Overview of Nature Education in National Parks

Youwen Zhang^{1, 2, a}, Xiaoyan Lv^{1, 2, b}

¹ School of Qinghai Normal University, Xining 810016, Qinghai, China;

² Qinghai Provincial Key Laboratory of Physical Geography and Environmental Process, Xining 810008, Qinghai, China.

^a1160602883@qq.com, ^b3260564269@qq.com

Abstract

National parks, as special nature reserves, play a key role in protecting ecosystems and serving as platforms for nature education. Since 2015, China has established 11 pilot parks, including Sanjiangyuan and Wuyishan, offering spaces for the public to learn about nature and develop environmental awareness. Nature education in national parks fosters understanding of ecosystems and promotes harmony between humans and nature. While international parks have more established practices, China's efforts in this field are still evolving, yet notable progress has been made. This paper reviews the development, key achievements, and future directions of nature education in national parks, providing insights for China's continued growth in this area.

Keywords

National parks; nature education; ecological protection; environmental awareness, harmony between humans and nature; sustainable development.

1. Introduction

National parks are special types of nature reserves designed to protect natural environments and ecosystems while also providing education and recreational opportunities to the public. These parks preserve rich natural and cultural resources, featuring complete ecosystems and biodiversity. National parks serve as vital platforms for nature education. Since 2015, China has established 11 pilot national parks, including Sanjiangyuan and Wuyishan, offering natural spaces for the public to learn about nature, acquire environmental skills, and develop ecological awareness. Nature education is one of the core functions of national parks, guiding people to understand natural environments and ecological processes, fostering respect and awareness for the environment, and promoting the harmonious coexistence of humans and nature. This aligns with the broader goals of sustainable development and the "lucid waters and lush mountains are invaluable assets" philosophy.

National parks abroad have a longer history and richer experience in nature education research and practice. However, China's research on national parks and nature education, which began later, is still in the exploratory stage. Theoretical frameworks suited to China's context are under development. Nevertheless, the experiences from international parks offer valuable insights into the advancement of nature education in China's national parks. As of April 2024, there were 1,572 published studies on nature education in China, but only 231 focused on the intersection of national parks and nature education. These include 141 journal articles and 67 dissertations. By reviewing the research on nature education in both domestic and international national parks, we can better understand the evolution of this field, the main research achievements, and the emerging trends. This provides a clear understanding of the field's development and offers a foundation for future research.

2. The Development of National Parks: A Global and Domestic Overview

2.1. The Development of National Parks Internationally

Australia: Australia is home to one of the world's oldest national parks, the Great Barrier Reef National Park, established in 1975. Covering an area of approximately 344,400 square kilometers, it is the world's largest coral reef ecosystem. The Australian government has actively protected and managed the park, ensuring the integrity of the ecosystem through development restrictions, water quality protections, and restoration efforts.

Canada: Canada boasts a vast number of national parks, the most famous being Banff National Park, established in 1885 in the Canadian Rockies. Canada has placed great importance on the protection and management of its national parks, establishing the Canadian Parks Service (CPS) in 1911. The government has ensured ecological safety and sustainable development of national parks through the creation of specialized protection agencies and the implementation of relevant laws and regulations.

United States: The United States is home to one of the most renowned national park systems in the world, including Yellowstone National Park and the Grand Canyon National Park. In 1832, American artist George Catlin first proposed the concept of a national park. To prevent private development, Congress established Hot Springs Reservation in Arkansas in the same year as the country's first nature reserve. In 1872, Congress passed the Yellowstone National Park Act, creating the world's first national park. In 1916, the National Park Service (NPS) was established to oversee these parks. The U.S. government has invested significant financial and human resources to ensure the ecological safety and sustainable management of national parks through dedicated agencies and legal frameworks.

Africa: Africa is home to some of the world's most abundant large wildlife populations, making national parks crucial for conservation efforts. Kenya's Maasai Mara National Park and Tanzania's Serengeti National Park are globally renowned wildlife conservation areas. African governments have strengthened the protection and management of national parks through specialized protection agencies and the enactment of relevant laws and regulations.

Lessons from International National Parks

1.Government Leadership: The development of national parks requires active government participation and support. Governments should formulate relevant laws and regulations, establish specialized protection agencies, and strengthen the management and protection of national parks.

2.Community Involvement: The protection and management of national parks necessitate the participation and support of local communities. Establishing community co-management mechanisms can enhance local residents' awareness of conservation and promote the sustainable development of national parks.

3.Scientific Monitoring: Strengthening scientific monitoring of national parks is essential for timely understanding of their ecological status and providing a scientific basis for protection and management.

4.Sustainable Tourism: Developing ecotourism can enhance the visibility and economic value of national parks while promoting environmental protection.

2.2. The Development of National Parks in China

A national park in China refers to a designated area, approved by the state, with the primary objective of protecting nationally representative natural ecosystems. These areas ensure the scientific protection and sustainable use of natural resources in specific land or sea areas. National parks are crucial for preserving China's natural ecosystems and biodiversity. Their

functions include protecting the authenticity and integrity of key natural ecosystems, as well as providing research, education, and recreation.

In recent years, China has actively promoted national park system trials, continuously refining its experiences and advancing the development of a national park system. As a key aspect of China's ecological civilization efforts, the development of national parks reflects the country's strong commitment to natural ecological protection. The development of China's national parks can be divided into three stages:

2.2.1. Exploration and Initial Stage (1950s–1980s)

In the 1950s, China began establishing nature reserves, marking the early implementation of the national park concept. In 1956, the Dinghu Mountain Nature Reserve was established in **Guangdong Province.**

In 1972, Taiwan promulgated the "National Park Law," the earliest national park law in China. In the 1980s, China joined the International Union for Conservation of Nature (IUCN), adopting international ecological protection concepts and techniques. Nature reserves gradually expanded, and Taiwan's Kenting National Park, the first national park in China, was established in 1984.

2.2.2. Rapid Development Stage (1990s-2010s)

In the 1990s, China implemented a series of ecological restoration projects, such as the Natural Forest Protection Project and the Grain for Green Project, further strengthening national park construction.

In the 2000s, China officially introduced the concept of national parks and began trials in select regions.

In the 2010s, China began fully promoting national park development. In November 2013, the concept of "establishing a national park system" was first proposed. In June 2015, China launched 10 national park system pilot projects across 12 provinces.

2.2.3. Deepening and Innovation Stage (2017–Present)

In 2017, China established the National Park Administration, which exercises unified management of natural resource assets and ecological protection within national parks. In September 2017, the "Overall Plan for Establishing a National Park System" was issued by the central government. In October 2017, the 19th National Congress report highlighted the need for a national park-based nature reserve system, emphasizing that "humans and nature are a community of life."

In 2018, China issued the "National Park Regulations," which clarified the definition, management structure, and protection measures of national parks, providing a legal foundation for their development.

On October 12, 2021, President Xi Jinping announced the establishment of China's first batch of national parks.

In June 2022, the National Forestry and Grassland Administration issued the "Interim Measures" for the Management of National Parks," providing guidance for the protection, development, and management of China's national parks during the transition before formal legislation is enacted.

3. The Development of Nature Education in National Parks

3.1. **International Development of Nature Education in National Parks**

National parks are vital for biodiversity conservation and the dissemination of ecological awareness, where nature education plays a crucial role. The concept of nature education traces back to Jean-Jacques Rousseau's naturalism during the Enlightenment, with Johann Heinrich

Pestalozzi transforming these theories into practical educational methods. Internationally, nature education in national parks has matured into a comprehensive educational system, encompassing ecotourism, environmental education, and nature interpretation. These activities aim to educate the public about environmental knowledge and awareness, while fostering environmentally responsible behavior.

United States: The U.S. national park system includes a vast array of nature reserves, national historic parks, and recreational areas. The National Environmental Policy Act (NEPA) was enacted in 1969, mandating the use of natural and social sciences to guide planning and decision-making. In 1970, the Environmental Education Act was passed, and the 2006 NPS Management Policies emphasized visitor experience and nature education. The U.S. National Park Service (NPS) considers nature education a core function of national parks, promoting environmental awareness and conservation through educational activities. The NPS collaborates with schools, communities, and civil organizations to further advance nature education.

Canada: Parks Canada, the Canadian national park administration, recognizes nature education as a fundamental mission of national parks. It has launched numerous educational projects and activities and conducted research to enhance environmental awareness among visitors. Canada has also developed online nature education platforms, providing abundant educational resources to the public.

Australia: Australia's Department of Environment and Energy places high importance on nature education, seeing it as a way to improve public environmental awareness and ecological literacy. Australia established its Ecotourism Association in 1990, issued the National Ecotourism Strategy in 1995, and included environmental education goals in the Adelaide Declaration of 1999. In 2000, the National Action Plan for Environmental Education for a Sustainable Future was enacted. Australian national parks promote nature education through diverse activities, the establishment of educational funds, and the development of nature education centers.

United Kingdom: Natural England, the agency responsible for national parks in the UK, promotes nature education for its potential to improve public health and environmental awareness. The 1995 Environment Act prioritized conservation, followed by the 1995 Education for the 21st Century and the 2004 National Park Act, which emphasized public understanding and appreciation of landscapes. In 2010, the New Forest National Park Management Plan (2010-2015) and the New Forest National Park Recreation and Management Strategy called for enhanced visitor experience and nature education. The UK promotes nature education through various educational activities, education stations, and instructional manuals to support national park education.

Insights and Recommendations:

1.Establish a comprehensive system for nature education and integrate it into national park development plans.

2.Strengthen the national park nature education workforce to improve education quality.

3.Innovate nature education methods by incorporating modern technology to enhance the educational experience.

4.Enhance international cooperation and learn from the successful experiences of other countries.

5.Foster collaboration with schools, communities, and civil organizations to further promote nature education in national parks.

3.2. Domestic Development of Nature Education in National Parks

Since the beginning of China's reform and opening-up period, significant progress has been made in the development of national parks. Throughout this process, nature education, an

integral function of national parks, has grown from non-existence to an increasingly established system. The development of nature education in China's national parks can be divided into three stages:

1.Initial Stage (1970s-1990s)

During this period, China's national park system was in its infancy, and nature education was still an emerging concept. In 1973, the first National Environmental Protection Conference emphasized the importance of scientific research and environmental education, marking the beginning of nature education in China. Environmental education was gradually integrated into primary and secondary school curricula, and early national parks began experimenting with educational activities such as guided tours and presentations on natural landscapes. However, the lack of professional training and resources limited the effectiveness of these activities.

2.Development Stage (2000s-2010s)

In the early 21st century, as the construction of national parks accelerated in China, the importance of nature education became increasingly recognized. In 2013, the State Council issued the National Tourism and Leisure Outline (2013–2020), which proposed the gradual implementation of study trips for primary and secondary school students. The government began investing in the professionalization and standardization of nature education, establishing dedicated nature education institutions and launching a series of projects such as "Green Schools" and "Ecotourism." Additionally, international concepts and methods, such as environmental and ecological education, were introduced.

3Maturation Stage (2010s-Present)

In recent years, China's nature education system has entered a stage of maturity. The 2010 publication of Last Child in the Woods introduced the concept of "nature-deficit disorder," raising awareness about children's mental and physical well-being and contributing to the rapid development of nature education in China. In 2014, the Ministry of Ecology and Environment launched the National Nature School Capacity Building Project, initiating pilot programs for nature education venues. The first National Nature Education Forum was held in Xiamen that same year, leading to a surge in nature education institutions. In 2019, the National Forestry and Grassland Administration issued a notice on fully utilizing the social functions of various protected areas to promote nature education, and the China Forestry Society released group standards for the construction of nature education bases in forested areas. In 2020, the National Focus on Forests event committee issued the National Three Hundred Million Young People Enter Forests for Educational Programs. In 2023, the National Long-Term Plan for Nature Education (2023–2035) was passed. The government has not only invested significantly in physical infrastructure, such as building dedicated nature education centers and science museums, but also made significant improvements in educational services, offering a wide range of nature education resources and activities. At the same time, nature education activities have diversified, encompassing ecological experiences, outdoor adventures, and scientific experiments.

4. Current Research on Nature Education in National Parks Domestically and Internationally

Nature education spans several disciplines, including geography, ecology, education, psychology, and sociology, due to its interdisciplinary nature. As a result, there is no universally agreed-upon definition of nature education, as it reflects different elements emphasized by various academic perspectives (see Table 1.). These differing viewpoints highlight the unique aspects each discipline considers essential in the concept of nature education.

Table 1 Representative concepts of Nature Education	
Source	Concept
National Nature Education	Education that is practiced in nature and advocates for a
Network	harmonious relationship between humans and nature.
National Forestry and	An educational process that relies on natural resources and
Grassland Administration's	integrates public characteristics. It sets educational goals to
"Guidelines for Nature	connect people with nature by providing facilities and
Education"	services that guide the public to approach, understand, and
	protect nature.
UNESCO Chair, Arjen Wals	Education that involves people of all ages, helping them
	understand and learn about nature, thereby fostering a
	harmonious coexistence with the environment.
Uzun F.V., Keles O.	Education that involves experiential learning about natural
	objects, phenomena, and processes in nature, with the goal
	of understanding, learning about, and respecting nature,
	thus fostering a mindset of caring for and protecting the
	environment.

Table 1 Depresentative Concents of Nature Educatic

4.1. National Parks as Representative Natural Areas for Nature Education

National parks are representative natural areas that boast rich biodiversity, unique geological features, and significant cultural heritage. In recent years, there has been increasing global attention on the protection and utilization of national parks, with nature education becoming a key component of park management. Many countries have incorporated nature education into their national park planning and management, achieving significant success in practice. By analyzing the current state of nature education research in international national parks, valuable insights and references can be provided for the development of nature education in China's national parks.

1. Theoretical Framework of Nature Education: Nature education in national parks should cover various aspects, including biodiversity, ecosystem services, and environmental protection. International scholars have deeply explored the theoretical foundations of nature education, including its definitions, objectives, principles, and methods, providing theoretical support for its practice. Both domestic and international scholars advocate for diverse educational methods such as lectures, demonstrations, experiential learning, and interactive activities to enhance educational effectiveness. Additionally, the use of modern technologies such as virtual reality and mobile applications can effectively increase the appeal of nature education.

2. The Role of National Parks in Nature Education: Research emphasizes the importance of national parks as venues for nature education, exploring how national parks can promote public understanding and awareness of nature through the provision of unique landscapes and ecosystems.

3.Impact Evaluation of Nature Education: International scholars have conducted assessments of nature education programs, evaluating their impact on public knowledge, attitudes, and behaviors, as well as their role in raising environmental awareness and encouraging participation in environmental protection activities.

4. Practical Examples of Nature Education: Numerous practical examples of nature education from international national parks have been widely studied. For instance, nature education in U.S. national parks emphasizes three dimensions: ecology, culture, and history. Through the establishment of educational courses and the implementation of interpretive programming, visitors are guided to better understand the natural and cultural characteristics of national parks. Australian national parks, on the other hand, advocate for an "active learning" model,

encouraging visitors to engage in field studies and outdoor activities, which enhances environmental awareness and fosters a sense of responsibility for protecting the natural environment.

5.Nature Education and Community Participation: International studies also focus on how nature education can promote community participation and partnerships. Research shows that involving local communities in nature education enhances the effectiveness of educational programs.

6.Interdisciplinary Research: Research on nature education often spans multiple disciplines, including ecology, education, psychology, and sociology. This interdisciplinary approach provides a broader perspective on understanding and improving nature education.

7.Sustainable Development Perspective: International scholars emphasize the concept of sustainable development in their research on nature education. They explore how nature education can contribute to the sustainable use and management of ecological environments.

Current Research on Nature Education in Chinese National Parks 4.2.

A keyword co-occurrence analysis of Chinese literature on nature education in national parks (Fig. 1.) reveals that "nature reserve," "nature education," and "national park" are the three most frequently mentioned terms. These terms play a central role in the context of nature education in national parks. Additionally, keywords such as "forest park," "wildlife protection areas," "scenic spots," and "forest parks" also appear frequently, indicating that much of the research on nature education is conducted within these areas. National parks serve as the core keyword, linked to various other keywords, signifying their critical role in nature education. Keywords like "nature reserve" and "scenic spots" also demonstrate strong connections with national parks, reflecting their significant role in nature education. However, terms like "forest parks" and "rural revitalization" show relatively weaker relationships with national parks, indicating different focuses and strategies.



Fig. 1 Analysis of keyword co-occurrence in Chinese literature on nature education in national parks

The research and practice of nature education in national parks within China is a relatively new field. However, in recent years, it has gradually become a focal point of academic interest. The

following are some of the research progress and viewpoints from Chinese scholars regarding nature education in national parks:

Definition and Importance of Nature Education: Chinese scholars have explored the concept of nature education, emphasizing its role in enhancing public awareness of nature, fostering environmental consciousness, and promoting ecological balance. The unique importance of national parks as ideal venues for nature education is increasingly being recognized. For instance, studies such as "Types and Characteristics of Tourism Products in Chinese Nature Reserves" by Xie Yefeng and Wu Bihu (2021) have highlighted this significance.

Pathways to Enhance the Functions of Nature Education: Some studies suggest that the functions of nature education in national parks can be enhanced through various means, such as strengthening infrastructure, providing professional interpretative services, conducting diverse educational activities, refining management systems, and increasing public participation. Examples include "Research on the Education Function of Urban Green Spaces in China" by Zhang Yuan (2010).

Relationship Between Nature Education and Ecological Protection: Scholars have pointed out that nature education not only helps improve public environmental awareness but is also an integral part of ecological protection efforts in national parks. By promoting understanding and respect for ecosystems, nature education contributes significantly to nature conservation and sustainable development. For example, the study "Nature Education Contributing to the High-Quality Development of Ecotourism" by Mo Huachao (2020) explores this relationship.

Learning from International Experience: Chinese scholars often refer to successful international examples, such as the nature education programs in the United States, Australia, and other countries, to draw insights for China's national parks. Notable references include "Summarizing International Developments in Environmental Education" by Zhu Huaixin (1994), "Tracing International Trends in Environmental Education" by Li Jiusheng (2004), and "The Influence of Mainstream International Environmental Education on China" by Li Qing (2004).

Planning and Implementation of Nature Education: Research also focuses on planning frameworks and implementation strategies for nature education in national parks, including how to integrate resources, design educational programs, and establish effective management mechanisms. Examples include "Historical and Future Trends Analysis of Environmental Education Research in China" by Tian Qing (2007) and "Planning and Designing Environmental Education Systems in Forest Parks" by Sun Ruilin (2013).

Public Participation and Evaluation of Educational Effectiveness: Scholars have also examined how to assess the effectiveness of nature education in national parks and how to enhance public participation and the efficiency of educational activities. Examples include empirical studies such as "Evaluation of Ecotourism Environmental Education Effectiveness" by Li Wenning (2012) and "An Analysis of the Development of Nature Education in Fuzhou National Forest Park Based on Visitor Perceptions" by Wang Biyun (2016).

Use of Interdisciplinary Research Methods: Research on nature education in national parks often requires interdisciplinary collaboration, involving experts from ecology, education, psychology, sociology, and other fields to produce comprehensive and in-depth research outcomes.

The development of nature education in China's national parks has evolved from nothing, gradually gaining strength. During this process, government support and investment have played crucial roles. Moving forward, as the construction of national parks in China continues, nature education will play an increasingly important role in protecting the environment, enhancing public environmental awareness, and promoting sustainable development. Despite the nascent stage of domestic research in this field, more scholars and practitioners are

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beginning to explore this area, contributing to China's environmental protection and sustainable development. As the national park system is further improved and the concept of nature education becomes more widespread, research and practice in this field are expected to advance and expand further.

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