

Article

National Forest Parks in China: Origin, Evolution, and Sustainable Development

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Abstract: The concept of National Forest Park (NFP) is mainly used in mainland China. Originating in 1982, NFP embodies a “top-down” concept and associated program launched by the Chinese government. It is aimed at promoting forest-based tourism and economic development under the premise of protecting forest resources. After 30 years of development, NFPs have made great achievements in protecting specific forest resources, promoting forest-based tourists, promoting regional economic development, and they have gained popularity worldwide. However, due to the fast pace of NFP expansion, lack of predictable planning and innovative thinking, and ineffective governance, some problems like overexploitation, scenic pollution, monotonous development patterns, and ecological degradation associated with NFP constrain its sustainable development. In order to solve these problems effectively, a holistic review of the status of NFPs in China is needed. To help meet this need, the origin, evolution, and current status of NFPs in China were analyzed. The presented research also included retrospective analyses of challenges and opportunities for NFPs sustainable development in China. Results show that from 1982 to 2015, the number of NFPs grew dramatically, and this development occurred in four phases. In addition, NFP development has been unbalanced in regional distribution. When analyzing the evolution of NFPs, the main issues to date have included failure to implement Master Plans in practice, unclear supervisory responsibilities, ambiguous classification, unbalanced distribution, destruction of natural resource and ecosystems, insufficient cultural protection, weak awareness of nature education, lack of resource statistics, monotonous planning, and weak marketing. Study findings can contribute to promoting the sustainable future development of NFPs and support the forest-based tourism industry.

Keywords: conservation planning; forest-based tourism; forest governance; national parks

1. Introduction

According to Food and Agriculture Organization of the United Nations (FAO) statistics, the world’s forests cover one-third of the global land area. Various empirical studies have shown that forests play a vital role for societal and economic well-being, whether by offering food and wood in ancient times, or by creating income and employment, and providing environmental services such as water and soil conservation, biodiversity conservation, and climate mitigation [1–5]. Since the 1960s,

countries around the world have begun to attach greater importance to forest conservation [6]. As a result, various types of protected areas have been established to protect the forest environments. In some cases, this has been combined with developing tourism.

Dating back to the early 19th century, the United States was the first country to develop a forest-based tourism industry. Yellowstone National Park was established as the first national park, with the aim to incorporate tourism and leisure functions into the natural area, but with its conservation being the first priority [6,7]. National parks such as Yellowstone not only protected many of the country's best-known natural sites, but also generated major revenues for organizations such as the National Park Service [8]. Subsequently, forest-based tourism became widely spread among developed countries such as Canada, the United Kingdom, Germany, the Scandinavian countries, Australia, and New Zealand, but also developing countries like China, Thailand, and Malaysia [6,9–13]. As pointed out by UN Secretary-General Ban Ki-moon when he visited the World Tourism Organization in 2007, tourism has proven to be a major way to increase the participation of developing countries in the global economy, and forest-based tourism is an essential component of this [14].

Different from the other countries, China has valuable forest resources (about 22.19% of the national area and forest area ranking fifth in the world) [1] but has still been a late adopter of forest protection policies. Establishing National Forest Parks (NFPs) throughout the country has been one of the relevant policies. Almost 100 years after Yellowstone National Park in the USA and Banff National Park in Canada, NFPs originated in 1980 as one of the earliest and most influential nature reserve sites in China [15]. Gradually a network of NFP was established, synchronously with Provincial Forest Parks and Municipal/County Forest Parks. NFPs constitute the highest level in China's forest park system. Their role in strengthening the protection of forest resources, popularizing natural science knowledge, and promoting economic development has become increasingly prominent [16,17]. The importance of NFPs has been affirmed at all levels of government and the community [15]. The 30 years of development has seen a steady growth in NFPs. By 2015, China (with the exclusion of Hong Kong, Macao, and Taiwan) had already established 827 NFPs, with their total area reaching 12,510,601.77 ha (National Forestry and Grassland Administration, 2015). Some of the NFPs are well known because of their landscape qualities, culture heritage, and favorable eco-environment. However, there is room for improvement and thus research can inform the further enhancement of the NFP system.

To date, only few studies [18–21] have looked into the overall development of NFPs in China. The lack of research can pose a barrier for the sustainable future development of NFPs. Without support of sound development, innovative marketing, effective governance, and understanding of the benefits of NFPs, improvements to the system will be difficult. Numerous NFPs are suffering various problems such as overexploitation, scenic pollution [18,22–25], monotonous development patterns [20,21,23], and ecological degradation [25–27]. The present research seeks to analyze the origin, evolution, and current situation of China's NFPs, and to identify the opportunities and challenges related to the sustainable development of the NFPs. The study takes a comprehensive perspective, studying NFP development at the macroscale.

2. Methodology

The framework for the study of the overall development of NFPs in China is shown in Figure 1.

Data about the approved number of NFPs, their geographical distribution, management condition, and the different categories of NFPs in the period from 1982 to 2015 were obtained from the official website of National Forestry and Grassland Administration (NFGA) (<http://www.forestry.gov.cn/>). Relevant planning documents were acquired from NFGA.

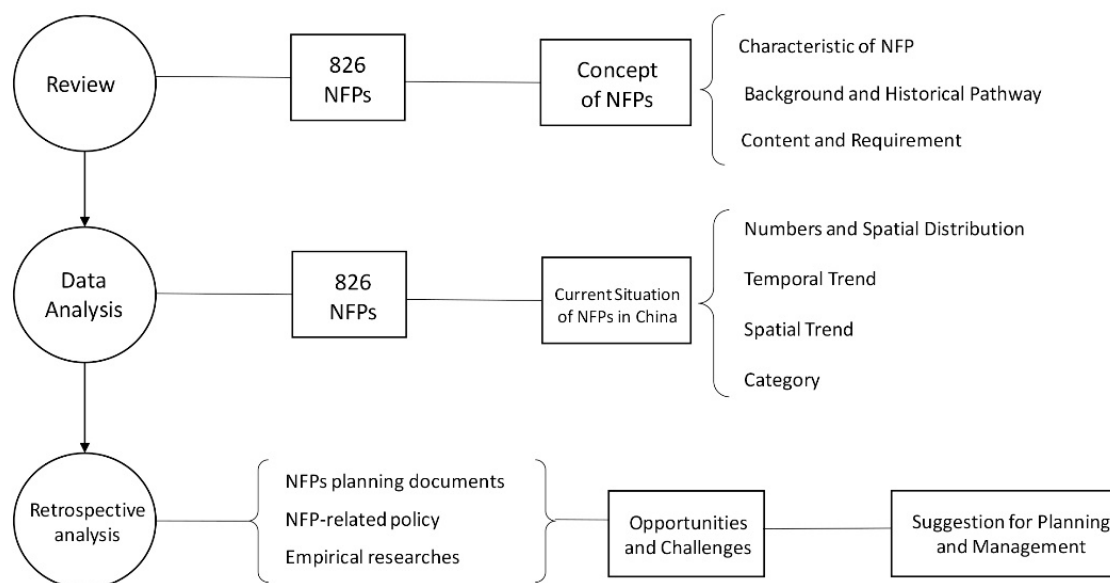


Figure 1. Framework for the study of National Forest Parks (NFPs) in China (Designed and Drawn by the first author).

2.1. Concept and Characteristics of NFPs

When analyzing the NFP concept, identifying NFP characteristics and background is necessary as there are various definitions of NFPs. According to the definition in the *Master Planning of National Forest Parks (LY/T2005-2012)* promulgated by NFGA, an NFP is a natural area supported by forest resources with a stable ecological environment, which contains natural resources of national significance or special protection value, with certain scale and tourism development conditions, and most importantly which should be approved by the forestry administrative department of the State Council [28]. The essence of NFPs can be summed up according to three aspects: (1) protecting forest landscape resources and biodiversity, (2) supporting the development of forest-based tourism, and (3) promoting the dissemination of ecological culture, according to *Measures for the Administration of National Forest Parks* (official document published by NFGA).

2.2. Development Stages and Requirement Analysis

To further distinguish the scope of NFPs, an exemplification of the background and historic pathway of NFPs is important as this will enable further understanding of their development and enhance their improvement. This study analyzed the management and policies developed by national and local governments, as well as findings from empirical studies and expert opinions. Based on this, four stages can be distinguished in the development of NFPs: (1) the start-up stage (1980–1990), (2) the expansion stage (1991–2000), (3) the standardization stage (2001–2010), and (4) the mature stage (since 2011). Not until the mature stage did the NFGA issue relevant documents such as the *National Forest Park Management Measures* and the *National Forest Park Master Plan* to regulate the management of NFPs. These documents defined the content and requirements for enhancing the creation of NFPs. All these documents were further utilized to identify the opportunities and challenges of NFPs.

2.3. Current Situation

In order to analyze the current situation of NFPs in China, the number and spatial distribution such as the distribution in 31 provinces and 7 regions of NFPs by the end of 2015. The region divisions are based on the conventional Chinese geographical division, all NFPs were distributed into 7 regions [29]. Also, the NFPs' temporal variation, spatial variation, and the different categories of

NFPs were studied. This research reviewed the temporal and spatial variation trend of all 826 NFPs in China during 1982–2015 to illustrate their evolution and current situation.

2.4. Contributions and Problems Associated with the Development of NFPs

In addition, this research collected the overall planning documents for 827 NFPs and all NFP-related policy in China. Moreover, previous studies were compiled to analyze the contributions, challenges and problems associated with NFPs. This can help with identifying advantages of NFPs as well as barriers, and thus inform future development.

3. Results

The 826 NFPs' geographical distribution, management condition, planning document and the different categories of NFPs in the period from 1982 to 2015 were obtained. Also, the relevant state administrative regulations, major event report of NFPs were collected.

3.1. Concept and Characteristics of NFPs

The NFP concept is mainly used in mainland China. It is one category of China's National Park system and represents the earliest and the most common type of National Parks in China (Figure 2). Different from other national parks, such as National Nature Reserve and National Wetland Park, the NFP concept was initially adopted for tourism and leisure purpose. [30]. Moreover, it represents a “top-down” program initiated by the government of China for promoting forest-based tourism while also bringing economic benefits [18]. As mentioned earlier, the Forest Park system in China is divided into three levels: National Forest Park, Provincial Forest Park, and City or County Forest Park. Among these, NFP is the highest level and refers to particularly beautiful forest landscapes, with also important cultural landscape qualities and high ornamental, scientific, and cultural values, a special geographical location, representing a certain land area, good tourist service facilities, and a higher “visibility” as compared to other areas. What's more, NFPs can be used by people to visit, rest or conduct scientific, cultural and educational activities. The most important characteristic is that NFP status can only be granted by the NFGA.



Figure 2. The position of NFPs in China's National Park system. (Information collected from the document of National park management system).

NFPs are a multipurpose construct, and the essence of the NFP concept comprises three major aspects. Firstly, protecting forest landscape resources and biodiversity is in focus. The establishment of NFPs has become an important part of the nature reserve system in China since it has effectively protected a large number of precious natural biology resources. Among all NFPs, 13 have been listed as World Heritage Sites, and 14 have been included in the Global Geological Park Network (NFGA,

2015). For the purpose of further strengthening important Forest Scenic Resource protection, the NFGA produced a catalogue about national important forest landscape resources in 2006. Not until 2012, NFGA released the *Guideline for Master Planning of National Forest Park* (GMPNFP), which puts forward special protection and cultivation requirements for important forest resources and assigns related resources to core landscape area management. Combined, these two guiding documents clarify the specific classification of forest landscape resources, which are divided into 5 categories and 25 sub-categories (as shown in Table 1).

Table 1. Classification of Forest Landscape Resources (Information acquired from the NFGA).

Categories	Sub-Categories
Biological Landscape	Forest Landscape
	Brushwood Landscape
	Herbaceous Landscape
	Rare plant Landscape
	Animal Resources Landscape
	Cultivated Vegetation Landscape
Physiographic Landscape	Structural Landform
	Rock Landscape
	Gravity Landform
	Fluvial Landform
	Karst Landform
	Lacustrine Landform
	Aeolian Landform
Hydrological landscape	Artificial Landscape
	Water Landscape
	River Landscape
	Deep Pools Waterfall Landscape
	Lake Landscape
	Marsh Landscape
Astronomical landscape	Snow Landscape
	Brillouin Scattering (light phenomenon)
Humanistic Landscape	Weather and Climate Phenomena
	Construction
	Historical Site
	Regional Custom

Secondly, supporting the development of forest-based tourism is a key dimension of NFPs. The most important effect of establishing NFPs was promoting the development of forest-based tourism while bringing economic benefits. Most of NFPs are located in mountainous areas with a relatively undeveloped economy, and thus the forest-based tourism development often brings opportunity and development. The establishment of NFP shifted economic activities from cutting trees, selling hills, and forest products to forest sightseeing and tourism, thus introducing urban residents to ecological values in more remote areas. Many poverty-stricken regions have gained significant economic benefits through the construction of NFPs. For example, since the establishment of Zhangjiajie National Forest Park in Hunan province, the annual amount of tourist has increased from 80,000 to 520,000, and tourism revenue multiplied 16 times compared to the beginning (a period of only 6 years) (NFGA, 2015).

Thirdly, NFPs aim to promote the dissemination of a more ecological culture. NFPs are an ideal place to transfer knowledge about the natural world and spread the Chinese concept of ecological civilization like the ancient application of forestry theories in protection processes. This function has also been highly valued by the government. It was reflected, for example, in the GMPNFP adopted in 2012, which incorporates “ecological culture construction” as an independent chapter into the overall planning scope of NFPs. Moreover, NFPs set an example for building “ecological culture” and raising national awareness of ecological protection. NFPs also provide a setting for research and experiments, a creative basis for artists, and venues for patriotic education. In recent years the NFGA has promoted the idea of forest eco-experiences. NFPs throughout the country successively launched various eco-culture activities and augmented the construction of “eco-culture” infrastructure. For instance, Gansu and Beijing have cooperated with Germany and South Korea to build “forest experience centers”; Zhejiang province has launched a series of forest park parent-child activities; and Hunan province set up an eco-cultural project named “Hidden Culture in the Mountain” [31].

3.2. Background and Historical Pathway

Considering that the establishment of NFP has the advantage of enhancing landscape scenery, rich cultural connotations, scientific popularization, and providing substantial economic benefits, it has emerged as a best practice for promoting forest conservation in a comprehensive manner. According to the management and guidance by national and local governments, and also referring to empirical research, the present research identified four stages of NFP development: the start-up stage (1980–1990), the expansion stage (1991–2000), the standardization stage (2001–2010), and the mature stage (Since 2011; as shown in Figure 3.).

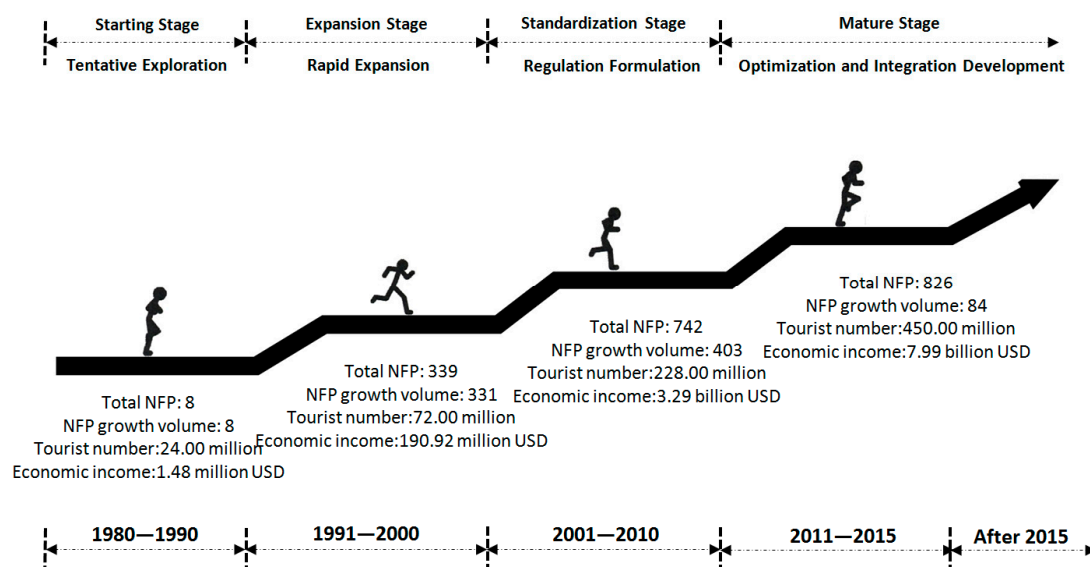


Figure 3. The development stages of the NFPs in China. (Information obtained from National Forestry and Grassland Administration (NFGA): <http://www.forestry.gov.cn/>, drawing designed and drawn by the first author.).

3.2.1. Start-Up Stage (1980–1990): Tentative Exploration

The original purpose of the development of China’s NFP program was derived from the development of forest tourism. An important milestone for this was the “Huangshan Speech” by Secretary General Xiaoping Deng in 1979. This address pointed out the potential of China’s tourism industry. In order to respond to this call, the Ministry of Forestry (former name of NFGA) issued a document named “Notice on Protecting Forests and Developing Tourism in State-owned Forest Farms as Scenic Spots” in 1980. As a result, top-down project under the term NFPs was launched.

Subsequently, the first NFP was established in 1982 in Zhangjiajie, Hunan Province. This was the start of the establishment of NFPs in state forests.

However, due to insufficient understanding of the role of forest tourism and the economic benefits state forests could receive, the speed of NFP development initially was slow. Between 1980 and 1990, only 8 NFPs were established nationwide, respectively located in Liaoning Province, Jilin Province, Jiangsu Province, Zhejiang Province, Anhui Province, Henan Province, Hunan Province, and Guangdong Province (mainly located in southeast). In addition, corresponding management and administration were weak during this phase, and specialized management organizations were not yet established.

3.2.2. Expansion Stage (1991–2000): Rapid Expansion

Due to the role of strong national policy, the number of NFPs soared during this phase. There were four main reasons for this rapid growth. First of all, NFPs became fully recognized by society after experiences gained in the start-up phase. Second, with the two crises forestry faced (a resource crisis and a revenue crisis), there was a need for immediate adjustment of the industrial structure of sole focus on timber production in forestry. Thirdly, people's participation in forest-based tourism has greatly promoted the economic growth of NFPs. Statistics showed an astonishing growth in the number of tourists and in forest tourism income since the first NFP had been established. This strengthened the confidence and determination of the government to implement the NFP program. Last but not least, further promotion of the national policy played an important role. At the Forest Park and Forest Tourism Working Conference held in Dalian in 1992, the Department of Forestry announced that NFPs should be established in state-owned forest farms with beautiful forest environments, rich in biological resources, and endowed with natural and cultural landscape. Since then, the construction speed of NFP has obviously accelerated, with the number of NFPs reaching 339 by the end of the year 2000 (NFGA, 2000).

Meanwhile, for the sake of regulation, industry guidance, and management, the Forest Park management office was incorporated in 1992. This was followed by the lower levels (provinces, cities, districts) also setting up regulatory agencies. In early 1994, the NFGA adopted the Measures for the Management of Forest Parks. In December of 1994, the China Forest Landscape Resources Evaluation Committee was established, which standardized the approval procedures for NFPs and formulated the evaluation criteria for the quality of forest park landscape resources. Until November 1999, the National Technical Supervision Bureau officially promulgated the *National Standard for the Quality Assessment of Scenic Resources of China Forest Park* (GB/T18005-1999). These initiatives, standards, and guidelines gradually improved the establishment and management of NFPs.

Consistent with the expansion of NFPs, forest-based tourism income also increased rapidly. In 2000, the number of NFP visitors had reached 72 million, and direct income of NFPs reached 1292 million yuan (190.92 million USD). In all, 15 NFPs, such as Zhangjiajie in Hunan and Lafa Mountain in Jilin, had a revenue of more than 10 million yuan, which turned the NFPs into a local leading industry. However, such rapid expansion directly led to lagging construction quality and devastating effects on forest ecosystems, which strongly constrained the future development of the NFPs. All of these features became important characteristics of the NFPs' evolution at this stage.

3.2.3. Standardization Stage (2001–2010): Regulation Formulation

After experiencing the astonishing expansion of NFPs during the previous stage, public awareness of ecological protection of forests has continuously increased. In order to promote the sustainable development of NFPs, the government has shifted the management focus from quantitative construction of NFPs to a focus on quality development. In this stage, the upper management department issued a number of relevant policy documents to strengthen the ecological protection and ecological culture promotion of NFPs. All these documents include clear requirements for the construction of NFPs and forest-based tourism. These include the Decision of the *Central Committee of*

the Communist Party of China on Accelerating Forestry Development (2003), which required that by 2010, the soil erosion in the river basin and desertification in the main sandstorm areas will be alleviated, and the overall deterioration of the national ecological situation will be initially contained, by 2020, the ecological problems in key areas will be basically solved, and the ecological situation in the country will be significantly improved, and by 2050, the mountains and rivers will be beautifully realized, and the ecological conditions will enter a virtuous circle. The Notice on Further Strengthening the Construction of Ecological Culture in NFP (2007), which required to incorporate the contents of ecological culture construction into the overall planning of NFPs, strengthen the construction of ecological and cultural infrastructures such as forest parks (natural) museums, popular science education bases, publicity science popularization cards, regulate commentary words to improve the scientific, educational nature of the guide, name a batch of national ecology bases in 2007 and placing in priority list. The Opinion of the Central Committee of the Communist Party of China and the State Council on Promoting the Reform of Collective Forest Tenure (2008), which required to use 5 years to complete the reform task of clarifying property rights and contracting households, and through deepening reforms, improving policies and services, standardizing management, gradually form a benign development mechanism for collective forestry, and achieve the goal of resource growth, increasing farmers' income, good ecology, and harmonious forest areas. The State Council's Opinion on Accelerating the Development of Tourism (2009), which required cultivation of new tourism consumption hotspots, promotes the integration of forest-based tourism and related culture, and increases regional development funds to support the development of eco-tourism and forest-based tourism (NFGA, 2014). The release from multi-party management by a series of varying norm documents means that the development of NFPs entered a standardization stage.

3.2.4. Mature Stage (Since 2011): Optimization and Integration Development

The year 2011 was a transition year for the NFP program, as the development of NFPs entered a "new-normal" stage. The Forest Park Protection and Development Center of NFGA was established and subsequently it issued the *National Forest Park Management Measures* as a special regulation for national forest management which effectively strengthened the ability of industry management.

At this time, the management of the NFP system was actively in line with the management of the International Nature Conservation System, especially with regards aspects of policy, legal system construction, planning and standardization construction, and personnel training. As a result, Jilin Longwanqun National Forest Park was selected as the first NFP on the "green list" of the best managed conservation sites in the world by the International Union for Conservation of Nature (IUCN) [32]. Meanwhile, the NFGA hosted several international forums such as the First China National Forest Park International Forum, the First Cross-Strait Forest Park and Forest-based Tourism Forum, the First Cross-Strait forestry Forum, and the Asian Commentary Seminar (NFGA, 2015). These initiatives greatly promoting the interactive and cooperation of NFP system with foreign countries.

Moreover, the NFGA proposed a multi-party integration plan for forming a structure with NFPs as the core components, supplemented by Wetland Parks and Nature Reserves. In addition, the establishment of a Chinese national park system management proposed in 2016 also provides a special opportunity for the sustainable development of NFPs. Overall, during this period, the development of NFPs entered a mature stage, with its main focus on the optimization and integration of the NFP system. The work in this ongoing stage requires extensive research to support future NFP development.

3.3. Contents and Requirements

In order to regulate the construction of NFPs, the NFGA adopted the GMPNFP as a unified standard in 2012. The document stipulated that the NFPs established after 2012 should follow by the requirement in the GMPNFP, while those NFPs set up before 2012 should supply corresponding documents according to their own circumstances. The present research summarizes the requirements and contents to illustrate the current holistic concept of NFPs in China.

On the basis of the GMPNFP, the NFP creation process should focus on nine items:

1. Resource investigation and status analysis
2. Construction scope, character and objectives
3. Functional division
4. Capacity prediction
5. Market forecasting
6. Development strategy, theme orientation and marketing plan
7. Specialized planning
8. Phased construction planning
9. Investment-benefit analysis

The 7th item—Specialized planning—can be further divided into seven sub-items, including Conservation, Forest Landscape, Construction of Ecological Culture, Forest-based Ecotourism and Service Facilities, Foundation Engineering, Land Use, and Community Development. All these items and sub-items are considered the planning requirements of NFPs and are presented in Table 2.

Although the purpose of establishing NFPs was promoting the development of forest-based tourism, tourist and leisure functions cannot be at the expense of the environment, the forest landscape, cultural relics, and the like. In general, NFP development should be carried out in conjunction with ecological protection.

Table 2. Planning items and requirements for NFPs (Information collected from the document of Guideline for Master Planning of National Forest Park (GMPNFP)).

Item	Requirement
Resource Investigation and Status Analysis	<ul style="list-style-type: none"> ➤ Comprehensively collect survey data on topography, natural resources, socio-economics, land and environment, infrastructure, and forest landscape resources; ➤ Evaluate forest landscape resources and ecological environment resources; ➤ Analyze advantages, weaknesses, planning strategies, and planning priorities; ➤ Analyze main development directions and tourism products.
Construction Scope, Character and Objectives	<ul style="list-style-type: none"> ➤ Identify the scope of establishment and coordinate control area; ➤ Identify the properties based on typical characteristics and main functions; ➤ Define goals and stage objectives based on property, social needs, and planning duration.
Functional	<ul style="list-style-type: none"> ➤ Subareas should objectively reflect the resource characteristics of different areas of the forest park, which is conducive to the organization of the activities and the long-term development of the park; ➤ Categories should include core landscape area, recreation area, management service area and ecological conservation area; each category can be further divided into scenic spots according to specific conditions.
Capacity Prediction	<ul style="list-style-type: none"> ➤ Including ecological capacity, tourist capacity, and population capacity.
Market Forecasting	<ul style="list-style-type: none"> ➤ Tourism market is generally divided into domestic and inbound tourism market, and can also be divided by geographical area, tourist groups, and travel modes; ➤ The forecast could base on the level of tourism resources, popularity, market promotion, traffic accessibility, and proximity to similar forest parks or tourists.
Development Strategy, Theme Orientation, and Marketing Plan	<ul style="list-style-type: none"> ➤ Development strategy based on development status, location conditions, and resource advantages; ➤ theme orientation and marketing plan could be defined by landscape resources, location, products, services, cultural background, and public awareness of NFPs.

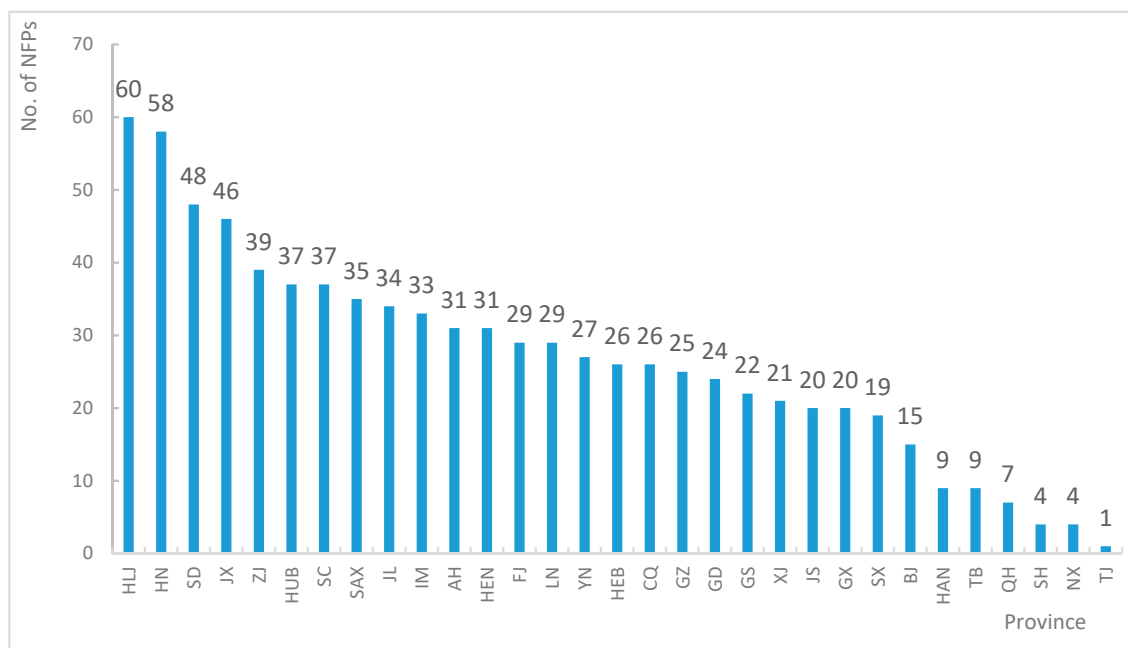
Table 2. Cont.

Item	Requirement
Specialized Planning	<div>Conservation</div> <ul style="list-style-type: none"> ➤ Including important Forest Scenic Resource Protection, protection of biological resources, environmental protection, disaster prevention and control; ➤ The key protection objects of the forest park should be clarified, the scope of protection should be determined, protective measures should be formulated, and protection facilities should be planned.
	<div>Forest Landscape</div> <ul style="list-style-type: none"> ➤ Give priority to protecting the natural state of local forest vegetation; ➤ Landscape forest and recreational forest can be established in wasteland suitable for planting trees; ➤ Reconstruction of single forests and plantations with forests to enhance landscape effects and health functions.
	<div>Construction of Ecological Culture</div> <ul style="list-style-type: none"> ➤ In-depth study of resources features is required to clarify their important role in protecting ecological security of the region; ➤ Developing the cultural construction of forest parks under the premise of taking into account ecology.
	<div>Forest-based Ecotourism and Service Facilities</div> <ul style="list-style-type: none"> ➤ Including analysis of forest landscape resources characteristics, recreation project organization, recreation area organization, tour organization, and tour arrangement; ➤ Services include catering, accommodation, entertainment, shopping, leisure, and medical facilities.
	<div>Foundation Engineering</div> <ul style="list-style-type: none"> ➤ Including road traffic, power supply, water supply and drainage, communications networks, according to actual needs; can also be heating, radio and television, gas and other project planning; ➤ Roads, water, electricity, telecommunications, gas and other line layout shall not damage the landscape and meet the requirements of safety, hygiene, economy, also ease for maintenance; ➤ As much as possible connect with towns, something which has been shown to be difficult; can be self-contained or part of networking, and networking to create conditions for the future.
	<div>Land Use</div> <ul style="list-style-type: none"> ➤ Containing land resource assessment, land use status and balance sheet, land use planning and balance sheet.
	<div>Community Development</div> <ul style="list-style-type: none"> ➤ Whenever there are settlements in forest parks, community development plans should be prepared; ➤ Should include the status, characteristics and trend analysis, the scale of development and distribution of the population; business management and social organizations, residential nature, functions, motivation characteristics and distribution, land use planning and direction, content industry and workforce development planning.
Phased Construction Planning	<ul style="list-style-type: none"> ➤ Including short-term planning (within 5 years), medium-term planning (6–10 years), and long-term planning (more than 10 years); should focus on short-term planning.
Investment–Benefit Analysis	<ul style="list-style-type: none"> ➤ According to different engineering categories including protection, plant landscape, foundation, scenic spot construction, and service facility, the phased investment estimate is based on the construction sequence and the financing method is proposed; ➤ Benefits should be comprehensively evaluated in terms of three aspects: ecological benefits, social benefits and economic benefits.

3.4. Current Situation of NFPs in China

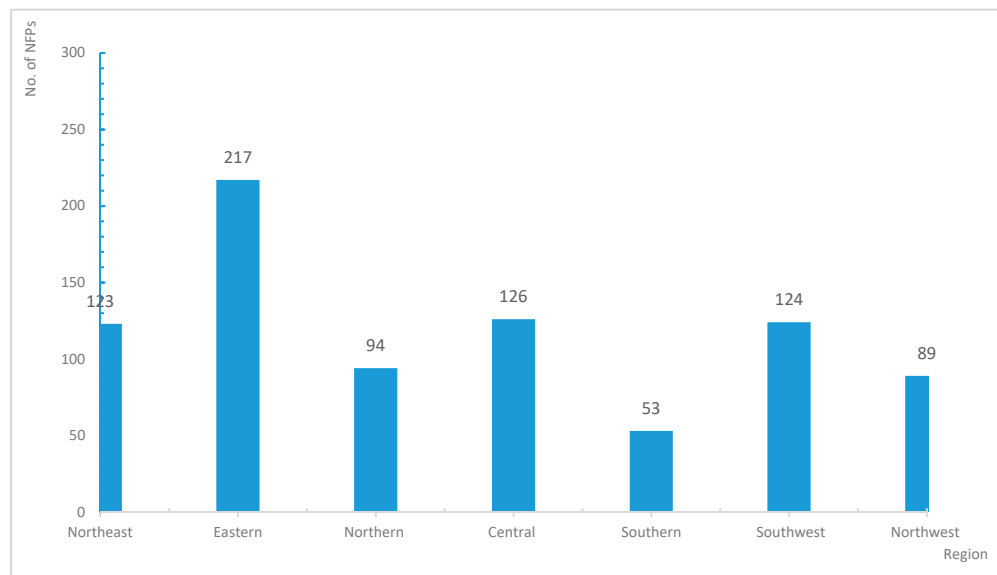
3.4.1. Number and Spatial Distribution

In terms of quantity, the distribution of NFPs in 31 Chinese provinces and 7 regions is unbalanced. As Figure 4 shows, Heilongjiang holds the largest number of NFPs, with a total of 60 (accounting for 7.26% of the total number) due to its rich biodiversity. Tianjin has the lowest number of NFP, only one (i.e., about 0.12% of the total). This is because that Tianjin is listed as a municipality city, and the area occupied by this region is smaller than other provinces. Additionally, owing to a higher forest proportion, abundant natural resources, large population, good economic development, and higher demand, there are 12 provinces with more than 30 NFPs. Ranked by number these were: Heilongjiang, Hunan, Shandong, Jiangxi, Zhejiang, Hubei, Sichuan, Shanxi, Jilin, Inner Mongolia, Anhui, and Henan. The provinces that contained less than 10 NFPs were: Hainan, Tibet, Qinghai, Shanghai, Ningxia, and Tianjin. Their lower numbers can be explained by the provinces' small area of jurisdiction, poor economy, harsh environment, high construction difficulties, and low demand for forest tourism opportunities. The Figure 5 shows while the eastern region holds the most NFPs, the southern region holds the least. This can be attributed to a higher economic level, richer resources and greater demand in the eastern region.



HLJ: Heilongjiang; HN: Henan; SD: Shandong; JX: Jiangxi; ZJ: Zhejiang; HUB: Hubei; SC: Sichuan; SAX: Shanxi; JL: Jilin; IM: Inner Mongolia; AH: Anhui; HEN: Henan; FJ: Fujian; LN: Liaoning; YN: Yunnan; HEB: Hebei; CQ: Chongqing; GZ: Guizhou; GD: Guangdong; GS: Gansu; XJ: Xinjiang; JS: Jiangsu; GX: Guangxi; SX: Shanxi; BJ: Beijing; HAN: Hainan; TB: Tibet; QH: Qinghai; SH: Shanghai; NX: Ningxia; TJ: Tianjin.

Figure 4. The number of NFPs in 31 provinces (status by the end of 2015). (Information collected from the official website of NFGA (<http://www.forestry.gov.cn/>)).



Northeast regions (HLJ, JL, LN), eastern regions (SH, JS, ZJ, AH, FJ, JX, SD), northern regions (BJ, TJ, SAX, HB, IM), central regions (HEN, HB, HN), southern regions (GD, GX, HAN), southwest regions (CQ, SC, GZ, YN, TB), and northwest regions (SX, GS, QH, NX, XJ).

Figure 5. The number of NFPs in 7 regions (status by the end of 2015). (Information collected from the official website of NFGA (<http://www.forestry.gov.cn/>)).

3.4.2. Temporal Variation

Since the NFGA established the first NFP, new NFPs have been established every year. The growth trend of NFPs was remarkable from 1982 to 2015, as shown in Figure 6. Overall, it shows a growth trend from slow to fast then finally turn to mild. As mentioned before, the development of NFPs in the first stage (1982–1990) was the lowest. In contrast, the number of NFPs in the period from 1991–2000 (expansion stage) grew fastest. Especially in the year 1991, the annual increase had reached 136. After substantial NFP growth during the first three stages, upper decision maker became aware of the risks associated with rapid development. For better promoting the sustainability of NFPs, the government has shifted the management focus from quantity to quality. The number of National Forest Park during the mature stage grew only by 84. Additionally, the annually approved NFPs also presented a trend of periodic growth, with mean numbers of 0.78 (1982–1990), 32.2 (1991–2000), 36.7 (2001–2010), and 16.8 (2011–2015).

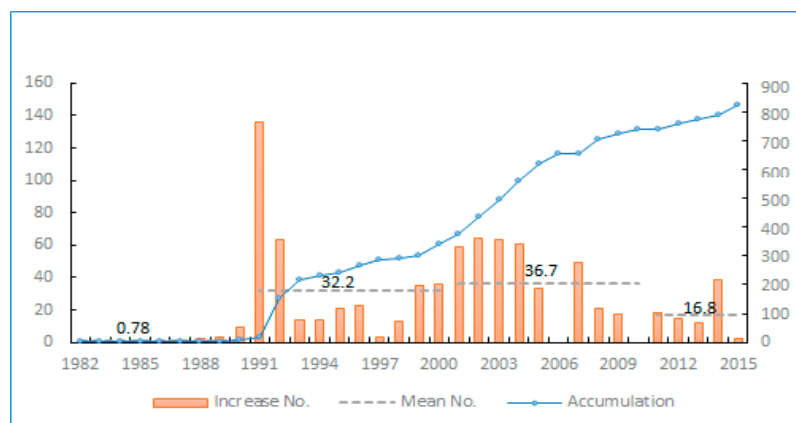


Figure 6. The annual and total numbers of newly approved NFPs in China (1982–2015). (Information collected from the official website of NFGA (<http://www.forestry.gov.cn/>)).

3.4.3. Spatial Variation

Figure 7 illustrates the spatial distribution of approved NFP at each stage in China. Overall, NFPs are unevenly distributed across China. Irrespective of the development stage, most of the newly approved NFPs were located in southeast or central part of China, while the number of NFPs issued in western and northern regions such as Xinjiang autonomous region, Tibet autonomous region and Inner Mongolia remained relatively small. The areas where NFPs were first established was the central and eastern regions of China, and then NFP establishment slowly expanded to the southeast and northeast area. This trend may be related to regional economic development, public demand, high construction difficulties, and so forth, all of which will be discussed in the next section. The northwest region did not begin to establish NFPs until the second development stage. The earliest established NFPs in northwestern China were in the Xinjiang autonomous region, followed by Qinghai Province and Tibet autonomous region. Moreover, the southern region, southeastern region, and northeastern region have seen a higher NFP density due to the rapid expansion during the second and third stages of development, while the central region is still on the rise.

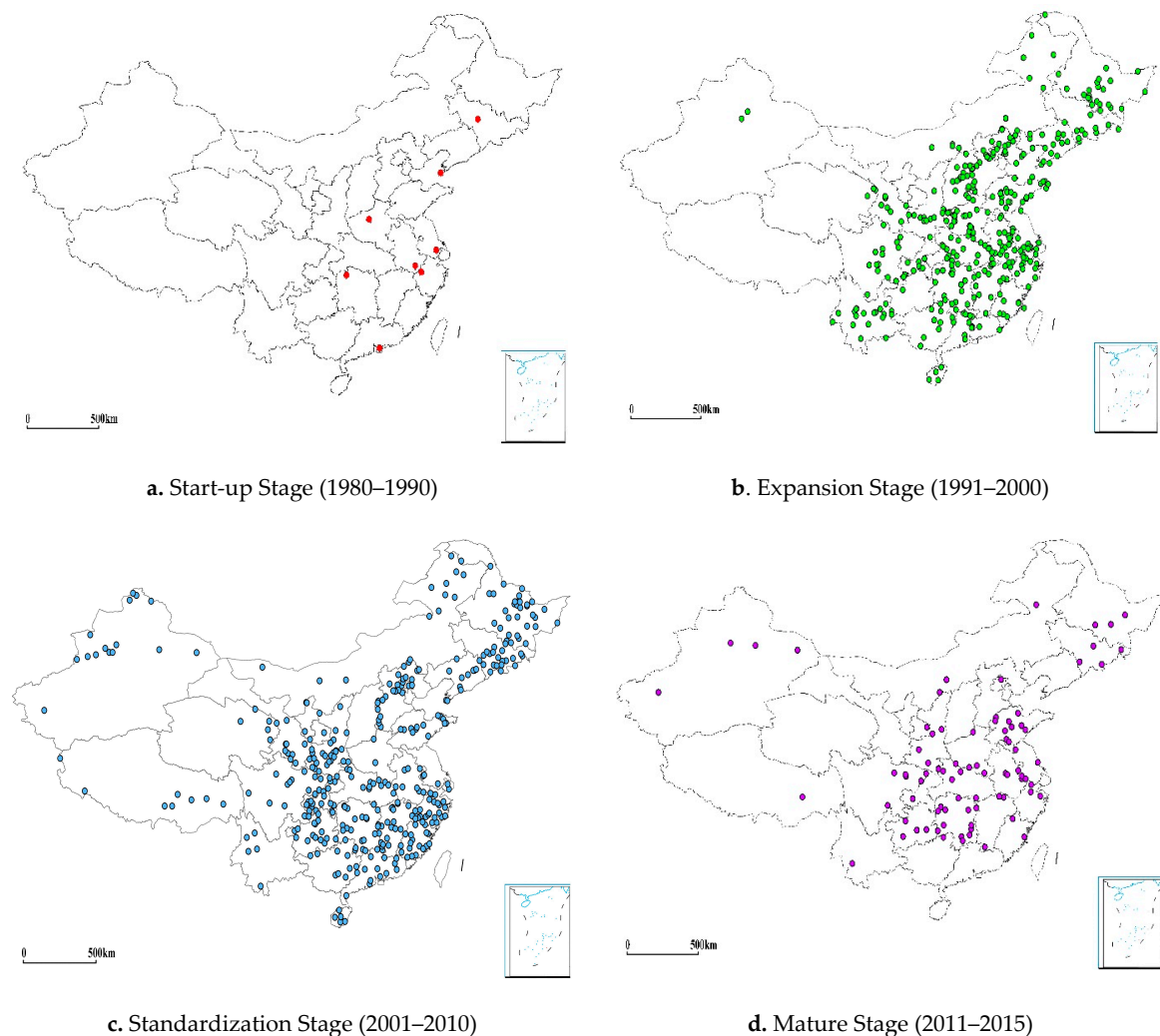
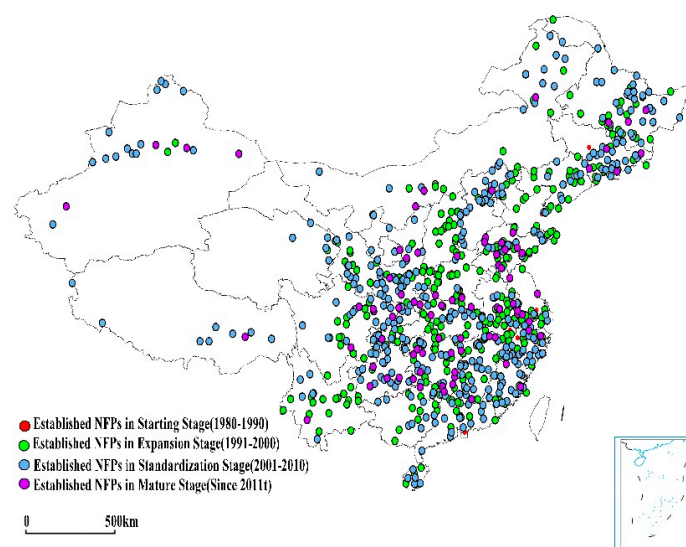


Figure 7. *Cont.*



e. Total NFPs' spatial distribution by the end of 2015

Figure 7. The spatial distribution of approved NFP during each respective development stage in China (1982–2015): (a) Start-up Stage (1980–1990); (b) Expansion Stage (1991–2000); (c) Standardization Stage (2001–2010); (d) Mature Stage (2011–2015); (e) Total NFPs' spatial distribution by the end of 2015. (Base map downloaded from <http://bzdt.nasg.gov.cn/>).

3.4.4. Categorization

The NFP program is mainly focused on the construction and conservation of forest landscape resources. The formation of forest landscape resources is affected by many factors, such as topography, climate, elevation, soil condition, and precipitation [33]. This results in the simultaneous appearance of multiple types of forest resources in the same forest park. Therefore, there is no clear division of the types of NFPs in China. This research introduces three forms of classification of NFPs that are commonly used in China (as shown in Table 3).

Table 3. Different categories of NFP with examples of specific areas. (Information collected from the official website of NFGA (<http://www.forestry.gov.cn/>)).

Division	Type	Representative NFP
Geomorphic Feature	Mountain Scenic	Zhangjiajie NFP, Taishan NFP, Huangshan NFP, Taibaishan NFP
	Rivers or Lakes Scenic	Qiandaohu NFP, Nanwan NFP
	Coast-Island Scenic	Pingtian Island NFP, Qinhuangdao NFP
	Desert Scenic	Yulin Desert NFP,
	Volcanic Scenic	Aershan NFP, Huoshankou NFP
	Spelean Scenic	Lingyandong NFP, Shuanglongdong NFP
	Grassland Scenic	Huanggangliang NFP
	Waterfall Scenic	Qishan NFP
	Hot Spring Scenic	Longsheng Hot-spring NFP

Table 3. Cont.

Division	Type	Representative NFP
Travel Distance	Urban Scenic	Haerbin NFP
	Country Scenic	Fuzhou NFP
	Wild Scenic	Tianshan Grand Canyon NFP
Forest Ownership	Belonging to State-owned	–
	Belonging to Collective owned	–
	Belonging to both State-owned and collective owned	–

First, according to the geomorphologic landscape, NFPs can be divided into ten types (Mountain Scenic, Rivers or Lakes Scenic, Coast-Island Scenic, Desert Scenic, Volcanic Scenic, Spelean Scenic, Grassland Scenic, Waterfall Scenic, Hot Spring Scenic). Secondly, according to radius of tourism, which refers to the distance from tourist accommodation like city to NFP, NFP can be divided into three types: urban, rural, and wild. Thirdly, when focusing on land ownership, NFPs can be divided into three types, namely those established on the state-owned forest land, collectively-owned forest land, or land that is both state- and collectively-owned. NFPs established on state-owned forest land occupied 70% of the total [20,34,35].

4. Discussion: Contributions and Challenges Associated with Development of NFPs

It is undeniable that during 33 years of NFP development has made important contributions to society. There are still many problems that require attention. Below, the contributions and challenges are elaborated from economic, social, and ecological aspects.

4.1. Economic Aspect

Since the first Zhangjiajie NFP has established, the number of forest-based tourist and the economic benefits brought by NFPs have grown by leaps and bounds in the regions. According to official statistics, by the end of 2015, a total of 450 million people had visited the 826 NFPs, accounting for 19.5% of the total domestic tourists. Out of all visitors, 14.1 million were foreign tourists (NFGA, 2015). Among 826 NFPs, there are 54 NFPs charge free, and 772 NFPs require admission ticket. Overall, the tourism income of 826 NFPs totaled 53.97 billion yuan (7.99 billion USD), with 339 NFPs having an income of over 10 million yuan (1.48 million USD) and 73 NFPs having a revenue of over 100 million yuan (14.76 million USD). The average tourism income for the 772 NFPs with tourism income was 69.9 million yuan (10.32 million USD). Meanwhile, for the establishment of administrative departments by local governments, individuals and enterprises investment, and stimulate local residents' entrepreneurship, NFPs have directly created 172,300 jobs (23% permanent and 35% short-term employed) and 7% NFPs had become a leading industry in their region by the end of 2015 (NFGA, 2015). All this data shows that the development of the forest-based industry in China by establishing NFPs has achieved remarkable success and generated significant economic benefits.

However, the experts indicated that, there is a tendency for planning schemes to become more homogenized and marketing become more monotonous. Without areas having their own characteristics, it is difficult to attract tourists, which is hardly conducive for the development of NFPs in the long run. Also, the weakness in marketing like undervalue in marketing, not grasp diversified frontier propaganda approach, insufficient invest in propaganda, which will directly led to less popularity, less revenue, and caused a vicious circle of declining tourist interest.

4.2. Social Aspect

Establishment of the first NFP (Zhangjiajie NFP) marked the beginning of China's forest-based tourism industry. This was fundamentally promoted the development of forest-based tourism industry

in China and led to a turning point in the Chinese forestry industry by providing new opportunities for the traditional forestry industry from transforming damaged forest environment to protected areas [35]. What's more, the NFP program also offered opportunities for development in remote and/or undeveloped areas. Most of the NFPs are located in suburban and rural areas, where there are fewer opportunities. The economic prosperity initiated by NFPs created more employment opportunities and new ways to earn profits. Remoteness and accessibility issues make tourists inclined to stay overnight, which can further offer opportunities for the development of service industries related to accommodation and food services.

Furthermore, the establishment of NFP provide resources for the public to obtain forest-based knowledge. Although the NFPs cannot impart knowledge to the public systematically, they can demonstrate characteristics of regional forest landscapes offer opportunities for combing theory and practice. For instance, forest maintenance measures offer public access to forest-based knowledge. Meanwhile, the construction of the NFP system in China has also popularized forest resources to the public and demonstrated China's forest culture to the world.

Despite all these positive social influences of NFPs mentioned above, there are still some challenges threatening NFPs' sustainable social influence. First of all, unbalanced distribution. The majority of NFPs established to date are located in the southeastern or central part of China, while the number of NFPs issued in western and northern regions is still relatively small. The western and northern areas also contain unique forest landscapes, cultural heritage and have markets for forest-based tourism. Given West (2006) [36] and Buckley (2012) [8] have pointed out that national parks, to a certain extent, the products of country's development. Socio-economic, policy, scientific, and population factors could be the main factors influencing the development of NFPs [37]. Which means that western and northern regions with poor economic conditions might struggle to boost NFP's development on their own. The management departments should provide incentives criteria for accelerating the area with poor economies like western and northern regions in China establishing NFP. Measurement such as increasing granted funding, expand the influence of regional forest landscape propaganda, lower construction requirements for special areas could achieve the incentive effect.

Secondly, there still a gap between the management and implementation. In order to regulate the construction of NFPs, the NFGA has issued GMPNFP, containing 15 sub-item requirements. Although the regulations can promote the holistic and sustainable development of NFPs, most of the NFP projects failed to completely implement this in practice. This is especially the case for NFP projects established before 2012. For instance, through analyzing the completion of each NFP project planning document for 15 planning requirements, it was found that 27.7% NFPs fail to fully implement GMPNFA in practice. The five sub-items that have been implemented least are Community Development (13.6%), Capacity Prediction (19.1%), Construction of Ecological Culture (23.3%), Conservation (30.1%), and Investment-Benefit Analysis (39.9%).

Unclear supervisory responsibilities are another issue. NFPs fall under the jurisdiction of the NFGA. However, the majority of NFPs in China are still part of the system of nature conservation, water conservation or scenic areas, which fall under different authorities [32]. This phenomenon resulted in overlapping areas of management in different sectors and practices to produce the contradiction.

Last but not the least, analysis of existing statistics clearly shows that the classification of NFPs is ambiguous. The main objective of the NFP program is the forest landscape, but there is no classification according to forest landscape type within the common classification system. Also, the NFP system does not contain a complete statistical system for recording the status of forest landscape resources and ecological resources in each NFPs. This will greatly hinder the management and sustainable development of NFPs.

4.3. Ecological Aspect

NFPs play a vital role in promoting the protection of important forest landscape resources and rare natural resources. The most important source for the construction of NFPs are forest landscape resources, so priority has been given to their protection. Thus the Chinese government attaches great importance to the protection of forest landscape resources and forest ecosystem in NFPs. This is reflected in establishment of the China Forest Landscape Resources Evaluation Committee, which has issued several policies and regulations related to environmental protection and environmental development impact assessment such as the Notice on Further Strengthening the Construction of Ecological Culture in NFP (2007), the Opinion of the Central Committee of the Communist Party of China, and the State Council on Promoting the Reform of Collective Forest Tenure (2008). On the other hand, through analyzing the planning documents of 826 NFPs, it was found that about 63% of NFPs were well protected in terms of their local forest landscape resources, and their area, size, and status were maintained in the original state. The characteristic forest landscape resources of some NFPs have even increased under the protection of the management department. This is the case for e.g. the Wudalianchi NFP in Heilongjiang, and Longwanqun NFP in Jilin, which further prompted them to be certified by international nature conservation organization [32].

On the other hand, despite the positive role on the protection of forest landscape resources and forest ecosystem NFP played, new problem had emerged. Phenomena such as soil erosion, air pollution, water pollution, landscape pollution, ecological degradation, vegetation trampling, and wildlife disturbance in the developing area are becoming major concerns in China [12,25,27,38–42]. To attract and serve tourists, more recreational and commercial facilities have been built. This can be problematic, as some NFPs projects are in sensitive areas where environmental and ecological damage can easily occur [43]. While due to the economic and social benefits, increase in government taxes and achievement of related functionary could bring by these facilities, the local government ignore their damage to the ecology, but indirectly contributed to its construction. For example, the construction of a sky elevator on the side of a rock tower in Zhangjiajie NFP caused serious soil erosion and degradation of the ecological environment (Figure 8) [26,44]. The Chinese and biosphere national committee pointed out that due to lack of pre-planning, insufficient funds, poor maintenance, and uncivilized behavior of tourists, about 22% of NFPs area have seen their forest environment damaged, and 11% of tourism resources have been degraded [30]. Even though ecological protection is clearly required according to the GMPNFP, many ecological destruction phenomena are still occurring. Therefore, there is still a gap between policy and implementation. Moreover, tourist activities are another issue, especially during the peak tourist season when large crowds of tourists put some areas at serious risk of ecosystem degradation. Wu pointed out that uncivilized behavior of tourists has resulted in 44% of NFPs facing massive waste problems [45]. Waste such as containers, tissues and plastic bags are thrown all around the park affecting wildlife and leaving 12% of water bodies contaminated. Service facilities like food services and vehicle traffic can aggravate air pollution and reduce green space areas [39]. Additionally, due to the simplification of the initial investment source, the majority of the NFPs' initial investments have been insufficient [46]. As a result, there is a transformation of some NFPs shifting to focusing on social and economic benefits rather than the conservation of ecosystem.



Figure 8. Sky Elevator in Zhangjiajie National Forest Park (source: <http://www.cn-zhangjiajie.cn/index.html>).

5. Conclusions

This research has undertaken a holistic review of the status of NFPs in China. Results show that from 1982 to 2015, the number of NFPs increased dramatically. However, NFP development has been unbalanced in regional distribution. When analyzing the evolution of NFPs, the main issues to date have included, among other, failure to implement Master Plans in practice and unclear supervisory responsibilities. Nonetheless, almost all adverse factors can be mitigated by strengthening government supervision and good governance. The future development of the NFPs in China should primarily consider how to balance the conflict between economic interests and environmental protection. Since there are still some problems that constrain NFPs' sustainable development, reasonable measures like strengthening government supervision, establishing a clear division of responsibilities, raising government awareness, controlling the number of visitors, limiting expansionary construction, promoting protection of culture and resources, and enhancing marketing and publicity could alleviate these adverse effects.

On the other hand, as numerous researchers have found that similar challenges have not just occurred in China but also in developing countries like Thailand, Tanzania, and Zambia, as well as developed countries like Canada, the United States, and Japan [15,28,47–50]. This has been the case for protected area created for the public good like NFPs (in China), National Parks (in Canada, the United States, and elsewhere), and Quasi-national parks (in Japan), even the woodlands and wetlands in or around the city that need to be protected. As this research shows, proper policy guidance can better promote the protection of the land in a better direction. However, due to the presence of conflicts among the economic interest and environmental protection, in order to make them more sustainable in process of protection and rational development, better supported by sound governance maybe a good choice. Furthermore, as a pioneer in the protection, utilization and development of forest in China, NFP has produced tremendous social, cultural and economic contributions and accumulated rich experience in forest management. At the present stage, China now implements forest protection, prohibiting the deforestation of most forest areas, and promoting the development and utilization of forest ecology and socio-economic values [51,52]. The valuable management experience of the NFP can play a positive role in promoting the protection and utilization of forests in China's urban forests, suburban forests, and rural forests. Overall, this research focused on the NFPs in China

will hopefully provide some guidance for future policy making to balance of the interests of the environment, stakeholders, and the public at large.

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