Original Research Article

Environmental science contributes to the research on the path of ecological sustainable development of world-class smart scenic spots from an interdisciplinary perspective required information

Youchun Xiong[1], Yan Ke[2], Yu Li[3], Jiankun Jin[4], Yunquan Chen[5]

1 Mechanical and Electronic Engineering, College of Mechanical and Electrical Engineering, Yunnan Agricultural University, Kunming, Yunnan, 650201, China

2 College of Food Science and Technology, Yunnan Agricultural University Kunming, Yannan, 650200, China

3 Landscape Architecture in the College of International, Yunnan Agricultural University, Kunming, Yunnan, 650201, China

4 College of Food Science and Technology, Yunnan Agricultural University Kunming, Yunnan, 654100, China

5 College of Tobacco, Yunnan Agricultural University, Kunming, Yunnan, 650201, China

Abstract: From the macro perspective of environmental science, this paper takes the construction of world-class smart scenic spots as the starting point to deeply analyze the key role of the integration of mechanical and electronic engineering and landscape architecture, as well as the impact of this integration on the ecology of food and tobacco industry. This paper analyzes the application of advanced technology of mechanical and electronic engineering, such as intelligent monitoring and management system, in the construction of smart scenic spots, and expounds the positive shaping of the ecological environment of scenic spots by combining the ecological design concept of landscape architecture. This paper further discusses how the integration has a profound impact on the food and tobacco industry ecology from the aspects of production environment optimization and supply chain sustainable development, reveals the important value of multidisciplinary integration in promoting the sound development of industrial ecology, and provides theoretical support and practical path for realizing the development of environmentally friendly industries.

Keywords: Environmental science; World-class smart scenic spot; Integration of mechanical and electronic engineering and landscape architecture; Ecology of the food and tobacco industry; Big data analysis

1. Introduction

In the 21st century, due to the importance of environmental protection and sustainable development, scientific research focuses on world-class smart scenic spot construction. The scenic spots combine technology and environmental protection to achieve self-renewal. This study aims to explore the integration of mechanical and electronic engineering and landscape architecture to enhance environmental value and promote related industries' ecological transformation. We collect and analyze data to understand how to plan, design and maintain landscape architecture and reduce the environmental impact of food and tobacco production, hoping to promote their green and sustainable transformation and provide support for future environmental science practice and ecological civilization construction.

2. Integration in world-class smart scenic spot construction

2.1. Mechanical and electronic engineering applications

In smart scenic spots, mechanical and electronic engineering is applied in multiple aspects.[1]The intelligent monitoring and maintenance system uses sensor networks and drones to monitor the environment and facilities in real time and provide data for quick response. Electronic information technology is used in smart tour guide systems, such as AR and GPS, to improve tourist experience. The intelligent traffic management system with signal control and unmanned vehicles relieves traffic pressure and reduces emissions. The intelligent security system uses face recognition and behavior analysis to enhance security. These applications optimize management and protect the ecological environment, laying a foundation for smart scenic spots.

2.2. Role of landscape architecture

Landscape architecture in smart scenic spot construction shapes the ecological environment, improves tourist experience and promotes sustainable development.[2]It combines with advanced technology to monitor ecological indicators like soil moisture and plant status. Guided by intelligent design, it optimizes spatial layout, improves environmental carrying capacity and ecological recovery ability. With the intervention of mechanical and electronic engineering, it has intelligent functions like automatic watering and energy-saving lighting, reducing resource waste and environmental load. It is a link between man and nature, conforms to the innovation needs of smart scenic spots, and promotes ecological civilization while providing sustainable power for the scenic spot ecosystem.

2.3. Advantages and innovations of integration

The integration shows significant advantages. [3]Intelligent technology enables precise landscape layout planning, optimized garden resource management and enhanced visitor experience. The mechanical and electronic system improves automation and realizes real-time environmental monitoring and management. It not only improves maintenance efficiency but also reduces resource consumption, promoting scenic spot construction to a higher level of environmental protection and intelligence and providing a new path for related industries' sustainable development.

3. Impact on the ecology of the food industry

3.1. Development status around scenic spots

During the construction of world-class smart scenic spots, the food industry around them has a unique development. With the increase in tourists and demand for eco-friendly products, it expands rapidly, with changes in commodity types, production scale and technology level. It mainly includes characteristic agricultural products, catering and processing enterprises. These companies provide choices and attract consumers with eco-labels. However, it has a double impact on the local ecology. It promotes the regional economy but also brings environmental pressure like resource consumption and waste. Under pressure and demand, many food companies explore sustainable methods, introduce advanced technologies and optimize processes to balance economic and ecological interests. In the smart scenic spot framework, the integration helps optimize the food industry, improve resource utilization and reduce ecological footprint, leading to a new business model and promoting green transformation.

3.2. Positive impact of fusion

The integration has a significant positive impact on the food industry ecology. In smart scenic areas, smart technology makes food production more efficient and environmentally friendly. Smart sensors and analysis systems monitor and optimize crop growth environment, reducing chemical pollution. Meteorological and soil data help determine the best planting and harvesting times, improving yield efficiency. Machinery automation improves production and processing efficiency, reduces labor and energy costs and carbon footprint. The circular economy model in smart scenic spots treats food waste, converts it into organic fertilizer and realizes resource recycling. The combination of landscape architecture and the food industry promotes the sustainable development of local specialty products, expands marketing through tourist flow and smart platforms, improves local economic income, endows the food industry with cultural and educational functions, and promotes the spread of green consumption concepts, comprehensively promoting the food industry ecology to a new level of sustainable development.

4. Impact on the ecology of the tobacco industry

4.1. Relationship with Scenic area environment

The tobacco industry has a complex relationship with the scenic area environment.[4] Its planting and processing promote economic development but also bring environmental challenges like water resource consumption and pollution. These may affect the ecological balance of the scenic spot and its sustainable development. Emissions from processing plants also affect air quality. With the development of smart scenic spot construction, the integration of mechanical and electronic engineering and landscape architecture provides a solution. Intelligent monitoring and control technology manages resource use and environmental impact, reduces damage to the scenic environment. Landscape architecture design provides an ecological buffer, and intelligent equipment and automation technology improve management efficiency, reduce chemical use and pollution emissions. Applying environmental science principles optimizes the production process, improves resource utilization and achieves green transformation, promoting positive interaction between the tobacco industry and the scenic area environment and sustainable development.

4.2. Changes brought about by convergence

In smart scenic spot construction, the integration changes the ecology of the tobacco industry.[5]Mechanical and electronic engineering accurately monitors and regulates the tobacco growing and processing process through intelligent sensors and automatic control systems, reducing resource waste and pollution. Landscape architecture provides a development model in harmony with the surrounding landscape, improves the ecological quality of the scenic area and the natural vitality of the soil, and improves the growth quality of tobacco leaves. The construction of smart scenic spots encourages the green transformation of the tobacco industry, controls exhaust gas and sewage emissions through low-carbon design, and provides a new path for sustainable development and a model for ecological construction. The combination of knowledge from various fields promotes scientific and technological progress and supports industrial transformation, making the future of the tobacco industry more green and sustainable.

5. Challenges and solutions for multidisciplinary integration

5.1. Technical integration problems

In smart scenic spot construction, the integration of mechanical and electronic engineering and landscape architecture faces technical integration challenges. Compatibility issues exist among various technical systems. The wide variety of intelligent technologies and devices in mechanoelectronic engineering requires complex protocols and data format conversion for integration with landscape architecture design. Sensors and data acquisition devices in scenic areas need to meet high precision and real-time requirements, and ensuring their long-term stable operation in complex natural environments is difficult. Seamless connectivity between smart devices and big data systems is also a key issue. Dealing with massive environmental data and establishing complex analytical models for the food and tobacco industry ecology increase the difficulty of technological integration. To solve these problems, advanced system integration technology is needed, and unified interface standards and data protocols should be developed to promote cooperation among different systems. Cross-field technical exchanges and cooperation can provide new perspectives and suggestions. Policy and financial support are crucial for technology research and development and experimental verification.

5.2. Barriers to interdisciplinary cooperation

Interdisciplinary cooperation has barriers in language and methodology. Different disciplines have differences in technical terms, thinking modes and research methods, leading to communication and understanding problems. Landscape architecture focuses on ecological aesthetics and nature harmony, while mechanical and electronic engineering focuses on technical efficiency and function realization, which may cause inconsistencies in project goals and implementation paths. The lack of an effective coordination mechanism and communication platform also hinders cooperation and resource integration. Establishing interdisciplinary joint teams, promoting open dialogue mechanisms and using comprehensive project management tools can address these challenges. Cultivating multidisciplinary talents and setting up incentive policies can promote further integration and the sustainable development of related ecological industries.

5.3. Policy and funding support requirements

Multidisciplinary integration in promoting smart scenic spot construction faces challenges in policy and funding support. At the policy level, there is a lack of specific regulations and standards for fusion innovation, lacking clear guidance. In terms of funding, high investment requirements in multiple fields may lead to resource tilt in funding allocation, limiting project promotion. The government should introduce policies to encourage innovation and allocate funds reasonably to support the sustainable development and implementation of the multidisciplinary cooperation model.

6. Concluding remarks

Based on environmental science, this study deeply discusses the construction of world-class smart scenic spots and the realization of ecological protection and sustainable development of the food and tobacco industry. The organic integration of mechanical and electronic engineering and landscape architecture is studied, and its potential value in promoting industrial ecological sustainable development is revealed. The results show that this integration can effectively reduce the environmental impact of food and tobacco production and improve ecological benefits, providing a new possibility and path for promoting their green transformation and building

ecological civilization. However, the study has limitations, such as difficulties in individual data collection and the need for further refinement and optimization of implementation strategies. Future research should focus on more integration methods, technological innovation and practical application.

About the author

Yan Ke, male, born in 2005, Han ethnicity, from Qujing City, Yunnan Province, undergraduate, and his research direction is Food Science and Engineering.

Li Yu

College of International, Yunnan Agricultural University

Kunming City, Yunnan Province

650051

No. 452, Yunnan Agricultural University, Panlong District, Kunming City, Yunnan Province

Li Yu, male, born in 2003, Yi ethnicity, from Qujing City, Yunnan Province, an undergraduate student majoring in Landscape Architecture in the College of International of Yunnan Agricultural University.

Jin Jiankun

College of Food Science and Technology, Yunnan Agricultural University

Kunming City, Yunnan Province

654100

Tongdu Shopping Mall, Dongchuan District, Kunming City, Yunnan Province

Phone: 13629489616

Author's Introduction: Jin Jiankun, male, born in October 2004, Han ethnicity, from Kunming, Yunnan Province.

Chen Yunquan

College of Tobacco, Yunnan Agricultural University

Kunming City, Yunnan Province

650201

Chen Yunquan, male, born in January 2004, Han ethnicity, from Kunming City, Yunnan Province, undergraduate.

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