Original article

Indicator Development for Evaluating Wildlife Tourism Management in Thai National Parks

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ABSTRACT

The growth of wildlife tourism in Thai national parks has been well recognized and accompanied by concerns regarding its sustainability. This research developed indicators and evaluated the success of wildlife tourism management in three Thai National Parks: Khao Yai, Kuiburi, and Doi Inthanon. To develop the indicators, this study relied on literature reviews followed by a questionnaire survey to four target groups: park personnel, tourists, tour guides, and local leaders, and finished with an expert evaluation using the Delphi technique. The target groups ranked the importance of each indicator within a 5-point Likert scale from very low importance (0) to very high importance (5). A mean score of 3.41 or higher for an item was used as a cutoff for indicator selection from the results of the questionnaires and 4.20 or higher from the experts. The evaluation of wildlife tourism management using these indicators on each park was undertaken by the researcher, the national park superintendent, and a representative of NGOs working in the park. The study results revealed that there were 22 indicators in three groups: wildlife resources, tourism and visitor management, and institutional and managerial resources. The evaluation results of wildlife tourism management at Khao Yai, Kuiburi, and Doi Inthanon were rated as good management with scores of 1.94, 1.91 and 1.98 respectively, from a score range of 0 (need strong improvement in management) to 3 (very good management). For Khao Yai National Park, the least successful item was the interpretation program for tourist education and awareness raised (0.67), in Kuiburi and Doi Inthanon, it was the training of park personnel and nature guides on skill and knowledge in wildlife tourism (0.33 and 1.33, respectively).

Keywords: wildlife tourism, national park, indicators, Thailand

INTRODUCTION

Nature tourism in Thai national parks has been popular recently. In 2015 national parks received 12.98 million visitors (Department of National Parks, Wildlife and Plant Conservation, 2016). Wildlife tourism is part of that tourism growth in national parks. A main motivation of visitors coming to see wildlife in parks is that wildlife in a natural setting provides different experiences from watching them in a zoo. Major activities include bird watching, night wildlife watching, wildlife watching from towers or blinds, wildlife viewing, and safari tours. The growing demand has been accompanied by concerns regarding good management and sustainability because the interaction of visitors and wildlife can result in negative impacts on both the wildlife and visitors (Higginbottom, 2004). Recent incidents have indicated that wildlife such as elephants have attacked visitors and their property in Khao Yai National Park because tourists stressed the animals. Sometimes tourists get too close to the animals or disturb them for fun. Wildlife have also suffered from inappropriate human behavior such as feeding and handling the wildlife, and littering.

Sustainable tourism development has been recognized widely in Thailand since the promotion of Agenda 21 for the tourism industry. It has slowly changed the development paradigm of Thai policy on tourism use of natural resources. Ecotourism has been proposed at natural tourism sites including national parks to promote sustainable tourism. Even though there has been a gradual progress of tourism management in national parks, the park managers have not given their full attention to the management of wildlife tourism in particular. A lack of good management direction may impact negatively on wildlife as well as lower the quality of tourist experiences.

Indicators have been identified as an effective instrument to assess and monitor the progress towards sustainable development. World Tourism Organization (1996, 2004) stated that indicators are measures of the existence or severity of current and upcoming issues, risk and potential need for action, and the results of implementation. Indicators are information sets which are selected to measure changes that are important for tourism development and management. Both quantitative and qualitative information can be used for sustainability indicators. Wildlife tourism management framework and indicators should be established for monitoring the wildlife tourism situation for sustainability and guiding park management. Use of indicators can lead to actions to anticipate and prevent undesirable situations at tourism sites. Thus, this research developed indicators to measure the sustainability of wildlife tourism management in Khao Yai, Kuiburi, and Doi Inthanon National Parks.

MATERIALS AND METHODS

Study areas

Three national parks which have recently become very popular for wildlife tourism activity were selected as study sites: Khao Yai, Kuiburi, and Doi Inthanon National Parks. As part of a natural world heritage site, Khao Yai National Park is very well known for wildlife tourism particularly wildlife watching at night by truck and wildlife viewing of elephant (*Elephas maximus*), samba dear (*Cervus unicolor*), and gaur (*Bos gaurus*) in their natural habitat. Kuiburi is well known

for wildlife safaris with elephant and gaur being the main species of interest in wildlife viewing with local guides in an open, natural area. Lastly, Doi Inthanon is a special place for bird watching activity where the local wildlife watching club is a key for birding activity. Additional to this, goral (*Naemorhedus griseus*) has been frequently seen along the Kew Mae Pan trail and has become an additional attraction for visitors walking this trail.

Methods

1. Development of indicators for wildlife tourism management in national parks

The development of the indicators first relied on a review of relevant literature. Concepts of sustainable tourism and ecotourism were the guiding framework. The indicators were drafted and put into a questionnaire survey

for relevant target groups: park personnel, tourists, local leaders, and local tour guides in the study areas. The samples representing national park personnel were purposively selected including only those who had direct responsibility involving tourism in the park. Tourist sample size was estimated using the Yamane equation (Yamane, 1973) given e = 0.05 and using the tourist statistics for 2015 (Department of National Parks, Wildlife and Plant Conservation, 2016) as the population base for calculation. The samples of local leaders were selected from local communities of the sub-districts around the park. Finally, the samples of local guides were purposively selected including only those registered with the parks as local guides and who were on duty during the high tourist season from November 2013 to February 2014. The number of samples in each target group is shown in Table 1.

Table 1 Number of samples for questionnaire survey in study of wildlife tourism management indicators.

Number of samples in each target group for questionnaire survey	National Park			
	Khao Yai	Kuiburi	Doi Inthanon	Total
National park personnel	40	36	36	112
Tourists	400	400	400	1,200
Local leaders	36	48	10	94
Local guides	25	28	40	93

In the survey, respondents were asked to rank each indicator for its importance in contributing to the success of wildlife management in the national park according to a 5 point Likert scale, with ranking from very low importance to very high importance. The mean scores of the indicators and their groups of indicators were then calculated and classified into five classes:

Mean score of

1.00 – 1.80 = very low importance

1.81 – 2.60 = low importance

2.61 – 3.40 = moderately importance

3.41 – 4.20 = high importance

4.21 – 5.00 = very high importance

A mean score of 3.41 or higher for an indicator was used to select the first round of indicators.

Next, the Delphi technique was employed to seek experts' opinions on indicators. The snowball sampling technique was carried out to select the experts. By this technique, the names of experts in wildlife management and/ or wildlife tourism were identified by each expert until no new name was mentioned. In total, 30 experts were identified. Two rounds of an e-mailed questionnaire survey were sent asking their opinions on the appropriateness of the indicators and the rating of the importance. After the second round, indicators which received a wide range of scores from the experts (more than 0.25) were dropped out of the list. Then, the rating values of 4.21 or higher for an of indicator's mean score were included in the indicator selection.

2. Evaluation of wildlife tourism management in the national parks

Based on the indicators developed in the first part, the researcher attempted to evaluate the success of wildlife tourism management in Khao Yai, Kuiburi and Doi Inthanon National Parks. The weighted score method was employed. Each indicator was measured using a 4-point Likert scale from 0 to 3. Three evaluators-from a local NGO, a national park superintendent of the study site, and a researcher-were used in this process to make sure that a reliable evaluation was reached, reflecting the actual situation. The weighting score of each indicator from the experts' opinions was used as the importance value for each indicator in the second round of the Delphi technique. The evaluation score was then calculated and classified into four classes:

Mean score of

0.00-0.75	=	Not acceptable management level
0.76-1.50	=	Low management level
1.51-2.25	=	Good management level
2.26-3.00	=	Very good management level

RESULTS AND DISCUSSION

Indicator development

The indicators developed from the literature review (Eagles, 1993; World Tourism Organization, 1996 and 2004); Hawthorn *et al.*, 2000; Moscardo *et al.*, 2001; Eagles *et al.,* 2002; Higginbottom, 2004; Valentine and Birtles, 2004; Emphandhu, 2003 and 2009; Choi and Sirakaya, 2006; Nuthong, 2009) were initially grouped into seven components totaling 62 indicators.

The first group dealt with institutional management. Managerial resources are the key to success wildlife management. Leadership, good governance, good organization structure, qualified personnel, adequate budget, and good cooperation from outsiders as well as appropriate management tools such as laws and regulation (Jantowat *et al.*, 2011), clear policy and a management plan are identified as indicators for wildlife tourism management

The second group was tourism resources. Wildlife and the scenery of natural landscape in national parks contribute substantially to the success of wildlife tourism. Wild animals which are on IUCN conservation list such as tiger (Endangered, EN), Guar (Vulnerable, VU) and Rufous-necked Hornbill (*Aceros nipalensis*) (Endangered, EN) normally are attractive to ecotourists interested in a

conservation commitment while general tourists tend to be attracted to wild animals which are appealing, easily seen in their natural setting, or considered as iconic species such as elephant, guar, sambar deer, and great hornbill (*Buceros bicornis)*. The appearance of wild animals in a natural setting provides the most valuable experience for visitors and is considered a strong motivation for wildlife tourism.

Tourism services and facilities were the third group. The facility development concept focuses on green design that must harmonize with the natural environment, be environmentally friendly, and use local materials. The wildlife tourism services that should be provided in national parks are wildlife guiding tours and nature interpretation (Paisarn and Emphandhu, 2008) to educate and raise awareness in tourists as well as to enhance quality of tourism experiences.

The fourth group was the management of wildlife related to tourism. While wild animals are considered a strong motivation for most ecotourists, the conservation of wild animals and its habitat is much more important to them. Management must ensure that wildlife livelihood will not be threatened, which requires identifying the appropriate zone for tourism activity and determining tourism carry capacity, regulating tourist behavior, and specifying a visitor code of conduct. Necessary food and water management for wildlife such as making an artificial mineral lick can also help with regard to food security for wild animals and can also be used as a wildlife viewing point. An essential part of any wildlife

tourism management strategy is an interpretive program to educate and raise conservation awareness can prevent unacceptable tourist behavior such as feeding wildlife, getting too close to wild animals, and disturbing wildlife by any means.
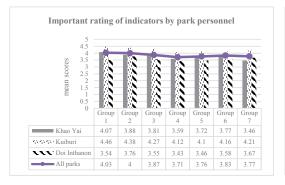
The fifth group was the management of wildlife threats from other human activities beside tourism. Wildlife habitat can be decreased as a result of large development projects and forest encroachment for farming and human settlement. Illegal wildlife hunting in protected areas is also a major threat to wildlife. Strong law enforcement and a good system of forest patrolling are needed to reduce these threats. If wildlife and its habitat are under pressure, as a consequence, wildlife tourism will likely put in jeopardy.

The sixth group was tourism and visitor management. Wildlife tourism gives importance to the quality of visitor experiences while controlling the tourism impact. Tourism activities must be designed to offer a memorable experience by selecting an appropriate tourism destination that offers fine natural settings and wildlife that can often be sighted. Nature interpretation must be included in the tourism activity to raise conservation awareness while visitors can enjoy the wildlife tourism experiences in natural settings. Finally, visitor safety measures must be a high concern. The commitment of nature guides and park officials on these issues plays a major role in the success of wildlife tourism.
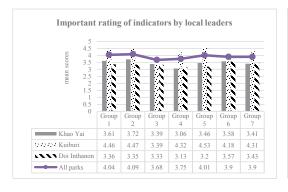
The final group was stakeholder participation. The local community plays a vital part in wildlife conservation and should be
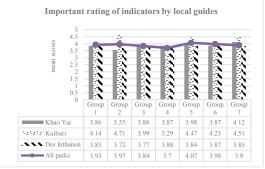
given an opportunity to participate in wildlife tourism through positions such as nature guides and other services. The supplementary income from tourism can in turn make local people realize the value of wildlife conservation. Emphandhu and Poolpiphat (2006) noted in their study that local people are a key factor for sustainable tourism in a national park.
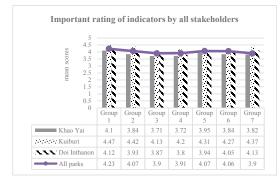
The results on the rating of the importance of indicator groups are summarized in Figure 1. Interestingly, park personnel and tourists gave the highest importance to the group of institutional and managerial resources while local leaders and local guides thought the most important groups contributing to the success of wildlife tourism were tourism resources and threats to wildlife and its habitat, respectively.

Important rating of indicators by park personnel

	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7
Khao Yai	4.07	3.88	3.81	3.59	3.72	3.77	3.46
Kuiburi	4.46	4.38	4.27	4.12	4.1	4.16	4.21
Doi Inthanon	3.54	3.76	3.55	3.43	3.46	3.58	3.67
All parks	4.03	4	3.87	3.71	3.76	3.83	3.77

Important rating of indicators by tourists

	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7
Khao Yai	4.15	3.86	3.72	3.78	4	3.87	3.86
Kuiburi	4.5	4.4	4.13	4.26	4.3	4.3	4.38
Doi Inthanon	4.22	3.98	3.92	3.85	4.01	4.13	4.22
All parks	4.29	4.08	3.93	3.96	4.1	4.1	4.15

Important rating of indicators by local leaders

	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7
Khao Yai	3.61	3.72	3.39	3.06	3.46	3.58	3.41
Kuiburi	4.46	4.47	3.39	4.32	4.53	4.18	4.31
Doi Inthanon	3.36	3.35	3.33	3.13	3.2	3.57	3.43
All parks	4.04	4.09	3.68	3.75	4.01	3.9	3.9

Important rating of indicators by local guides

	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7
Khao Yai	3.86	3.55	3.88	3.87	3.98	3.87	4.12
Kuiburi	4.14	4.71	3.99	3.29	4.47	4.23	4.51
Doi Inthanon	3.83	3.72	3.77	3.88	3.84	3.87	3.85
All parks	3.93	3.97	3.84	3.7	4.07	3.98	3.9

Important rating of indicators by all stakeholders

	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7
Khao Yai	4.1	3.84	3.71	3.72	3.95	3.84	3.82
Kuiburi	4.47	4.42	4.13	4.2	4.31	4.27	4.37
Doi Inthanon	4.12	3.93	3.87	3.8	3.94	4.05	4.13
All parks	4.23	4.07	3.9	3.91	4.07	4.06	3.9

Group 1	Institutional and managerial resources
Group 2	Tourism resources
Group 3	Tourism services and facilities
Group 4	Wildlife management
Group 5	Management of wildlife threats
Group 6	Tourism and visitor management
Group 7	Stakeholder participation

Figure 1 Average scores of importance rating of indicator groups contributing to the success of wildlife management in national parks by park personnel, tourists, local leaders, and local guides.

Looking in more detail, from the park personnel perspective it was found that the indicators which ranked at the very high importance level were the inscription of law and legislation for regulating wildlife tourism (mean importance value = 4.51), poaching (4.31), and law enforcement (4.21). These results clearly indicated that the park authority was concerned mostly with issues of wildlife resource protection.

From the tourist perspective, the indicators which ranked at the very high importance level were the inscription of law and legislation for regulating wildlife tourism (4.49), law enforcement (4.41), good quality personnel (4.31), poaching, (4.34), apparent responsibility of park personnel on wildlife tourism management (4.29), training for skills needed (4.29), encroachment (4.29), good cooperation among relevant agencies (4.27), unambiguous policy and guidelines to give clear management direction of wildlife tourism (4.24), and local community awareness of nature conservation (4.25). The results showed the tourists recognized that for wildlife tourism to be successful, resource protection and some management must be put into action.

From the local leader perspective, indicators which ranked at the very high importance level were poaching (4.48), encroachment (4.35), littering and pollution (4.34), law enforcement (4.24), and inscription of law and legislation for regulating wildlife tourism (4.23). From the local guide perspective, indicators which ranked at the very high importance level were inscription of law and legislation for regulating wildlife tourism (mean importance value = 4.29), law enforcement (4.31), nature guide (4.33), appropriate zoning for wildlife tourism in national parks and tourism use guideline (4.32), poaching (4.27), and safety measures (4.26). Generally speaking, both groups indicated high concerns for protection and management of wildlife resources as well as control of impacts and threats. At this point, all 62 indicators in the seven groups were selected for expert consideration in the Delphi process as the mean scores of all indicators were higher than 3.41 (perceived as high and very high importance).

The results from the expert opinion input on the appropriateness of indicators and the importance of indicators for measuring the success of wildlife tourism in the national park revealed 22 indicators were ranked as having very high importance for wildlife tourism performance in the parks. The seven groups of indicators were suggested to be reduced to three: wildlife resources, tourism and visitor management, and institutional and managerial resources (Table 2). Indicators ranked as having the highest importance in the list were the quality of personnel in wildlife tourism (4.90), followed by a tie between appropriate zoning for wildlife tourism in national parks and tourism impact control (4.83) while appropriate timing and season for wildlife watching activity (4.80) was third. The fourth ranked indicator was tourism carrying capacity to control amount of tourist (4.77) and the fifth consisted of several-illegal hunting, deforestation, tourist orientation, and information dissemination to visitors and the public (4.63).

Table 2 Weighed score of importance by experts' opinions and evaluation result of success of wildlife tourism management at Khao Yai, Kuiburi, and Doi Inthanon Parks.

Indicator	Weighed score of importance	National Park		
		Khao Yai	Kuiburi	Doi Inthanon
Wildlife resources				
1. Attractive and iconic wildlife species	4.43	3.00	3.00	2.67
2. Good landscape and appropriate natural setting	4.21	3.00	3.00	2.33
3. Nature trail for wildlife watching	4.37	2.67	0.67	2.00
4. Appropriate zoning for wildlife tourism	4.83	2.00	3.00	2.33
5. Illegal hunting	4.63	3.00	3.00	2.67
6. Deforestation	4.63	1.67	2.33	2.33
Tourism and visitor management				
7. Nature guides certified by the national park	4.23	2.00	3.00	2.67
8. Tourist orientation before wildlife tourism activity	4.63	2.33	1.67	2.67
9. Littering and pollution	4.30	2.67	2.67	2.33
10. Tourism impact control	4.83	2.33	2.33	2.00
11. Safety measures	4.40	2.33	2.67	2.67
12. Interpretation and nature education	4.37	0.67	1.00	2.00
13. Appropriate timing and season for wildlife watching activity	4.80	2.00	2.33	2.00
14. Interesting wildlife tourism program	4.27	2.33	2.00	2.33
15. Wildlife tourism information dissemination through several media	4.63	2.67	2.00	2.33
16. Determination of tourism carrying capacity and control of tourist number	4.77	1.67	2.33	1.67
17. Outreach program for local communities and other stakeholders to raise conservation awareness	4.33	1.33	2.33	1.67
Institutional and managerial resources				
18. Management plan for wildlife tourism and implementation indicators	4.37	2.33	0.67	2.00
19. Quality of personnel in wildlife tourism	4.90	2.67	2.00	2.33
20. Apparent organization structure corresponding to employee responsibility	4.30	2.33	1.67	2.00
21. Park officials and local guides training	4.50	1.00	0.33	1.33
22. Cooperation and active involvement of other relevant organizations and local communities	4.23	1.67	3.00	2.33
Evaluation mean score	-	1.94	1.91	1.98

Remarks: Evaluation mean score of   0.00-0.75 = Not acceptable management level
                                     0.76-1.50 = Low management level
                                     1.51-2.25 = Good management level
                                     2.26-3.00 = Very good management level

Evaluation results

When the indicators were used to evaluate the success of wildlife tourism management at Khao Yai, Kuiburi, and Doi Inthanon, it was found that all parks were ranked at the good management level. Doi Inthanon received the highest score (mean = 1.98) followed by Khao Yai (1.94) and Kuiburi (1.91). For Khao Yai National Park, the weakest point was interpretation (0.67) because Khao Yai did not have officially registered local guides. Most tourists participated in their own wildlife tourism activities; therefore, the interpretation program on wildlife and its habitat and conservation did not function well and was not embedded in the wildlife tourism activity. For Kuiburi, the management issues needing urgent improvement were training park officials and local guides on wildlife tourism (0.33), producing a management plan for wildlife tourism (0.67) as well as developing nature trails for wildlife watching (0.67). These points are consistent with the relative newness of Kuiburi with regard to wildlife tourism compared to Khao Yai and Doi Inthanon. Thus, some facilities and services as well as a management plan for guiding sustainable wildlife tourism were unquestionably needed further development. Doi Inthanon seemed to be the only park which did not have any serious issue regarding management. However, the lowest score there was for park personnel and local guide training on wildlife tourism (1.33); consequently, that park should take into these into consideration to improve park performance.

CONCLUSION

The development of indicators to measure the success of wildlife tourism management was carried out using a literature review, and survey questionnaires to several stakeholders and experts at Khao Yai, Kuiburi, and Doi Inthanon National Parks. This resulted in 22 indicators in three groups: wildlife resources, tourism and visitor management, and institutional and managerial resources. The evaluation results found that all three national parks were performing well in the overall results. However nevertheless, urgent improvements were needed in each park— a good interpretation program for Khao Yai, training of park officials and nature guides, a management plan for wildlife tourism, and nature trail development for Kuiburi, and training for park officials and nature guides for Doi Inthanon. Further development of the process should include indicators for evaluating output from the demand side, such the satisfaction of tourists and local people regarding wildlife tourism managed by the parks.

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