



Strategies for Leveraging and Safeguarding Biodiversity at Xuan Son National Park, Phu Tho Province, to Foster Sustainable Tourism Development

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Article History

Received: 04.02.2025

Accepted: 11.03.2025

Published: 13.03.2025

Abstract: The interplay of topography, climate, soil, and the strategic location at the junction of the Northeast and Northwest regions has endowed Xuân Sơn National Park with a remarkable ecological diversity. This region hosts a variety of quintessential ecosystems of Vietnam, with particular emphasis on the forest ecosystems of limestone and sedimentary mountains, which remain largely pristine. Such forested areas are now scarce in the country. These conditions provide a unique opportunity for the Xuân Sơn ecosystem to foster economic advancement. However, this ecosystem remains delicate and necessitates measures for its protection and sustainable, judicious utilization.

Keywords: Exploitation, conservation, biodiversity.

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1. INTRODUCTION

Xuan Son National Park, situated in Tan Son District, Phu Tho Province, is a protected area of considerable environmental significance, boasting a high level of biodiversity and, notably, preserving pristine features that remain largely unaffected by human activities. These favorable conditions offer a solid foundation for the development of tourism within the park. However, tourism initiatives at Xuan Son National Park have yet to realize their full potential, falling short of aligning with its inherent capabilities.

Tan Son is among the most economically disadvantaged districts in Phu Tho Province, predominantly inhabited by ethnic minority groups, many of whom continue to face substantial socio-economic challenges. Promoting economic development within Xuan Son National Park would play a pivotal role in improving the living standards of the local population. Nevertheless, there are

considerable obstacles and constraints in ensuring the sustainable protection of biodiversity while simultaneously fostering economic growth in the region.

2. CONTENT

2.1 Overview of the Study Area

Xuan Son National Park is situated within the administrative boundaries of the communes of Xuan Son (comprising five villages: Du, Lap, Coi, Lang, Lung Mang), Dong Son (Thon village), Xuan Dai (Nuoc Thang village), and Kim Thuong (Xoan, Tan Ong, Ha Bang villages). It lies in the western region of Tan Son district, at the confluence of the borders of three provinces: Phu Tho, Hoa Binh, and Son La. Geographical coordinates: 21°03' - 21°12' North latitude and 104°51' - 105°00' East longitude. Boundaries: To the north, it adjoins Thu Cuc commune; to the south, it borders Da Bac district (Hoa Binh province); to the west, it neighbors Phu Yen district (Son La province); and to the east, it abuts

Citation: M.A. Đào Thị Kim Quế, M.A. Ngô Ngọc Tuyên, M.A. Phạm Phong Lan, M.A. Nguyễn Thanh Bình (2025). Strategies for Leveraging and Safeguarding Biodiversity at Xuan Son National Park, Phu Tho Province, to Foster Sustainable Tourism Development. *Glob Acad J Humanit Soc Sci*; Vol-7, Iss-2 pp- 66-71.

the communes of Tan Phu, Minh Dai, and Long Coc (Phu Tho province).

The buffer zone of Xuan Son National Park encompasses an area of 18,639 hectares, which includes the communes of Kiet Son, Lai Dong, Minh Dai, and portions of the communes of Dong Son, Tan Son, Kim Thuong, and Xuan Dai, all within the same district. The core area spans 15,048 hectares, with a strictly protected zone of 11,148 hectares, an ecological restoration zone combined with the conservation of historical sites covering 3,000 hectares, and an administrative and service zone of 900 hectares. A unique characteristic of Xuan Son is that it is the only national park with pristine forests located on limestone mountains (2,432 hectares).

Xuan Son National Park is entirely located within Tan Son district, a mountainous area in Phu Tho province. This district has the largest natural area in the province and also boasts the largest forested area and population of ethnic minorities.

Xuan Son National Park lies at the boundary between the Northwestern and Northeastern regions of Vietnam, two major biogeographical areas that are home to a wealth of rare and valuable flora and fauna. This unique location creates favorable conditions for the richness and biodiversity of the region.

On the other hand, due to its inland location, transportation remains challenging due to the terrain and limited infrastructure. As a result, the primary mode of transport within the area is by road, with only small concrete roads within the core area of the park. This has contributed to easier protection efforts and minimized human impact on forest resources. Situated about 40 km from Thanh Son town, 100 km from Viet Tri city, and 120 km from Hanoi, the park's location offers favorable conditions for the development of tourism activities.

2.2 Current Situation

2.2.1 Biodiversity of Xuan Son National Park

Xuan Son National Park is home to 1,179 species of vascular plants, belonging to 650 genera and 175 families, including 52 species from the Gymnosperms and Conifers groups. The park also contains 91 species of fish, 75 species of reptiles and amphibians, 241 species of birds, and 76 species of mammals.

Located at the intersection of two plant zones—Malay and South China—the plant life in Xuan Son is dominated by species such as oak, chestnut, and magnolia. Additionally, Xuan Son features typical species of the Northwestern region, including salt trees, Ziziphus trees, devil's face trees, and various species of shorea, ironwood, ebony,

bitter bamboo, and golden bamboo. Notably, the shorea forests in Xuan Son are among the most beautiful and richest in northern Vietnam. Xuan Son is also a vast repository of native plant species and a treasure trove of medicinal plants, especially the naturally occurring wild sǎng herb, which has the highest density in the northern region.

2.2.1.1 Ecosystem Diversity

Xuan Son boasts a rich diversity of ecosystems (Ecosystem types) and forest vegetation, with 09 distinct ecosystem types:

- Tropical evergreen rainforest ecosystem
- Tropical evergreen rainforest ecosystem on karst limestone
- Subtropical evergreen rainforest on low mountains and karst limestone
- Subtropical evergreen rainforest on low mountains
- Secondary forest ecosystem regenerating after shifting cultivation
- Secondary forest ecosystem with bamboo and rattan
- Plantation forest ecosystem
- Grassland, shrubland, and scattered tree ecosystem
- Agricultural ecosystem

To some extent, these ecosystems are not the primary focus of protection in conservation areas, but on the other hand, they serve as habitats for specific groups of species.

2.2.1.2 Species and Genetic Diversity

The natural conditions of Xuan Son National Park provide a rich diversity of plant and animal species. It can be confidently stated that Xuan Son National Park exhibits a very high level of biodiversity in terms of species composition, genetic resources, and ecosystems. The plant composition in Xuan Son includes all the plant elements relevant to the flora of Vietnam. First and foremost, it contains the flora of northern Vietnam and southern China, with representative species from families such as Fagaceae (chestnut), Lauraceae (laurel), Fabaceae (legumes), Magnoliaceae (magnolia), among others. This is the dominant component of Xuan Son's vegetation. Additionally, there are other migrating plant groups, including those from the Malay-Indonesian region, the Yunnan-Phu Quoc-Chu region, the foothills of the Himalayas, and the western and southwestern regions.

Xuan Son National Park boasts an exceptionally rich plant resource base, surpassing many other national parks and nature reserves in northern Vietnam, particularly in terms of species and genus diversity.

Table 2.1. Distribution of Different Taxa in the Flora of Xuan Son National Park

Scientific Name	Number of Families		Number of Genera		Number of Species	
Psilotophyta	1	0,6%	1	0,1%	1	0,1%
Lycopodiophyta	2	1,1%	3	0,4%	6	0,5%
Equisetophyta	1	0,6%	1	0,1%	1	0,1%
Polypodiophyta	22	12,2%	38	5,9%	74	6,1%
Pinophyta	3	1,6%	4	0,5%	5	0,4%
Magnoliophyta	51	83,9%	633	93%	1130	92,8%
Total	180	100%	680	100%	1217	100%

(Source: Management Board of Xuan Son National Park)

The fauna of Xuan Son serves as a transitional zone between the Northwestern and Northeastern regions of Vietnam. As a result, the fauna here includes not only species and subspecies

typical of the Northwestern region, such as the Grey Langur and Black Gibbon, but also representatives from the Northeastern region, such as the Musk Deer and the White-headed Langur.

Table 2.2. Species Composition of Mammals, Birds, Reptiles, Amphibians, and Insects in Xuan Son National Park

No	Class	Number of Orders	Number of Families	Number of Species
1	Mammals	8	24	76
2	Birds	15	47	182
3	Reptiles	2	14	44
4	Amphibians	1	6	27
5	Insects	7	66	551
Total		33	157	880

(Source: Management Board of Xuan Son National Park)

Species Diversity: The animal species composition of Xuan Son National Park is relatively rich, comparable to other large protected forests in northern Vietnam, such as Cat Ba, Tam Dao, and Ba Be.

Thus, it can be observed that Xuan Son National Park boasts very high biodiversity, with a variety of ecosystems, species, and rare genetic resources. Among the 30 national parks in the country, Xuan Son ranks third in terms of biodiversity, hosting endemic species as well as rare species listed in the Vietnam Red Book and the International Red List. This represents a valuable resource with significant scientific, educational, tourism, recreational, and human well-being benefits.

2.2.2. The Impact of Biodiversity on the Formation and Development of Tourism Types at Xuan Son National Park

2.2.2.1. Ecotourism

The natural strengths of the park lie in its landscape value, ecological significance, and especially the pristine nature of an area that has been relatively unaffected by external influences. Visitors to Xuan Son will be able to admire unique landscapes with the fascinating changes across ecosystems. Along the exploration route in Xuan Son, tourists will experience the intriguing transitions as they move from one ecosystem to another.

Moreover, Xuan Son National Park is considered one of the top three regions in Vietnam with the highest biodiversity, home to many endemic species listed in the Vietnam Red Book and the International Red List. Situated at the crossroads of two plant zones—Malay and South China—Xuan Son’s flora is dominated by species such as Shorea, Chestnut, Oak, and Magnolia. Additionally, it is home to typical species of the Northwestern region, such as salt trees, devil’s face trees, shorea, and golden bamboo.

Xuan Son National Park is also especially attractive to tourists due to its rich diversity of animal species. Notably, it is home to the rare *Tylototriton vietnamensis* (Vietnamese rough-skinned newt), found in the streams of Ten Mountain at an altitude of 1,244 meters. This species is particularly remarkable for its ability to regenerate lost limbs and tail. The park also hosts a unique local breed of chicken, the “Nine-Cock Chicken,” which is so revered by the local people that it is often called “Sacred Chicken.” This chicken breed is predominantly found in the Coi village.

2.2.2.2. Recreational and Health Tourism (or Wellness Tourism)

Xuan Son National Park has a fresh, cool climate similar to the summer weather of temperate regions, combined with peaceful, beautiful, and poetic landscapes that remain largely unspoiled by

external influences. This makes it an ideal place for tourists looking to relax after stressful work hours. What is particularly special about the climate in Xuan Son National Park is that throughout a single day, visitors can experience weather changes corresponding to the four seasons—spring, summer, autumn, and winter. The morning is cool and fresh like spring, the afternoon is warm like summer, the evening is mild like autumn, and the night brings a slight chill, which is quite an interesting experience.

Unlike wellness tourism at Tam Dao National Park, where altitude plays a significant role, the microclimate of the limestone valley in Xuan Son creates favorable conditions for wellness tourism. Visitors can enjoy the comfort and relaxation provided by the park's climate without needing to ascend to higher altitudes.

Xuan Son National Park is also rich in medicinal plants, with 665 species of medicinal plants accounting for 54.6% of the total species in the park. Among these are many rare and valuable medicinal plants such as ginseng and Job's tears. In Lang village, at the foot of Ten Mountain, there are many well-known herbalists who use plants sourced directly from the park to treat illnesses. Lang village is also the only village in Phu Tho with the highest number of residents over 100 years old, making it an ideal destination for wellness and healing.

Thus, wellness tourism in Xuan Son National Park has great natural advantages for development. However, to promote this type of tourism, Xuan Son National Park must not only exploit its climate, landscape, and medicinal plants but also focus on ecological conservation, protecting and maintaining precious medicinal plants, and improving infrastructure to meet the increasing demands of visitors.

2.2.2.3. Sports Tourism (Adventure Tourism)

Xuan Son National Park has great potential to develop this type of tourism, especially due to its diverse and rich topography, which forms a complex system of mountains and forests, with a still prevalent primary forest ecosystem and caves deep within the dense, mysterious woods.

Compared to other mountainous areas in the Northwest, the mountains in Xuan Son National Park are not high or rugged. However, the unique feature of the terrain here is the perfect combination of the mountains and the surrounding scenery. When visitors conquer these peaks, they experience an exhilarating feeling from the natural blend of elements that is both accidental and incredibly valuable. Specifically, the three mountain peaks above 1,000 meters—Ten, Voi, and Can—form a

magnificent natural triangle, making it an ideal location for mountain climbing tourism. Connecting these three peaks creates an equilateral triangle with sides approximately 4.5 km long, all covered by pristine forests. This enhances the sense of exploration when tourists conquer these mountains.

What makes adventure tourism at Xuan Son National Park particularly special is that visitors can not only hike the mountains but also explore some of the most majestic caves in Vietnam. For those who enjoy adventure, trekking through the dense, shadowy forests, discovering mysterious caves, or conquering high peaks, Xuan Son offers an exciting destination. Notably, in the limestone mountain system of Xuan Son National Park, a rich, diverse, and unique system of caves has been discovered, a natural gift of the region. Some of the caves are particularly beautiful and have their own unique charm, such as Lun Cave and Lang Cave. The system of rivers, streams, and waterfalls has created a pristine, fascinating natural landscape for Xuan Son National Park. Some of the streams and waterfalls that tourists can admire include Lap Stream (Lap village), Thang Stream with its clear, sparkling waters, and waterfalls such as Lung Troi Waterfall. Many of the waterfalls reach over 50 meters in height, covering caves and crevices with a silver waterfall mist blending with the green of the ancient forest, creating a landscape that is both majestic and poetic. These are also quite attractive scenic spots for visitors.

2.2.2.4. Specialized Tourism

In addition to the cultural uniqueness of the ethnic groups living within the park, Xuan Son National Park's natural advantages stand out as the most significant. To develop this type of tourism, the park's strengths lie in the diversity and rarity of its plant and animal species, its limestone mountain landscapes, and the pristine, mysterious natural surroundings. Despite being relatively newly established, specialized tourism in the park has grown significantly. Xuan Son National Park has welcomed numerous tourist groups, including students, researchers, particularly those in forestry and agriculture, as well as speleologists, who come to study, explore, and conduct scientific research.

2.2.2.5. Trekking Tourism (Hiking and Exploration)

In Xuan Son National Park, the development of trekking and exploration trails is based on the natural and social values of the area, which is both highly advantageous and meaningful, especially when combining nature exploration with an understanding of the human and cultural aspects of the visited areas. The development of this tourism type not only helps preserve the natural landscape

but also helps retain and promote the beautiful cultural aspects of the local people's lives.

The nature of Xuan Son National Park is magnificent, with its multi-layered, dense, and wild primary forests, interspersed with the villages of ethnic minorities living in the forest. This offers an exciting opportunity for tourists to walk and explore the forest, discover nature, and learn about the unique lives of the indigenous people. This creates a distinctive experience that stimulates visitors' curiosity about the park.

Nature and people in Xuan Son National Park seem to be one harmonious entity, remaining largely untouched by external influences. The mountains, forests, plants, animals, rivers, waterfalls, and the people all blend together to form a picturesque scene. Xuan Son National Park stands out with its unique natural features such as the rugged mountains, beautiful streams, waterfalls, caves, and the pristine forest ecosystems with layered canopies. The park also hosts characteristic plant and animal species, alongside indigenous villages such as Xom Coi, Xom Du, and Xom Lang. The culture is rooted in ancient agricultural civilization, with warm-hearted, friendly, and hospitable people who still retain many customs and traditions. These include the Dao people's door-lifting tradition, the unique dances of the Muong and Dao ethnic groups, the custom of "hair-tying" to find a romantic partner in Xom Coi, the "Lap Tich" ceremony, and the enjoyment of local delicacies.

2.3. Solutions for Exploiting and Protecting Biodiversity to Support the Development of Tourism Types at Xuan Son National Park

2.3.1. Strengthening the Organizational Management System

This is the most important solution for improving management capacity, protecting natural features, biodiversity, and organizing tourism activities at the park.

To prevent illegal logging, the Thanh Son and Xuan Son Forestry Departments have set up three forest guard stations at strategic locations on roads and rivers: Co Station (Minh Dai), Du Station, Lang Station (Xuan Son), and Veo Station (Kiet Son).

Currently, to strengthen management capacity and support socio-economic development activities in the core and buffer zones, it is necessary to increase staffing, enhance training, and attract local communities to participate in forest protection and biodiversity conservation efforts at the park. Local people are involved in various areas, such as forest protection contracts and successful forest planting projects.

2.3.2. Division of Functional Zones

The proposed functional zones are as follows:

- **Strict Protection Zone:** Strictly protect all forest resources, forest land, landscapes, biological resources, and historical sites within the zone. Conduct scientific research on forests, forest flora and fauna, geography, landscapes, climate, and hydrology, according to the programs set by the national park. Provide education and training on nature conservation. Carry out eco-tourism and ecological visits.
- **Ecological Restoration Zone:** Protect all forest resources, forest land, landscapes, biological resources, and historical sites within the zone. Restore areas of degraded forest caused by human activities through methods like regeneration protection and afforestation. Conduct research on forestry, fauna, flora, geology, and hydrology. Organize eco-tourism visits.
- **Administrative and Service Zone:** This zone is the headquarters of the national park management board and serves as the center for directing conservation activities, scientific research, organizing tourism services, supporting socio-economic development activities, and promoting education within the region.
- **Buffer Zone:** This is the protective belt, a barrier to safeguard the national park. The buffer zone works in conjunction with the national park to improve local living standards, ensure sustainable and rational land and resource use, restore ecosystems, and create favorable economic conditions for the local community to reduce pressure on the national park. The national park is responsible for coordinating with the local authorities in the buffer zone to support socio-economic development, promote agriculture and forestry, assist technical staff, and provide education on land use, nature conservation, and environmental protection. The national park should also create opportunities to attract investment projects for the economic development of the buffer zone.

2.3.3. Socio-economic Development Solutions for Local Communities in the National Park to Reduce Pressure on the Park's Natural Resources

The socio-economic development solutions include: building and upgrading infrastructure, developing food crop projects to ensure food security for the buffer zone; projects for planting sãn vegetables; projects for land and forest allocation to local communities, allowing residents to participate in the sustainable and responsible exploitation and protection of forest resources... Although these projects are newly implemented, they have initially shown effectiveness in alleviating poverty for the

local people and in encouraging their involvement in forest protection and forest resource management.

2.3.4. Solutions for Developing the National Park into a Key Tourism Area of Phu Tho Province

- Proceed with dividing the park into specific tourism zones:
- Scenic Tourism Zone (Core area of Xuân Sơn National Park).
- Thạch Kiệt - Tân Phú Urban Tourism, Trade, and Service Zone.
- Minh Đài - Văn Luông Urban Cultural and Sports Tourism Zone.
- Semi-wild Animal Farming and Breeding Zone.
- Mobilize all sources of funding from local savings, state budgets, domestic investment through investment projects, as well as funds from businesses and local communities to invest in building the necessary infrastructure and facilities to serve tourists.
- Invest in developing and training tourism human resources for the park.

2.3.5. Solutions to Enhance the Unique Appeal of Xuân Sơn National Park Tourism Area

Key highlights in each functional zone:

- Scenic Tourism Zone (Core area of Xuân Sơn National Park).
- Thạch Kiệt - Tân Phú Urban Tourism, Trade, and Service Zone.
- Minh Đài - Văn Luông Urban Cultural and Sports Tourism Zone.
- Semi-wild Animal Farming and Breeding Zone.
- Improve the quality of existing tourism products and develop new ones to create distinctive tourism offerings.

2.3.6. Solutions for Linking Tourism Spaces to Create Attractive Routes and Tours for Visitors

Xuân Sơn National Park is located at the end of the Hoàng Liên Sơn mountain range, serving as a gateway between the Northwest and the Red River Delta. To the southwest is the Phu Canh Nature Reserve and the Hòa Bình Hydroelectric Plant. To the northwest is the Tà Xùa Nature Reserve and the Sơn La Hydroelectric Plant. To the northeast is the Hùng Temple Historical Site. To the southeast is the Thanh Thủy Mineral Spring Tourism Area. Thus, Xuân Sơn is situated in the economic and tourism development region of the Northeast and Northwest. Additionally,

Xuân Sơn National Park lies along National Highway 32, which connects Hanoi to the mountainous provinces in the Northwest, making it a promising destination for tourists traveling along this route.

Compared to other national parks in the North, such as Ba Bể (Bắc Kạn), Hoàng Liên (Lào Cai), Cát Bà (Hải Phòng), Bái Tử Long (Quảng Ninh), Cúc Phương (Ninh Bình, Thanh Hoá, Hòa Bình), Xuân Sơn National Park has several advantages, such as being reasonably distanced from major urban centers and tourism areas. It is approximately 92 km from Hanoi, 32 km from the Thanh Thủy Mineral Spring Tourism Area, 55 km from the Đồng Mô Tourism Area, 44 km from the Suối Hai Tourism Area, 47 km from the Hùng Temple Historical Site, and 50 km from the Hòa Bình Hydroelectric Plant. Xuân Sơn National Park also has the potential to combine ecological tourism with cultural and spiritual tourism within the province.

3. CONCLUSION

For development, Xuân Sơn National Park needs to focus on key solutions such as: strengthening the organizational management system; functional zoning; solutions for socio-economic development for local communities within the park to reduce pressure on the park's natural resources; solutions to establish Xuân Sơn National Park as a key tourism area, attracting investment to build infrastructure and technical facilities to serve tourism; solutions to enhance the uniqueness and appeal of the Xuân Sơn National Park tourism area; solutions for linking tourism spaces to create attractive routes and tours. All these solutions are based on a sustainable approach that both protects the natural features and biodiversity of the park and provides effective tourism development strategies.

REFERENCES

- Hà Danh Đức (2021), *Textbook of Biodiversity*, Vietnam Education Publishing House.
- Institute of Ecology and Biological Resources (2008), *Biodiversity and Genetic Resource Conservation at Xuân Sơn National Park, Phú Thọ Province*, Education Publishing House.
- Phú Thọ Department of Agriculture and Rural Development (2014), *Atlas of 300 Plant Species at Xuân Sơn National Park*.
- Phú Thọ Provincial Statistics Bureau (2023), *Statistical Yearbook of Phú Thọ Province 2022*, Statistical Publishing House.