree of coupling coordination can provide a quantitative benchmark for agricultural enterprises, and a judgment rule for the agricultural enterprises to carry out this work.

2 Urban economic development index evaluation value (ui)

The urban economic development index evaluation value (ui) involves a plurality of secondary index evaluation parameters concerning urban travel [2-3]. In order to highlight the relationship between urban economic development and agricultural enterprises’ eco-production and eco-tourism, this paper selects four secondary evaluation indices: urban per capita GDP (Ci1); urbanization rate (Ci2); per capita disposable income of urban residents (Ci3); urban road network density (Ci4). Taking Changsha City for example [4], the four secondary index evaluation values (2008–2013) can be shown in Table 1. The secondary weights calculated using standard deviation method [2], the dimensionless processing is first performed on Ci1, Ci2, Ci3, Ci4, and the non-dimensional values are calculated (Table 1). The primary dimensionless index evaluation value ui during 2008–2013 is calculated as follows:

\[ u_i (\text{Year}) = \sum \alpha_i \mu_i (\text{Year}) \]  

(1)

3 Agricultural enterprises’ eco-production and eco-tourism index evaluation value (u2)

Agricultural enterprises’ eco-production and eco-tourism specifically refers to the process of visiting in the agricultural production and processing enterprises, participating in the production, leasing part of the agricultural materials and harvesting the corresponding agricultural products. There are 5 secondary index evalu-
The coupling degree \( C_s \) of the binary system \([3, 7-8]\) is calculated:

\[
C_s = \left\{ (u_i \times u_j) / \left[ (u_i + u_j) \times (u_i + u_j) \right] \right\}^{1/2}
\]  

(3)

The coupling degree of the ternary system is calculated:

\[
C_s = \left\{ (u_i \times u_j \times u_k) / \left[ (u_i + u_j + u_k) \times (u_i + u_j + u_k) \times (u_i + u_j + u_k) \right] \right\}^{1/3}
\]  

(4)

To prevent the high coupling distortion of \( u_s \) value in the low-value region, the coupling coordination degree \( (D_s) \) is introduced in practice.

\[
D_s = \sqrt{C_s T_s} \quad T_s = \sum \alpha u_i \left( \sum \alpha = 1 \right)
\]  

(5)
Assuming that there is no change in the eco-production and eco-tourism for agricultural enterprises in the five years, that is, \( u_2 \) is a constant value. The subjective assignment method is used for the primary weight \((\alpha_i)\) of ternary system coupling, \( \alpha = (0.4, 0.3, 0.3) \). Using Changsha’s economic development index \( (u_1)\), agricultural eco-production and eco-tourism index of Changsha Jingjing Tea Factory \( (u_2)\) and Internet popularity index \( (u_3)\), we calculate the coupling degree \( (C_i)\) and coupling coordination degree \( (D_i)\) of the ternary system (Table 4). At the same time, in order to confirm the coupling relationship between urban economy and Internet popularity, we calculate the binary system. We calculate the \( C_{economy \ and \ Internet} \) and \( D_{economy \ and \ Internet}\) coupling value of binary system. The annual changes in \( u_1 \), \( u_2 \) and \( u_3 \) values can be shown in Fig. 1. It clearly indicates the coordination and coupling relationship, \( C_{economy \ and \ Internet} \) and \( D_{economy \ and \ Internet}\) are well coupled and coordinated. If \( D_1 \), \( D_{economy \ and \ Internet}\) is below 0.4000, it is in imbalance region; if \( D_1 \), \( D_{economy \ and \ Internet}\) is 0.4000 - 0.5000, it is in basically coordinated region; if \( D_1 \), \( D_{economy \ and \ Internet}\) is greater than 0.5000, it is in the well coordinated region . The annual change insuggests that even if the agricultural enterprises’ eco-production and eco-tourism conditions are not improved, the ternary coupling coordination degree will improve with the urban economic development and the popularity of the Internet, and can enter the well coordinated region and basically coordinated region.

| Table 4 Annual calculated value of Economy and Internet and Decomomy and Internet |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Year                           | \( u_1 \)       | \( u_2 \)       | \( u_3 \)       | \( C_{economy \ and \ Internet} \) | \( D_{economy \ and \ Internet} \) |
| 2009                           | 0.1161          | 0.3500          | 0.4195          | 0.2890          | 0.4072          |
| 2010                           | 0.4663          | 0.3500          | 0.4999          | 0.4917          | 0.4830          |
| 2011                           | 0.6663          | 0.3500          | 0.4896          | 0.4950          | 0.5050          |
| 2012                           | 0.3899          | 0.3500          | 0.4866          | 0.5040          | 0.4988          |
| 2013                           | 1.0000          | 0.3500          | 0.4877          | 0.4988          | 0.6595          |
| Primary weight                 | 0.4             | 0.3             | 0.3             | 0.3             | 0.6             |

6 Agricultural enterprises’ eco-production and eco-tourism mode in the era of “Internet +”

Agricultural enterprises should carry out the eco-production and eco-tourism according to the index evaluation \( (u_2)\) and the ternary coordination degree \( (D_i)\) of Internet, urban economy and agricultural enterprises’ conditions. There are four modes to choose. Mode 1: When \( u_2 \geq 0.5000 \) and \( D_i \geq 0.6000 \), the agricultural enterprises can choose the autonomous mode for eco-production and eco-tourism, and market their tourism projects on the Internet. For example, Changsha Baiguoyuan Ecological Agriculture Co., Ltd. is located in Wangcheng County, and now merged into the urban area of Changsha. The eco-production and eco-tourism items include fruit picking (more than 20 kinds of fruit varieties), farm fun, bamboo barbecue, milking, fishing and soy milk grinding, bringing considerable economic income. Mode 2: When \( 0.4000 \leq u_2 < 0.5000 \) and \( D_i < 0.6000 \), the mode of cooperation with travel agency can be used (Fig. 3). Due to the multiplier effect of tourism economy, the agricultural enterprises can get great benefits. Mode 3: When \( 0.3000 \leq u_2 < 0.4000 \), \( 0.4000 \leq D_i < 0.5000 \), the tourism business transfer mode can be used. Travel agencies acquire the tourism business of agricultural enterprises through the investment. Agricultural enterprises can get part of the proceeds and enhance the competitiveness of their agricultural products, thereby solving the problem of difficult sale of the main products. (To page 33)
role in the development of rural education[12]. Therefore, it is recommended to focus on strengthening the construction of sports in rural schools, take rural sports teachers as the main body, cultivate rural sports backbone, and provide rural social sports instructors, to guide farmers to take physical exercises in a scientific and reasonable manner.

4 Conclusions

Due to the particularity of rural issues, there will be a long way to achieve sustainable development of rural sports. Simply relying on several policies and regulations and allocating certain sports facilities, it is impossible to solve these issues. Apart from the sports system itself, issues of rural sports also involve the economic, social, cultural, human resources and many other aspects. Through the study, we concluded that factors influencing the sustainable development of rural sports include objective factors such as government and society, and also include subjective factors such as rural areas and farmers. Only until both objective and subjective factors are solved, may it be able to realize healthy and sustainable development of rural sports.

References

[3] YU YY. Study on the system construction of new rural community sport industry. Changsha Jinjing Tea Factory can use this mode. Mode 4: When $u_2 < 0.3000$, $D < 0.4000$, the tourism business should not be carried out so as not to waste money and manpower.

7 Conclusions

China is experiencing high-speed urbanization process. On the one hand, a large number of suburban farmlands and villages are occupied by the city and the landless farmers turn into urban population; on the other hand, the central area of the city is experiencing drastic urban construction, so as to improve the land exchange value in the central area and make the original residents move to the city periphery. This turbulence makes the new and old urban residents bear the pressure of uncertainty and challenge. The agricultural enterprises’ eco-production and eco-tourism featured by rural natural landscape, local culture and strong participation, can meet their needs for relaxation and leisure, and it is really the most economical green tourism returning to the original state of life. This way of tourism has been prevalent in foreign countries for many years. In the era of "Internet +", expanding the eco-production and eco-tourism can make the agricultural enterprises in the vicinity of Chinese Cities develop by leaps and bounds.

References