



Tourist Perceptions and Willingness to Pay for Biodiversity Conservation at Nam Nao National Park, Thailand's Newest ASEAN Heritage Site

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Received 25 December 2024 Accepted 7 April 2025 (*Corresponding Author)

Abstract ASEAN Heritage Park (AHP) designation is one of several tactics that have been used in Southeast Asia for promoting biodiversity conservation to achieve sustainable development goals. However, public awareness of this program is limited despite its initiation in 1978. This study examined tourist perceptions of Nam Nao National Park (NNNP), Thailand's most recent AHP. It estimated tourist willingness to pay (WTP) for biodiversity conservation at NNNP and identified factors that influenced their decisions. Data were collected from visitors during September to October 2024 using a self-administered questionnaire, along with interviews with park officers and onsite observations. A total of 209 visitors participated in the study, 5% of whom came from overseas. Nearly half of the respondents (45%) identified as ecotourists but lacked understanding of one key aspect: supporting local livelihoods. Most respondents were first-time visitors at NNNP who came for nature-based recreation but had never heard of AHP prior to their trip. Yet, they expressed positive opinions about building conservation awareness, encouraging participation, and supporting effective park management. About 80% of the respondents were willing to pay for biodiversity conservation (with nearly 90% confidence). The average amount was 40 Baht per year (~USD \$1.25), equivalent to the park entrance fee for Thai visitors. This finding suggests that visitors were willing to pay for biodiversity conservation at twice the current entrance fee. In exchange, visitors wanted their money to be spent on forest restoration and fire-break construction. Lastly, a generalized linear model identified type of tourist (i.e., ecotourists), travel frequency (i.e., frequent visitors > 5 times), gender (female), age, and positive perception as key drivers of WTP (p -value < 0.05).

Keywords ecotourism, biodiversity conservation, ASEAN heritage park, tourist perception, willingness to pay

INTRODUCTION

As one of the world's largest industries, tourism contributed almost USD 10 trillion to the global economy, making up 9.1% of the total global gross domestic product (World Travel and Tourism Council, 2024). Yet, tourism is also responsible for environmental deterioration, cultural erosion, and social disparities (Kumar et al., 2023). Ecotourism is a prominent alternative, defined as "responsible travel to natural areas that conserves the environment, sustains the well-being of local people, and involves interpretation and education" (The International Ecotourism Society, 2015). This concept integrates conservation efforts, community development, educational initiatives, and the promotion of nature-centric activities (Samal and Dash, 2023). Taman Negara National Park in Malaysia exemplifies the eco-conscious practices of indigenous communities (Bakar and Zainon, 2021), while Way Kambas National Park in Indonesia contributes an estimated USD 353,360 annually to local economies (Cusack et al., 2021). Unfortunately, negative outcomes such as

environmental pollution, economic leakages, and social disturbances remain common (Toro et al., 2021). Despite the presence of ecotourism in protected areas, biodiversity loss and ecosystem degradation persist, indicating the need for additional management approaches.

Initiated in 1978, the ASEAN Heritage Park (AHP) program aims to promote biodiversity conservation and sustainable livelihoods across Southeast Asia (Kim et al., 2019). Designated AHPs must adhere to specific criteria, including ecological completeness, representativeness, conservation importance, naturalness, uniqueness, and species significance (ASEAN Centre for Biodiversity, 2020). Protecting these sites is essential for the well-being of ASEAN citizens. The AHP's regional action plan requires participating countries to implement integrated conservation and development projects that promote sustainable livelihoods, active community participation, cultural exchange, and responsible tourism practices, while ensuring that management efforts align with AHP's criteria to protect habitats, biodiversity, and livelihoods through approved management plans (ASEAN Centre for Biodiversity, 2015, 2020). Since its inception, 57 national parks and nature reserves across 10 ASEAN countries have been designated as AHPs.

In Thailand, nine national parks were designated as AHP, including Khao Yai National Park – the World Heritage (ASEAN Centre for Biodiversity, 2024). These AHPs demonstrate ongoing efforts to balance ecotourism and biodiversity conservation. For example, Khao Yai National Park has implemented environmental education programs and active visitor management to reduce ecological disturbances, while Kaeng Krachan National Park promoting community involvement through forest patrolling and nature interpretation activities (Rattanawanawong et al., 2022; Sirivadhanawaravachara, 2024). These efforts offer useful references for understanding conservation-oriented management practices within Thailand's AHP network.

In August 2023, Nam Nao - Phu Kradueng National Park Complex was designated as Thailand's eighth AHP. This declaration underscores its ecological significance including old-growth forests, diverse flora and fauna, and unique landscapes. Phu Kradueng National Park is a well-known destination for mountain hiking, while Nam Nao National Park (NNNP) attracts those who are interested in camping and nature-based recreation. Despite its popularity, NNNP faces some significant management challenges, such as invasive species, habitat degradation, human-wildlife conflict, and pressures from economic development. Recently, a four-lane highway was proposed as part of the ASEAN East-West Economic Corridor, connecting Thailand with Myanmar and Laos. This mega construction project is expected to negatively affect NNNPs biodiversity and ecosystems. Conservation efforts can address tourism-related challenges such as waste management, increased resource consumption, and human-wildlife conflict.

OBJECTIVE

Responses from tourists and park officers were measured to determine the effectiveness of the AHP designation at NNNP. Recognition of NNNP as an AHP might influence tourist donations and contributions toward biodiversity protection. Therefore, this study examined tourist perceptions and knowledge of NNNP's AHP status. It also measured their willingness to pay (WTP) for biodiversity conservation at the park and identified factors that influence WTP decisions.

METHODOLOGY

This study was conducted at NNNP in Phetchabun province, northern Thailand. Data were collected using a questionnaire*, in conjunction with interviews with park officers and onsite observations. Yamane's formula, with a degree of error between 5% and 10%, was used to determine sample size. Moreover, to measure the amount of WTP using a contingent valuation method (CVM), Cameron et al. (1989) recommended a sample size between 200 and 2,500 for a simple statistical tolerance formula. In this study, we aimed to collect data from at least 200 visitors, including those from

* The research questionnaire was approved by the Center for Ethics in Human Research, Khon Kaen University, with the Research Code HE673218 and Reference No. KKU 660201.2.3/2940 on 05 June 2024.

abroad. The CVM, commonly used to value non-market goods, especially environmental and biodiversity resources, was applied in a bidding game format (Davis, 1963). It allows the respondents to easily identify and evaluate their WTP according to the given hypothetical conditions. Moreover, at the other end of the spectrum, respondents were invited to state a specific amount of money in an open-ended format. The value of this technique is its simplicity and suitability for field-based surveys (Akhtar et al., 2017; Odihi et al., 2021). A self-administered questionnaire, available in Thai and English, consisted of the following sections: 1) socioeconomic characteristics; 2) knowledge and perception of the AHP program; 3) perception of NNNP's AHP status and expectations; 4) perception of current management activities at NNNP; 5) experiences at NNNP and views on ecotourism; and 6) WTP for biodiversity conservation. Data analyses, including descriptive statistics, t-test, one-way analysis of variance (one-way ANOVA), and a generalized linear model, were performed using SPSS version 28.01 (IBM, 2021).

RESULTS AND DISCUSSION

Visitor Socioeconomics and Tourism Experience at NNNP

A total of 209 visitors completed the questionnaire, including 11 individuals (5%) from overseas. This finding was unexpected, considering the season and the fact that NNNP is less internationally recognized compared to other national parks in Thailand such as Khao Yai, Doi Inthanon, Phi Phi, and Similan Islands. The majority of respondents were female (57%) and under the age of 24 (76%). This age distribution is compatible with the nature of NNNP as a well-known site for activities that attract younger people. This group was largely composed of college students (69%), showing that NNNP appeals to those who have sufficient time. Most visitors reported a monthly income of less than 10,000 Baht (77%). Despite limited budgets, NNNP's affordability makes it a popular destination for young people who seek nature-based experiences (Mäntymaa et al., 2021).

About 47% of the sample were first-time visitors at NNNP, while 9% had visited more than five times during the past five years. The presence of repeat visitors suggests high visitor satisfaction (Shapoval et al., 2021). Primary reasons for visitation include education (24%), sightseeing (21%), hiking (20%), and camping (10%). These findings indicate that NNNP serves both educational purposes and caters to those interested in a variety of nature-based activities. Most of the respondents (69%) traveled with friends while 20% came with family members.

Tourist Knowledge and Perception towards the AHP Program and NNNP's Status

Most visitors (67%) had not heard of the AHP program before visiting the park. Knowledge was assessed by asking individuals to select "yes", "no" or "not sure" in response to questions and statements describing the purpose, criteria, and general information about the AHP. Responses were converted into scores: 0 for incorrect answers, 0.5 for indecisive responses, and 1 for correct answers. Summed scores were then classified into levels of knowledge: low = 0.00-0.49, medium = 0.50-0.79, and high = 0.80-1.00. Despite being unfamiliar with the AHP program, the overall average score of respondents was 0.81, indicating a high level of knowledge. Respondents recognized landscape protection, cultural preservation, sustainable tourism promotion, regional conservation efforts, and educational opportunities as the main purposes of the program. However, they lacked a clear understanding of how ecotourism could protect biodiversity and nature. Moreover, visitor knowledge about specific AHP designation criteria, such as conservation and ecology, was high (0.88), reflecting a basic understanding of its core objectives. In contrast, their general knowledge about the program was moderate (0.62). For instance, visitors did not know the total number of AHPs or the fact that NNNP had recently been designated prior to their visit.

Furthermore, respondents were asked to express their perception toward NNNP's AHP status using a 5-point Likert scale, ranging from "strongly agree" to "strongly disagree". They were also asked whether AHP status had influenced their actions or concerns on biodiversity protection. Summed perception scores were grouped into three levels: low = 1.00 - 2.33; moderate = 2.34 - 3.67;

and high = 3.68 - 5.00. Respondents strongly agreed that declaration of NNNP as an AHP site would improve public awareness. Moreover, AHP status made them feel proud of local biodiversity, raised their awareness and sense of responsibility, and encouraged participation in biodiversity conservation. However, respondents indicated that AHP status did not influence their decision to visit the park for activities such as camping, bird watching, sightseeing, and nature study.

Perception on Current Management of NNNP and Expectations from its New AHP Status

Table 1 summarizes visitor perceptions of NNNP's management and expectations regarding its AHP status. Respondents expressed a high level of agreement with current management, especially regarding the hospitality and knowledge of park officers, well-maintained facilities and reasonable fees (e.g., entrance and camping gear rental fees). Even availability of park information (the lowest-rated item) received a high level of agreement. Despite this high level of satisfaction, respondents still expected improvements, mainly in the areas of information about forest ecosystems, vegetation and wildlife along nature trails, friendliness of park officers, and the availability of local souvenirs. They did not expect much change in English-based communication, such as signage, exhibitions, or the speaking skills of park officers, since most of the visitors were Thai nationals.

Table 1 Perceptions on current management and expectations from NNNP as the AHP

Statements	Mean Score (SD)	Agreement level
Perceptions on current management activities		
1. Park facilities (e.g., restrooms, camping areas, and visitor center) are adequate, clean, and eco-friendly	4.2 (0.8)	High
2. Staff members at NNNP are hospitable, knowledgeable and effectively communicate conservation messages	4.3 (0.8)	High
3. The entrance fee is reasonable and worth paying	4.2 (1.0)	High
4. Rental fees for tent spacing and camping gears are reasonable	4.2 (0.9)	High
5. Tourist attractions (e.g., visitor center, trails, wildlife watching, waterfalls, and scenic viewpoints) at NNNP are diverse, well-maintained, and easy to access	4.1 (0.9)	High
6. Information about the park (e.g., maps, educational materials, exhibition) is readily available and informative	4.0 (1.0)	High
7. I feel safe and well-supported by the park's emergency and first-aid services	4.1 (0.9)	High
8. The park effectively uses signage and information materials to explain the AHP designation and its benefits	4.1 (0.9)	High
Overall mean score	4.2 (0.9)	High
Expectations from NNNP as the AHP		
1. English information posts and exhibition on the park's biodiversity	3.5 (1.0)	Moderate
2. Park officers with proficient English to communicate effectively with international visitors	3.6 (1.0)	Moderate
3. Information on biodiversity and ecosystems at the nature trails	4.4 (0.8)	High
4. Local communities to actively participate in biodiversity protection and conservation initiatives	4.3 (0.7)	High
5. Well-maintained Park facilities to enhance visitor experience.	4.3 (0.9)	High
6. More educational programs about local biodiversity and cultural history of NNNP for visitors to learn	4.3 (0.8)	High
7. Friendly gesture and service mind from park officers	4.4 (0.7)	High
8. Local made souvenirs	4.4 (0.6)	High
Overall mean score	4.2 (0.8)	High

Note: Agreement level score: Low = 1.00-2.33, Moderate = 2.34-3.67 and High = 3.68-5.00

Visitor Understanding and Attitudes on Ecotourism

Nature-based activities (e.g., camping, hiking, and bird watching) play an important role at national parks in Thailand. In addition to outdoor recreation, tourists often learn about the value of nature appreciation. Subsequently, they gain awareness and concern, which can trigger actions to protect nature and biodiversity. Moreover, nature-based recreation is often perceived as ecotourism; and tourists who visit national parks frequently identify themselves as ecotourists. Yet, environmental protection is only one aspect of ecotourism. Another important component, which is often overlooked, is the improvement of local livelihoods. Visitors at NNNP were asked to classify themselves as a 'regular tourist', 'ecotourist', or 'not sure'. In addition, they were asked about ecotourism practices, including environmental protection and awareness for supporting local livelihoods such as purchasing locally made souvenirs and participating in homestay tourism. About 45% of the respondents identified as ecotourists, whereas 51% as regular tourists, and 4% were indecisive. One-way ANOVA tested the association between tourist type and ecotourism knowledge. Post hoc tests showed that ecotourists had significantly higher knowledge scores than regular tourists (mean difference = 0.54, $p = 0.008$) and indecisive visitors (mean difference = 1.18, $p = 0.022$). This finding demonstrates that tourist self-classification can play a significant role in shaping actions and attitudes toward ecotourism.

Willingness to Pay for Biodiversity Conservation and Factors Influencing Visitor Decisions

To estimate WTP for biodiversity protection at NNNP, visitors were presented with hypothetical scenarios in which the park was threatened by highway construction, agricultural expansion, invasive species, and other environmental changes. Conservation efforts, including public participation and financial contribution were described as urgently needed. Visitors were asked whether they would be willing to pay for biodiversity conservation. If so, a list of payment options was provided, starting from 20 Baht to 100 Baht, along with a blank space where respondents could write their own preferred amount if it differed from the list. Surprisingly, about 80% of the respondents expressed their WTP with 90% confidence. The average amount was 40 Baht, which is equivalent to the current entrance fee for Thai visitors. The most preferred payment method is through entrance fee collection (70%), followed by a donation box placed at the park visitor center and tour guide fee (29% and 1%, respectively). The outcome reflects visitors' preference and familiarity toward the existing payment method where their money contribution will be allocated for park management, including biodiversity conservation. On the other hand, any new payment tool, especially donation, takes time for visitors to accumulate their trust on it. Moreover, the main reasons for WTP included perceived effectiveness of conservation efforts and personal beliefs about the importance of protecting nature. Respondents who were unwilling to pay cited financial constraints as the primary reason. They also suggested that the entrance fee should already cover all necessary conservation costs. Lastly, respondents wanted their money to be allocated toward forest restoration, fire break construction, bird watching, and camping facilities, respectively.

Some factors were more influential than others in shaping WTP decisions. Logistic regression and a generalized linear model (GLM) were used to examine correlations between WTP decisions ("yes" vs. "no"), the amount of payment, and tourists' socioeconomic backgrounds. The decision to pay was significantly influenced by tourist type, perception of AHP status, and travel frequency. A GLM with a normal distribution and log link function was used to model the amount of WTP for biodiversity conservation at NNNP. The model fits the data well, with $\chi^2(13) = 47.028$, $p < 0.001$ and AIC = 2,093.099. Significant predictors (p -value < 0.05) of the WTP amount included: type of tourist (i.e., ecotourists expressed a greater amount, $B = 0.392$), gender (i.e., female visitors paid less, $B = -0.657$), travel frequency (i.e., frequent visitors > 5 times paid more, $B = 0.491$), age (i.e., older visitors paid more, $B = 0.023$), and perception on the AHP status (i.e., those who strongly agreed with the declaration paid more, $B = 0.467$).

CONCLUSION

Nature-based recreation, frequently thought of as ecotourism, is a key driver for biodiversity conservation at NNNP. Hiking, bird watching, and camping were the most popular outdoor activities at the park. Although visitors were confused about the meaning of ecotourism—particularly in reference to improving local livelihoods—they recognized their role in protecting biodiversity. Most visitors, especially those who identified as ecotourists; elderly; non-female groups; frequent visitors; and those who strongly agreed with AHP declaration of NNNP, expressed WTP for biodiversity conservation at NNNP (approximately 40 Baht) through entrance fee payments.

The AHP declaration was intended to enhance park management. However, most visitors were unaware of this international designation. Possible reasons include designation in 2023, limited promotion, and a weak connection perceived between the program and biodiversity protection. Yet, visitors quickly learned about the designation during the interview. Therefore, providing visitors with more information about the AHP program—especially its contributions to biodiversity conservation—is necessary. Increasing public awareness and engagement is essential for protecting biodiversity through ecotourism.

ACKNOWLEDGEMENTS

This work was supported by Khon Kaen University (KKU) through the KKU Scholarship for ASEAN and GMS Countries' Personnel for the Academic Year 2023 (No. 588/2023). We extend our appreciation to all the individuals who participated in our study, especially to tourists who visited NNNP. Their willingness to share their experiences and insights was essential for our data collection and analysis. We also thank the Integrated Land and Water Resource Management Research and Development Center in Northeast Thailand, Khon Kaen University, for their constructive input and for providing travel funding to attend the 16th ICERD in Japan. Lastly, we acknowledge Dr. Mark Morgan, School of Natural Resources, University of Missouri, for editing and improving the manuscript.

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