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THE INFLUENCE OF ECOENVIRONMENT FACTORS ON THE DEVELOPMENT OF SKIING

Abstract: Skiing depends on the external environment, in which material, energy and information are frequently exchanged, and this external environment greatly affects the quality of skiing's existence. In this article, an ecosystem assessment algorithm based on ANN (Artificial Neural Network) is put forward. Based on this, a skiing development model under the influence of ecosystem factors is constructed to explore the influence of ecosystem factors on skiing development. The simulation results show that after many iterations, the error of this method is better than that of the comparison algorithm in ecosystem analysis, with the error reduced by 28.17 % and the recall rate reaching 94.65 %, which is improved by 16.88 % compared with the comparison algorithm. Therefore, this model can provide theoretical support for studying the influence of ecological and environmental factors on the growth of skiing. Based on the analysis of the characteristics of the regional landscape ecosystem, the eco-environmental impact assessment of the ski resort project predicts the impact of project construction on the regional landscape ecosystem. It explores ways and means to maintain the ecological integrity of the natural system to carry out project construction on the premise of protecting the local ecosystem and building a natural and artificial composite landscape ecosystem with reasonable structure and high efficiency.

Keywords: ecosystem, skiing, assessment, regional landscape ecosystem

Introduction

Skiing is a popular sport. In the modern history of human development, skiing, from economic life to sports competition, is a continuous growth of human social productivity [1]. The ecosystem is the condition and material source for human survival. However, in the development and operation process, most ski resorts have little awareness of sustainable development. They only consider maximising economic benefits, focusing on immediate benefits, and paying no attention to maintenance and follow-up investment [2]. In order to distinguish the market positioning of different ski resorts, the society calls such market-oriented ski resorts, which are mainly geared to mass skiing services and consider events as tourist ski resorts, and the ski resorts specially built for competitive competitions and athlete training as competitive ski resorts. The comprehensive assessment of the ecosystem quality of competitive ski resorts is based on the regional ecosystem survey and the region's ecosystem characteristics. Select certain assessment indicators and mathematical methods to assess to judge the ecosystem quality status of different assessment units and existing problems and propose countermeasures for comprehensive management [3, 4]. With the rapid growth of the economy, environmental problems such as environmental pollution, overpopulation, energy shortage, biodiversity reduction, land

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desertification and global warming have become increasingly prominent, hindering the sustainable growth of humankind and the earth [5]. In addition, the accelerating process of urbanisation, the continuous concentration of population in cities, and the impact of natural factors such as climate change and ecosystem stress, as well as the decision-making and management of regional governments, the environmental awareness of citizens, the surrounding environment of cities and other human factors, make the urban ecosystem vulnerable [6].

The urban ecosystem is under increasing pressure, and its support for human development is gradually becoming limited. The urban ecosystem has shown unhealthy symptoms, and various ecological crises have appeared in the city, endangering the healthy life of urban residents [7]. Based on the analysis of the characteristics of the regional landscape ecosystem, the eco-environmental impact assessment of the ski resort project predicts the impact of project construction on the regional landscape ecosystem. It explores ways and means to maintain the ecological integrity of the natural system to carry out project construction on the premise of protecting the local ecosystem and building a natural and artificial composite landscape ecosystem with reasonable structure and high efficiency [8]. Human beings must deeply reflect on the past urban development process. Various problems, soberly understand and bravely face the fact that the urban ecosystem is unhealthy, explore the factors and mechanisms of unhealthy symptoms of an urban ecosystem from the aspects of population, economy, society, resources, ecology and environment of the urban ecosystem, and put forward corresponding control countermeasures [9]. This article explores the influence of ecological and environmental factors on the growth of skiing, puts forward the countermeasures of urban ecosystem regulation, promotes the urban ecosystem to return to a healthy state, realises the complete coordination of the urban ecosystem while maintaining its structure and function, and ensures that the urban ecosystem can provide services for human society for a long time while resisting stress and restoring ability.

Due to the geographical location characteristics of the ski industry, the development and construction of ski resorts are mostly distributed in mountainous areas, forest areas and agricultural and pastoral areas, far away from central cities and economically developed areas. Most ski resorts and surrounding areas used to be barren hills, and the economy was relatively backward. Due to the construction of ski resorts, skiers from all over the country flocked to them, which changed the economic outlook of mountain villages in forest areas to a certain extent and promoted the growth of the regional economy [10]. The extraordinary growth of the ski industry in China from scratch, from small to large, has benefited from the reform and opening up and the continuous improvement of people's living standards. However, the ski industry in China started late, and its foundation is weak. It belongs to a relatively weak link in the international industrial division chain. Whether the ski industry can develop and be sustainable requires the joint efforts of the relevant government management departments, industry insiders and the whole society [11]. A city is a regional spatial system with complex characteristics, so it is necessary to analyse the health status of the urban ecosystem from the perspective of a complex system and spatial differentiation. This article constructs the development model of skiing under the influence of ecosystem factors. It mainly includes the following innovations:

(1) This article will build a skiing development model under the influence of ecological and environmental factors, analyse the data generated by information

dissemination among network nodes, and optimise the skiing development forecast by using the algorithm in the field of ANN (Artificial Neural Network).

(2) This article reveals the internal and external factors of the growth of the ski industry, seeks the development opportunities of the ski industry in combination with the development opportunity of ecological civilisation construction, and tries to build the development path of the ski industry under the background of ecological civilisation construction.

Protecting the ecosystem and realising sustainable development is a basic policy that needs to be adhered to in the modernisation of China. Kasada et al. [12] discussed the theory and method of establishing the index system of urban ecosystem health assessment. However, they did not present any definite, quantifiable index and corresponding assessment model. Chiu et al. [13] took vitality, organisational structure, resilience, maintenance of ecosystem functions and health status of people as assessment elements and constructed a health assessment model of the urban ecosystem. Martino et al. [14] established an ecosystem health index system from a biophysical, ecological, and socio-economic index. Fatemeh et al. [15] established an index system of ecosystem health assessment from the relationship between the environment, human health, skiing development and public policies. Liu et al. [16] established a wetland ecosystem health assessment index system according to the characteristics of the wetland ecosystem. Steenberg et al. [17] discussed the indicators of a holistic assessment of farmland ecosystem health. They established an index farmland ecosystem health assessment system that combined environment, structure, sustainability, productivity and management. Because of the problems and management status of the river ecosystem, elaborated the significance, use and key technologies of the application of the theory of ecosystem health in the water environment management of China's river basins [18]. Islam et al. [19] applied the fuzzy assessment model to urban ecosystem health and made corresponding assessments and research on urban ecosystem health. Koch et al. [20] used principal component analysis to determine the main indicators and weights of urban ecosystem health assessment. They established a fuzzy optimisation assessment model for the uncertainty of assessment criteria. The model can well compare the health level differences between cities. However, it is difficult to identify the relative health level of urban subsystems, nor can it distinguish the spatial differences of urban composite ecosystem health. Gao et al. [21] proposed an urban ecosystem health assessment model integrating the distance index and coordination index, emphasising the analysis of urban ecosystem health from the perspective of composite systems and spatial differentiation. Wu et al. [22] aiming at the uncertainty and incompleteness of the indicator assessment standards in such studies at present, propose to establish a relatively complete assessment indicator system and assessment methods in combination with qualitative and quantitative analysis and apply them to practical cases to provide the scientific basis for the healthy operation and adaptive management of urban ecosystems and the coordinated growth of urban ecology, economy and society.

Methods and materials

The urban ecosystem is a whole system in which human beings are the main body, other creatures interact with the surrounding natural environment and artificial environment, and the complex network structure is formed by the interaction between urban

residents and their environment. The openness of the urban ecosystem is the prerequisite for the sustainable growth of the urban ecosystem, and it is also the existing condition for the stability of the urban ecosystem. If the urban ecosystem is in a closed state, without any exchange with the outside world, then the urban ecosystem will spontaneously move towards chaos and disorder [23]. The sustainable growth of skiing is to meet the current needs of skiers and tourists while maintaining and enhancing future development opportunities and to meet the needs of economic and social development and aesthetics while maintaining cultural integrity, basic ecological process, biodiversity and life support system. As the urban ecosystem inputs material, energy and information from the external system, it also outputs material, energy and information to the external system. Therefore, an urban ecosystem's energy transformation and material circulation are open systems.

The growth of subsystems of the urban complex ecosystem is coordinated among subsystems and within subsystems, and it is impossible to seek the good development level of other subsystems or elements at the expense of the growth of one subsystem or element. That is, the development degree of the system and subsystem and the coordination degree among subsystems jointly determine the health state of the urban ecosystem. There are internal relations and interactions among the elements in the urban ecosystem, which make the urban ecosystem an organic whole with specific functions. Therefore, when evaluating the health of the urban ecosystem, we should not only analyse the elements that make up the urban ecosystem, but also study the interaction and connection between internal elements, as well as the connection between the external environment and region, and consider the urban ecosystem as a whole.

The Ski ecosystem consists of the ski system and its ecosystem, which depend on each other and influence each other to form a dynamic balance system for common development. There are four ecological factors in the skiing ecosystem: natural environment factor, economic environment factor, sports system factor and sports demand factor. The mechanism and principle of their operation are that human beings will have certain sports demands in a certain social environment. Looking for the origin or reality from the perspective of information and image is equivalent to a broader and more generalised observation. That is, it observes the simple fine-grained relationships, such as position change and movement, and the more complex relationships. Under a certain demand system and institutional environment, skiing has different demand and resource niches. By competing with other cultural forms with the same cultural functions, skiing will show a certain ability to obtain resources, thus showing a specific living state. The effect of human skiing can form feedback, and this feedback will continue to affect human's ability to acquire skiing resources.

An urban ecosystem is a typical complex nonlinear dynamic system. There are universal nonlinear interactions among various elements or subsystems in the urban ecosystem, and most of their functional relationships are nonlinear. In the urban ecosystem, the change of any element is influenced not only by another single factor but also by a variety of factors. Some of these factors have a positive feedback effect on the change of this element, while others are just the opposite. Some single factors may also stimulate and inhibit the change of a certain factor.

Socio-economic environmental factors refer to a set of production conditions, including production tools, production technologies, production methods, etc., formed by human beings processing or transforming the natural environment and creating material wealth, and the level of economic development determined by this set of material

production conditions. A skiing system refers to a functional system that can be gradually formed after organising the required resources to meet the needs of human skiing. The ideal state of a healthy urban ecosystem is ecological integration. That is, the material circulation and energy flow between production, life and the surrounding environment in an ecosystem composed of nature, economy and society are not damaged, the key ecological components and organic tissues are preserved intact without diseases, and the long-term or sudden natural or manufactured disturbance can keep elasticity and stability. The urban ecosystem is a complex natural, social, and economic network. The research on the health of urban ecosystems should comprehensively assess various factors instead of only paying attention to some elements such as water, soil, air or vegetation. All these factors are integral parts of the urban ecosystem.

Ecology, as the central concept of ecological research, refers to the changes that organisms make from the aspects of morphology, physiology, biochemistry, etc., that are beneficial to their survival to adapt to environmental changes. The ecological adaptation of organisms is not only the specific shape of organisms in competition to adapt to the environment but also the result of long-term interaction between organisms and the environment. Skiing cannot exist independently without the external environment. Only by continuously exchanging material and energy with the external environment can the survival of this system be fundamentally maintained. People in different periods and different environments yearn for different sports systems. Human sports needs always adapt to the external environment, and corresponding sports systems should be set up in time according to the changes in actual conditions to achieve the best effect of human sports needs.

Analysis of results

Long-term ecological adaptation and biological evolution have led to a one-to-one correspondence between organisms and the environment supported by transformation and support because each biological species occupies a unique resource in its biological community or ecosystem and has a corresponding impact. Different sports demands, institutional norms and events have different niche widths on different resource axes. This is because the resources required by different sports overlap, and the resources are limited, so there is resource competition among different sports. Skiing has many functions. Only by meeting the corresponding needs in different demand systems can we have the possibility of survival. The higher the satisfaction of human needs, the greater the possibility of obtaining skiing resources and the stronger the potential ability of resource competition. In order to avoid the loss of important information caused by the rejection of special data, the quantitative data with large differences in data distribution interval can be discretised.

After many iterations, the error of this method is better than that of the comparison algorithm in ecosystem analysis, with the error reduced by 28.17 % and the recall reaching 94.65 %, which is 16.88 % higher than that of the comparison algorithm. Therefore, the ecosystem assessment algorithm based on ANN is a reasonable and feasible assessment model, which can provide theoretical support for studying the influence of ecosystem factors on the growth of skiing. The urban ecosystem health assessment method constructed in this article effectively combines the complex characteristics of the urban ecosystem with the regional spatial characteristics and overcomes the shortcoming of previous similar

studies that only pay attention to the overall situation of the urban complex ecosystem but neglect the subsystem research which is more practical for decision-making and construction; thus it can more comprehensively characterise the health status of the urban ecosystem and is more suitable for guiding the practice of urban ecosystem construction. By establishing the distance index and coordination index to construct the urban ecosystem health index, it can well describe the composition of the urban ecosystem health level, the development level and the coordination status of various elements of subsystems within the system. The model can not only be used to compare and analyse the health status of different cities but also reveal the spatial differentiation law of the ecosystem health of a single city.

Conclusion

The extroversion and combination of the skiing industry endow itself with strong cross-industry activity. Through cross-cooperation with other industries, the diffusion effect of the skiing industry can penetrate many different fields. The correlation of industry development depends on the growth of other industries. Coordinating the internal and external relations of industries is particularly important for the growth of the ski industry. This article reveals the internal and external factors of the ski industry development. It seeks the development opportunity of the ski industry in combination with the development opportunity of ecological civilisation construction.

Furthermore, put forward an ecosystem assessment algorithm based on ANN and, based on this, built a skiing development model under the influence of ecosystem factors to explore the influence of ecosystem factors on skiing development. After many iterations, the error of this method is better than that of the comparison algorithm in ecosystem analysis. The error is reduced by 28.17 %, and the recall rate reaches 94.65 %, which is improved by 16.88 % compared with the comparison algorithm. Therefore, the ecosystem assessment algorithm based on ANN is a reasonable and feasible assessment model, which can provide theoretical support for studying the influence of ecosystem factors on the growth of skiing. The skiing ecosystem in a certain social environment is bound to produce human sports needs suitable for this system. Human beings must constantly create their institutional environment to meet the need of this sport. Only when skiing shows different living conditions can its certain effects be transformed into evolution, competition and feedback mechanisms that constantly adapt to the external environment changes.

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