

How to Use Tourism to Support Sustainable Forest Management: A Case Study of the Pha Wang Nam Khiao - Pha Khao Phu Luang Forest Reserve, Thailand

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The primary objectives of this research focused on developing a sustainable tourism model for the Pha Wang Nam Khiao - Pha Khao Phu Luang Forest Reserve in order to sustain forest area and develop local community simultaneously. The sustainable tourism model was created based on site potential, stakeholders' opinions, and cost-benefit analysis. The results showed that the destinations were ranked in high potential for tourism development. The majority of tourists paid attention to forest resources education program and sport outdoor activities. Benefit-cost ratio (BCR) equaled to 1.81 and internal rate of return (IRR) equaled to 16.38, showing suitability and worthiness for developing tourism in Wang Nam Khiao forest reserve. Tourism development strategies have been proposed, including: (1) developing facilities and services for conservation and sustainable tourism; (2) personnel training for sustainable development; and (3) tourism marketing for niche market.

Keywords: tourism model, sustainable tourism, forest reserve, Thailand

Introduction

The national forest reserve is in the Thailand's protected area system which is reserved and managed for conservation and sustainable forest resource utilization. Under the National Forest Reserve Act (1964), the forest reserve in Thailand is designated forests used to denote forests accorded certain degrees of protection and assigns responsibility for their control and maintenance to Royal Forest Department of Thailand. The activities include hunting, grazing, land encroaching which are prohibited and banned unless specific orders are issued by the government. Presently (2017), there are 1,221 forest reserve areas collectively encompassing 231,268.8 sq. km or 45.07% of the country which the government controlled for production and extraction (Forest Land Management, 2017). From past to present, despite the law protection, deforestation continues in Thailand's forest reserve area. The primary cause is the increasing demand for agricultural area, forest products, and also residential development. Additionally, many forest reserve areas are surrounded by local villages leading to the problem of conversion of forest area for agricultural purposes and also illegal poaching. These activities have resulted in loss of biodiversity and major conflicts between local people and law enforcement agencies.

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Integrated conservation and community development approach is the goal of national forest reserve management (Salafsky & Wollenberg, 2000; Royal Forest Department, 2012). In this manner, appropriate tourism development can in fact be one of the most powerful tools for the forest reserve management with the expectation of conservation of the natural resources, while at the same time leading to increased benefits for local communities. Indeed, nature-based tourism, based on sustainable tourism concept, has often been viewed as the effective management strategy because this type of tourism is a non-consumptive activity that is regularly viewed as a win-win situation for conservation and sustainable development (especially economically sustain local communities and enhance the quality of life) (Naidoo & Adamowicz, 2005).

Additionally, nature-based tourism, which is growing rapidly, has emerged as one of the important issues for protected area management in Thailand. According to the number of visitors who visited national parks of Thailand, during 2012-2016, there were more than 10 million of visitors who travelled to national parks. In 2016, the national parks welcomed about 16.5 millions of visitors. Based on these figures, tourist arrivals in national park have increased approximately 13% annually (National Park, Wildlife and Plant Conservation Department, 2017). Demand for quality eco-tourism destinations will continue to grow as urban congestion, pollution, crowding, and concern for the natural environment all increase. In this manner, tourism in forest reserve, as intermediate tourism area, can reduce tension to tourism destination set in sensitive area such as national parks.

The primary objective of this research was to develop a sustainable tourism model for the Pha Wang Nam Khiao - Pha Khao Phu Luang Forest Reserve based on site potential, stakeholders' opinions, and cost-benefit analysis. The ultimate hope of this project was to create alternative strategy that could help to sustain forest area and develop local community simultaneously.

Methods

Case Study: Pha Wang Nam Khiao - Pha Khao Phu Luang Forest Reserve, Thailand

Pha Wang Nam Khiao - Pha Khao Phu Luang Forest Reserve is in Nakhon Ratchasima Province, the southern part of northeastern Thailand, covering the area of 1,061.05 km² and located 250 kilometers approximately from Bangkok. This forest area is covered by two major forest types: dry evergreen forest and dry dipterocarp forest. Average annual temperature is 26 degrees Celsius and average annual rainfall is 999.5 millimeters (Sakaerat Research Station, 2017). Additionally, this forest reserve is located on the major tourism route of the region and connected to many well-known tourism destinations, i.e., Khao Yai National Park.

The Pha Wang Nam Khiao - Pha Khao Phu Luang Forest Reserve is one of the important protected areas in Thailand, as the part of biosphere reserves. This forest area is surrounded by many villagers and agricultural fields, both legally and illegally. This area has faced with the problem about unsustainable natural resource utilization of local people - especially illegally use the forest for crop plantations, livestock, mushroom gathering, hunting, and tree cutting. In this manner, government and various organizations have attempted to develop tourism activity as the alternative management strategies to support sustainable development in the area and also help to distribute visitors from Khao Yai National Park, one of the most famous national parks in Thailand, to less crowded area.

Study Framework

The research for developing the sustainable tourism model for the Pha Wang Nam Khiao - Pha Khao Phu Luang Forest Reserve consists of three components: (1) the assessment of potential resources of tourism development; (2) the study of stakeholders' opinions toward tourism development in the forest area; and (3) a cost-benefit analysis for sustainable tourism development.

Assessing potential of the Wang Nam Khiao - Pha Khao Phu Luang Forest Reserve for sustainable tourism development. This part was aimed to quantify the development potential of tourism resources in Wang Nam Khiao and Pha Khao Phu Luang Forest Reserve. Four major destinations, including Wang Nam Khiao Forestry Student Training Station, Thab Lan National Park Protection Unit 4 - Khao Makha, Pak Thong Chai Forest Plantation - Forest Industry Organization, and Sakearat Silvicultural Research Station - Royal Forest Department, were selected based on on-site evaluation and the results of focus group meeting with key stakeholders, i.e., local government organization, community leaders, representatives from both government and tourism businesses.

To evaluate tourism potential of the selected destinations, a set of indicators and standards have been developed along the lines of the global sustainable tourism criteria (World Tourism Organization, 1997), ecotourism standard criteria (Department of Tourism - Thailand, 2015), the global sustainable tourism criteria for destinations (Global Sustainable Tourism Council, 2013), and the principle sustainable use of biodiversity (Convention of Biological Diversity, 2004). Sixteen indicators have been developed based on the core indicators of sustainable tourism development covering two aspects including: (1) potential and value of destination; and (2) tourism development potential. The indicators are as follows (see Table 1).

Table 1

Indicators Developed for Assessing Tourism Potential of the Wang Nam Khiao – Pha Khao Phu Luang Tourism Network

Indicators of potential and value of destinations	<ol style="list-style-type: none"> 1. Ecological uniqueness of the destination 2. The abundance of flora and fauna 3. Beautiful landscape and scenery 4. Identity and physical uniqueness of the destination 5. Attractiveness of tourism destination 6. The importance/value of destination to local people 7. Education opportunity/nature interpretation 8. Thermal comfort zone 9. Rainfall 10. The risk of environmental degradation from human activities 11. Soil erosion risk 12. Site resistance
Indicators of tourism development potential	<ol style="list-style-type: none"> 1. Recreation potential - diversity of recreation/tourism activities 2. Accessibility of destination 3. Safety 4. Tourism development opportunities from external factors

By the concept of ranking and scaling, Weighting Score Equation method has been used to calculate tourism resource potential.

Investigating stakeholders' opinions toward tourism development in the forest area. To study visitors' opinions toward tourism development in study area, visitor surveys involving 1,168 respondents were conducted at Khao Yai National Park, Thab Lan National Park, Khao Paeng Ma non-hunting area, and Wang Nam Khiao District - the popular tourist attractions located close to selected destinations. On-site surveys, in-depth interviews, visitor surveys involving some 1,168 respondents, and focus group meetings with key

informants were conducted to gather the required data. A questionnaire was used to collect data regarding travelling objectives, travelling needs, behaviors, desired recreational/tourism activities, and perception of tourism development in forest area.

Furthermore, this research also explored the impacts of tourism development in the communities through residents' perception, both social and environmental aspects. The questionnaires were distributed to 157 sample residents living in five local communities located along the forest edge. The sample residents were systematically and randomly sampled surveyed householders and purposively selected interviewed key informants.

Aside from questionnaire survey, in-depth interviews were conducted with various stakeholders, including the representative from selected sites - Wang Nam Khiao Forestry Student Training Station, Thab Lan National Park, Pak Thong Chai Forest Plantation, Sakearat Silvicultural Research Station - local government organization, community leaders, government and law enforcement agencies, representatives of private companies, community groups, tourism business, and NGOs. The in-depth interviews focused on the opinion, issues of concern, readiness and obstacles of tourism development. The data were qualitatively analyzed by content analysis and statistical descriptive analysis used to describe the basic features of the data in a study.

A cost-benefit analysis for sustainable tourism development. In the study of cost-benefit analysis, economists have developed various approaches in order to quantify values.

In this part, firstly, an economic analysis of the willingness to pay (WTP) for tourism development in Wang Nam Khiao - Pha Khao Phu Luang Forest Reserve was examined to access the economic benefits via the fee that tourists placed for the purpose of participating in recreational activities in study area. Secondly, based on WTP, a contingent valuation method (CVM) was investigated with double-bounded closed-ended questionnaires illustrating the WTP for sustainable tourism. CVM is a survey method in which the respondents are asked how much they are willing to pay for the use or conservation of natural goods. Their stated preferences are assumed to be contingent upon the alternative goods offering in a "hypothetical market". This research implements CVM. Thirdly, part of analysis the benefits and costs from tourism development in the study area, net present value (NPV) of developed tourism, BCR and IRR were identified for indicating the worthiness of the tourism investment in study area. NPV is a measurement of the present net profitability (expected benefit subtracts by expected cost of investment) over a period of time. BCR is the ratio identifying the relationship between possible benefits and costs of a proposed project. This ratio is calculated by dividing the total discounted value of the benefits by the total discounted value of the costs. IRR is the interest rate at which the NPV of all the cash flows from a project or investment equals zero (the interest rate that makes the NPV equal to zero).

Results and Discussion

Potential of the Wang Nam Khiao - Pha Khao Phu Luang Forest Reserve for Sustainable Tourism Development

Wang Nam Khiao - Pha Khao Phu Luang Forest Reserve is predominantly characterized by ecological and natural landscape features. Wang Nam Khiao Forestry Student Training Station is outstanding for presenting scientific research in forestry filed, such as silviculture, forest utilization, forest ecology, and dendrology. Thab Lan National Park is the second largest national park in Thailand and includes attractions such as Lan forest, Huai Yai Waterfall, Bo Thong Waterfall, SuanHom Waterfall, Khao Makha camping area, and many beautiful view points. This park is home to the rare species of palm named "Lan" (*Coryphalecomtei*). Deciduous dipterocarp forest, mixed deciduous forest, moist evergreen forest, and dry evergreen forest dominate most area

of the park. Its lush forest is home to many endangered animals and various birds. The park is part of the Dong Phrayayen-Khao Yai Forest Complex UNESCO World Heritage Site. Pak Thong Chai Forest Plantation is a good site to study agroforestry and how timber plantations can potentially support natural forest conservation and community development. Sakearat Silvicultural Research Station is famous for long-term restoration work, including reforestation, tree planting programs, and silviculture research. Figure 1 below presents major tourist spots and their predominant characters.

**Wang Nam Khiao Forestry Student Training Station,
Faculty of Forestry, Kasetsart University**



**Sakearat Silvicultural Research Station,
Royal Forest Department**



**Thap Lan National Park,
National Park, Wildlife and Plant Conservation Department**



**Pak Thong Chai Forest Plantation,
The Forest Industry Organization**



Figure 1. Major attractions in Wang Nam Khiao - Pha Khao Phu Luang Forest Reserve.

According to the set of indicators and standards for tourism potential, the results showed that the destinations were ranked in high potential for tourism development. Based on the major attractions and tourism resources of these destinations, tourism route was set themed “Forester’s Tale: Forest - For Life - For Future” objected to create the opportunity to learn and experience about forest resource and protected area management of Thailand for visitors via travelling and engaging in the activities in the tourism destinations. The recreational sport activities (bicycling and trail running) (see Figure 2) and ecotourism activities (hiking, bicycle, and nature study) were proposed.

Based on the results in this part, to support the goal of sustainability, conservation strategies including wildlife corridor and environmental education would be a priority consideration. Visitor uses will be prohibited during season when resources area is vulnerable to disturbance. Developing an impact monitoring system is also important. The development of infrastructure and services will be created in appropriate scale and does not alter the environmental conditions. Enhancing visitor experience of local community is necessary to support community development. Finally, participatory management is needed for sustainable tourism model of forest reserve area.



Figure 2. Bicycling and running trail proposed in Wang Nam Khiao - Pha Khao Phu Luang Forest Reserve.

Stakeholders' Opinions toward Tourism Development in the Forest Area

The 1,168 questionnaires with good quality and reliability can be further analyzed to draw a conclusion for the study. The survey sampled presented that the majority of the respondents were females (58.7%), aged between 18-29 years old (48.50%) and mostly single (63.40%). The majority of them held bachelor degrees or equivalent (76.20%), were private company employees and government officers (51.40%), with an average income between 10,000-20,000 Baht (about US \$280-US \$550) a month. The majority of the respondents was from Bangkok and the central part of the country (55.00%) and travelled in one-day (34.80%) and three days and two nights (33.60%) respectively. Most of them have gathered the information from the internet/website/social media (42.54%) and personal experience (24.37%). The respondents mostly travelled with their families (46.20%) with only 2-5 persons using their private cars and the frequency of last-year-traveling was up to 5 times per year.

The survey found that the major purposes of traveling of the visitors were relaxation (87.76%), spending time with family and friends (54.28%), escaping from routine life (41.44%), and discovering/seeing beautiful scenery or natural environment (41.35%). From the research findings, it could be interpreted that the majority of the tourists were traveling on mass tourism basis. The findings suggest that tourists visiting the Wang Nam Khiao - Khao Phu Luang National Reserve Forest prefer passive environmental related activities such as hiking and nature walks, photography, sightseeing. Additionally, one third of the respondents were interested in outdoor sport activities, i.e., biking and trail running.

The results showed that the plentiful natural resources and diversity of ecosystem are the most important factors attracting tourists to visit this forest reserve. The visitors recommended that, for sustainable tourism development, the tourism activity would be eco-friendly and concerned about environmental conservation. Furthermore, the responsible organization needs to be omniscient, professional, and able to take care of the tourist efficiently. For the accommodation development, the concept of eco-lodge should be applied. Moreover, the basic infrastructure for the disabled or elderly was needed since it would help the elderly and the disabled to travel easily and comfortably. Additionally, the transportation was such an important system that the route/road and the guidepost to the location need to be clear and accessible.

In part of local people's perception of the impacts of ecotourism development, the results presented that the respondents tended to strongly agree that tourism provides economic benefits to local community (increasing income, enhancing job opportunity, and reducing inequality in the distribution of income) and also results in better conservation of natural resources (decreasing of trespassing on national park property and increasing public awareness about environmental concern). On the negative side, the results reflected the perception of negative impacts of tourism development. The respondents tended to agree that tourism increases the cost of living for local residents. Additionally, they also expressed their concerns about garbage disposal and waste problems. The results in this part draw the concern about the level of development that should not exceed the carrying capacity of the local communities and also forest area.

The finding indicated that every part of stakeholders agreed with the development of tourism accompanied by giving a main reason to support the opinion of economic interest and quality of life development in its community. The community participation in the process of tourism development was also essential. The results confirmed that the shortage of manpower tourism management was a core problem; thus, to strengthen tourism development, the personal competency development for staff of local administrative organization according to tourism development is needed.

A Cost-Benefit Analysis for Sustainable Tourism Development in Forest Area

The results estimated that the WTP for tourism was between 250-1,000 Baht with arithmetic mean and median of 771.25 and 633.59 Baht per person respectively and the demand was between 58,747-141,543 persons per year. For more understanding, if the fee was calculated by median of WTP at the price of 650 Baht, the number of tourists who visited the study area would be 78,723 persons per year. In addition, the results confirmed that the demand of tourists depends on the fee. A higher fee structure for participating in recreational activities will hold down or reduce the demands (see Figure 3).

Apart from WTP, NPV of tourism development equaled to 238.71 million Baht. BCR equaled to 1.81. IRR equaled to 16.38. These indicators presented suitability and worthiness for tourism development in Wang Nam Khiao - Pha Khao Phu Luang Forest Reserve.

According to the results in this part, the research suggested that the tourism capacity should be reviewed in order to enhance its potential. Furthermore, indirect cost affecting local communities should be evaluated to estimate economic worthiness.

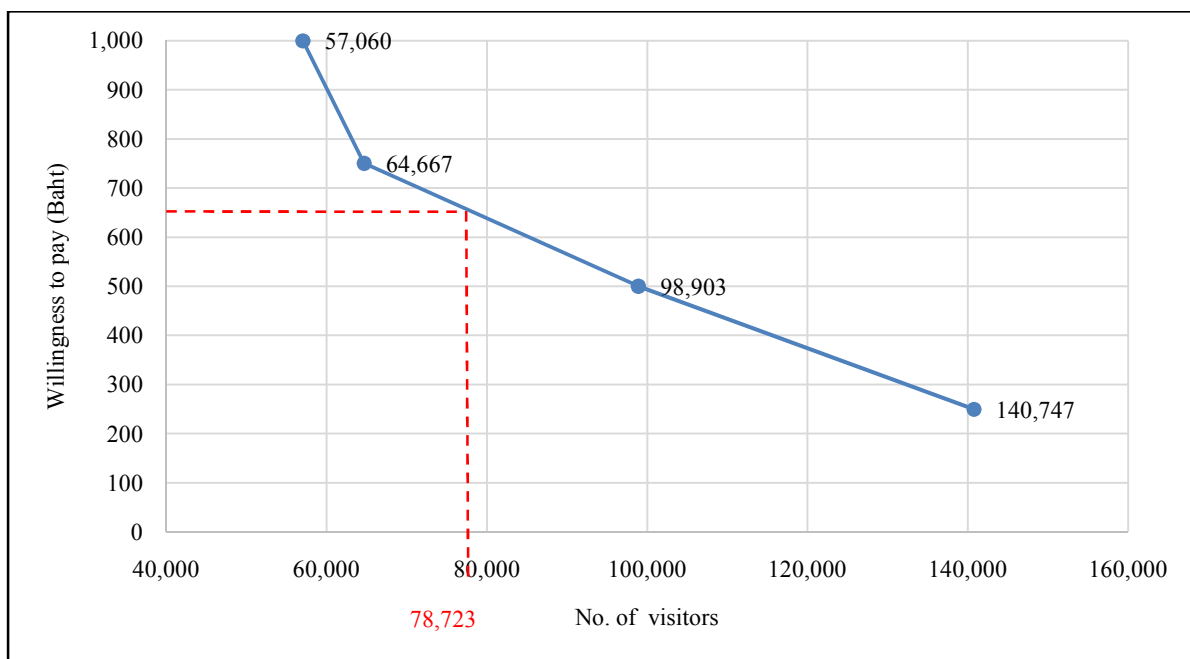


Figure 3. Forecasting tourism demand of Pha Wang Nam Khiao - Pha Khao Phu Luang Forest Reserve with different WTP.

Conclusion

The idea of developing a sustainable tourism model has been proposed for Pha Wang Nam Khiao - Pha Khao Phu Luang Forest Reserve management in order to create alternative strategy that could help to support sustainability of forest area and local community development. In the first step, tourism development potential of this forest area was analyzed. The results presented high potential for tourism development, based on both the potential and value of destinations and tourism development potential. Additionally, all parties have agreed that tourism could be a powerful tool to support community development and local well-being. Additionally, the indicators of worthy investment including NPV, BCR ratio, and IRR have confirmed the suitability and worthiness for developed tourism in Wang Nam Khiao Forest Reserve.

According to SWOT analysis of the development of sustainable tourism model for the Wang Nam Khiao Forest Reserve, the strategic plan for tourism development was proposed. This strategic plan comprised of five strategies including:

- (1) Promoting recreational sport activities, such as mountain biking and trail running, for adventure tourist;
- (2) Promoting ecotourism for forest education, including hiking trail for youth and families, dendrological nature trail, and nature trail for environmental education;
- (3) Developing facilities and services for conservation and sustainable tourism, i.e., landscape improvement, green facility development, wildlife corridor;
- (4) Personnel training for sustainable development;
- (5) Tourism marketing for niche market.

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