



Accommodation Design Criteria for Ecotourism and Natural Conservation in Doi Suthep Pui National Park, Chiang Mai, Thailand

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Abstract

In recent years, a new type of nature-based tourism has been gaining momentum. More tourists are seeking a new kind of tourism that provides them with the opportunity to escape the hustle and bustle of the modern world and enjoy the beauty and serenity of nature. This type of tourism is known as ecotourism. As the industry of ecotourism expands, well planned and ecologically sensitive facilities are in high demand, in fact they have become a necessity. So they demand high level research and design strategies for ecotourism accommodation and development. In this research accommodation required for ecotourism are viewed from architectural perspective so design and planning comes first in hand. Architecture of accommodation is accordingly affected by the culture, traditions and habits of the local people, and has evolved over time in correspondence to the behaviour and changes made in the surrounding environment. Chiang Mai city of Thailand has unique land of abundance of tourism resources such as natural and cultural, which can only be used properly through ecotourism. This research analyses the existing problems and proposes design criteria for the development of accommodation in Doi Suthep Pui National Park and in terms of ecotourism from architectural perspective. Ecotourism is introduced as a type of sustainable tourism in that its policies and principles for development are based on conservation of environmental heritage (including natural and cultural heritage) via engagement of local people and communities in the tourism development process. The role of an architect and his responsibility in this research should be to understand and interpret culture and to change society through a proper understanding of their identity and needs. To understand ecotourism problems, researcher use qualitative approach such as

reviewing of existing situation, tourist questionnaire and interviews. Doi Suthep Pui National Park is facing various problems such as falling number of tourist, lack of proper management from authorities, lack of architectural heritage management, manmade disasters and even forgetting true meaning of ecotourism. After a depth analysis of these issues researcher has pointed out some ways to solve the ecotourism and accommodation problems with the help of design guidelines also regarded as criteria. Criteria such as use of energy efficient building materials and techniques, use ecofriendly ways to save water, appropriate use of land, conserving ecology, proper waste management, conserving local architectural heritage and proper involvement of local people. Proposed criteria can be used for the future development of accommodation at host destination in terms of developing sustainable ecotourism, architecture and built environment. These guidelines can be used by architect, planners, policy makers, eco tourist and local people to develop a new model or sustainable environment for ecotourism.

Key words: Ecotourism, Natural Conservation, Accommodation, Design Criteria

Abbreviation: DSPNP - Doi Suthep Pui National Park

1. Introduction

1.1 Background

Tourism is about people and landscapes, the locations which one group of people leave, visit and pass through, the other groups who make their trips and those groups they meet along the way. It is prone to continue developing in the future because more people seek opportunities for leisure and recreation away from their surroundings. Ecotourism is a type of a tourism industry based on 'nature-based' travel to relatively undisturbed areas with an emphasis on education which could be a promoter for socio economic growth of intermediate cities. Tourism has been a major phenomenon of different societies from a long time. The tourism industry is currently growing as the world's largest and most diverse business sector since it serves as a primary source for generating revenue, employment, private sector growth, and infrastructure development for many countries. Researchers have argued that tourism development not only stimulates the growth of the industry, but also triggers overall economic growth (Lee & Chang 2008). Hence, enhancing economic growth by



promoting the tourism industry has become an important economic development strategy in most developing countries (Chen & Chiou-Wei 2009).

In the past decade, the tourism industry in Thailand has demonstrated two seemingly contradictory trends. On the one hand, rising demand for conventional tourist services and experiences has led to an enormous increase in the number of international tourist arrivals, from 9.5 million in 2000 to 22.4 million in 2012 (Tourism Authority of Thailand TAT 2013). On the other hand, since the early 2000s, demand has grown for alternative tourism experiences, including volunteer tourism (Mostafanezhad 2013), wildlife tourism (Duffy 2013), and ecotourism (Walter & Reimer 2012). These two may at first appear incongruous, but they are in fact related in that alternative tourism is a response, and proposed antidote, to the many harmful social and environmental costs associated with mass tourism in Thailand. Further, rather than existing entirely outside the realm of conventional tourism, companies in Thailand that offer novel, individualized, and small-scale experiences must often tap into mass tourism markets and marketing channels to succeed (Weaver 2002).

Thailand is a country with tremendous diversity and has a lot to offer in terms of ecotourism and related activities. In other words, heritage site, cultural attractions, rivers, hills, mountains, flora, fauna, and herbs provides a huge potential for the tourism sector. Ecotourism entails the sustainable preservation of a naturally endowed region. This is becoming more and more significant for the ecological development of all regions that have touristic values. From wildlife viewing, to wilderness camps, hiking vacations and white-water rafting, world's ecotourism industry is flourishing. For tourists visiting Thailand from other countries, alternative forms of tourism are appealing not only because they offer novelty, but also because they help to alleviate the apprehension or guilt that some visitors feel when reflecting on or learning about the problems created by the influx of international tourists. However, the most important reason for the growing demand for experiences such as ecotourism and volunteer tourism is a desire among international visitors to interact with Thai people and Thai natural environments in more authentic ways. By providing tourists with a glimpse into facets of Thai life concealed from the majority of package tourists, alternative tourism experiences promise a certain level of authenticity. Since mass tourism is widely, albeit simplistically, perceived to destroy the cultural and natural authenticity of a destination, Travellers hoping for an authentic vacation in Thailand have therefore turned

increasingly to the various alternatives made available in the past decade or so. While there is little doubt that international tourism has made great contributions to the Thai economy, or that international tourists have brought about longlasting changes to the lives of many Thais working directly in the tourism industry, it is important not to underestimate the significance of domestic tourism in Thailand, which in scope, impact, size, and implications is more important than tourism related only to international visitors (Kaosa-Ard, Bezic & White 2001). With rising incomes, improved infrastructure, and exposure to tourism marketing, Thais now travel in much greater numbers and with greater frequency than in the past. Though international tourists are more concentrated and visible in certain well-known locations, Thais account for approximately 80% of all tourist trips in Thailand, as well as 45% of total tourism revenues (Suansri & Richards 2013, p. 529).

Year	Tourists	% Change
2015	29,881,091	+20.44%
2014	24,809,683	-6.54%
2013	26,546,725	+18.8%
2012	22,353,903	+15.98%
2011	19,230,470	+20.67%
2010	15,936,400	+12.63%
2009	14,149,841	-2.98%
2008	14,584,220	+0.83%
2007	14,464,228	+4.65%
2006	13,821,802	+20.01%
2005	11,516,936	-

Table 1. Tourists arrival in Thailand and percentage of change in number (TAT 2015) .

Year	Tourists	% Change
2015	285915	+28.97%
2014	221689	+1.79%
2013	217783	-31.32%
2012	317144	+25.72%
2011	252260	-14.88%
2010	296374	-57.81%
2009	702522	-23.59%
2008	919461	-41.17%
2007	1562962	-18.63%
2006	1920923	-1.80%
2005	1956274	-

Table 2. Number of visitors in Doi Suthep Pui National Park (DNP 2015)



From the data above it is very clear that total number of tourist travelling in Thailand is increasing every year from 2005 to 2015 but tourist in DSPNP is decreasing every year from 19,56274 in 2005 to 285,915 in 2015. Almost number is decreased in the rate of 70% in 10 years. It's falling down every year from 2005. Ratio of Thai and international tourist is 3:1 from every survey. So main investigation here is to find how and why visitor population is dropping? What are the problems?

Ecotourism: According to (The Ecotourism Society 1991a, b) Ecotourism is about uniting conservation, communities, and sustainable travel. Ross & Wall (1999) believed that ecotourism is consistently deemed to be beyond tourism to natural areas. The World Conservation Union's Commission on National Parks and Protected Areas (1991) suggested that ecotourism is environmentally answerable travel and travel to untouched natural areas. Fennell (1999) noted that ecotourism is a sustainable form of natural resource-based tourism that highlights primarily experiencing and learning about nature, and which is ethically managed to be low-effect, non-consumptive, and locally oriented in control, benefits and scale. It typically takes place in natural boundaries, and should make a major contribution to conservation or preservation in those locations. Wallace & Pierce (1996), suggest that true ecotourism can be addressed in the following six principles.

- a. Ecotourism entails a type of use that minimizes negative impacts to the environment and to local people.
- b. Ecotourism increases the awareness and understanding of an area's natural and cultural systems and the subsequent involvement of visitors in issues affecting those systems.
- c. Ecotourism contributes to the conservation and management of legally protected and other natural areas.
- d. Ecotourism maximizes the early and long-term participation of local people in the decision making process that determines the kind and amount of tourism that should occur.
- e. Ecotourism directs economic and other benefits to local people that complement rather than overwhelm or replace traditional practices (farming, fishing, social systems, etc.)

- f. Ecotourism provides special opportunities for local people and nature tourism employees to utilize and visit natural areas and learn more about the wonders that other visitors come to see.

Natural Conservation: Natural conservation is the protection, maintenance, management, sustainable use, restoration and enhancement of the existing in, or formed by nature, nonurban; also incorporates cultural aspects. And also is the wise management and utilization of natural renewable resources in a sustainable manner to ensure the maintenance of biodiversity. (Wearing & Neil 2009). Nature Conservation is the wise management and utilization of natural renewable resources in a sustainable manner to ensure the maintenance of biodiversity.

Accommodation: Accommodations are the place of stay for tourist in terms of ecotourism. Ecotourism accommodation is small scale and locally owned however some larger scale developments have adopted a sustainable attitude are working to rehabilitate their site or the surrounding land. According to (Beeton 1998) accommodation which is sustainable and green should tend to reflect character of the region by utilizing historic buildings or precincts, focusing on farm stays in rural farming districts, wilderness lodges near national parks, seaside cottages in fishing villages and so on. Due to dispersed nature of areas of interest to eco tourists, accommodation need not to be clustered around major attractions. Spreading the accommodation also spreads the benefits and minimizes the impacts. Employment opportunities for the local community are a central part of green accommodation, particularly in the ecotourism context, as well as providing other economic opportunities for the local community such as purchasing local goods and services. Example of accommodation for ecotourism are a. Campsites b. Homestay c. Eco lodge d. Eco resort complex

Design Criteria: According to (Ecotourism Society of Ireland) it also can be interpreted as ecological best practice guidelines for construction and refurbishment of dwellings. The aim of the standard or those guidelines is to establish sustainable criteria for design, construction and travel for tourism infrastructure. To put ecological design and construction into perspective, it must determine sustainability. This is a word often used and misused and there are many definitions. One that is widely used is that adopted by the Bruntland Commission “the ability to satisfy our basic needs without prejudicing the ability



of future generations to do the same”. This suggests that we must use our resources efficiently. Thus the houses that we design, build and renovate should respond accordingly and last for future generations. The criteria for design and construction will be based on following

- a. Energy use
- b. Transportation
- c. Materials
- d. Water
- e. Land use and ecology
- f. Health
- g. Pollution
- h. Sustainable Technology
- i. Accreditation

1.2 Statement of the problem

The major purpose of the study is to develop design criteria and analysing the problem of ecotourism in Doi Suthep Pui National Park. The main investigation of research is into determining factors is on how and why we need the bond between ecosystem and ecotourism. Does it consist of culture and society integration? Or is it nature preservation? What is the new relationship between tourist-community or tourist development design and development of this relationship? How accommodation plays vital role in enhancing ecotourism? It is important to preserve the environment for a number of reasons. The forests are the habitat of numerous wild animals and destruction of the forests destroys this balance. Also, the forests act as catchment areas for rivers. Therefore, the rivers would dry up when we destroy the forests and ultimately flora and fauna disappears. Mass tourism increases the density of people in tourist area and degrades the quality of surrounding environment, increases pollution without considering the requirements and needs of the local people. So ecotourism should be adopted to protect the environment, local cultural identity and to increase social awareness. Eco-tourism can be both an effective conservation tool and a successful community development model in Thailand or any part of the world.

1.3 Significance of the study

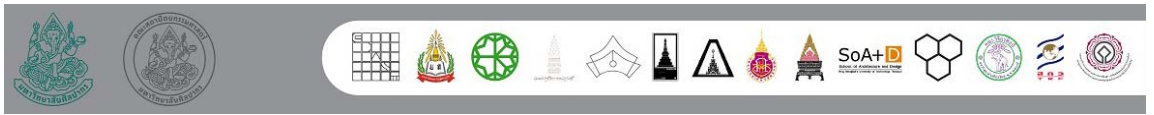
Ecotourism typically involves travel to destinations where flora, fauna, and cultural heritage are the primary attractions. One of the goals of ecotourism is to offer tourists insight into the impact of human beings on the environment, and to foster a greater appreciation of our natural habitats. Responsible ecotourism includes programs that minimize the negative aspects of conventional tourism on the environment and enhance the cultural integrity of the local people. Therefore, in addition to evaluating environmental and cultural factors, an integral part of ecotourism is the promotion of recycling, energy efficiency, water conservation, and creation of economic opportunities for local communities. For these reasons, ecotourism often appeals to environmental and social responsibility advocates. Massive mountains, rolling hills, abundant vegetation and diverse wildlife is the main attraction.

As the industry of ecotourism expands, well planned and ecologically sensitive facilities are in high demand, in fact they have become a necessity, and this demand can be met with ecotourism accommodations. Accommodation is a very important part of the tourism infrastructure and development of tourism is a function of accommodation. It creates a home away from home for the tourist. Accommodation is the largest and arguably the most important sub-sector of the tourism industry. It is large and highly diverse. Together with the transport industry, accommodation industry caters for international tourists, regional tourists and national tourists as well as locally based tourists. In a way, it meets the needs of virtually all tourism market groups. The rapid change within this sector of tourism does not only bring fierce competition, but it also brings about new products and new services standards. Accommodation and tourism business can bring a lot of income to the country, creating a job opportunity for many people and decentralize income and prosperity to the rural area therefore this study emphasis on accommodation for ecotourism.

1.4 Objectives of the Study

a. To analyze site history, formation, architecture, factors effecting ecotourism and its problem on accommodation.

b. To study the sustainable development of accommodation for ecotourism and natural conservation



c. To develop design criteria for accommodation for ecotourism and natural conservation

1.5 Study Area: Doi Suthep Pui National Park

Doi Suthep Pui National park includes not only the rich natural resources of plants, wildlife and spectacular landscapes, but also cultural resources featuring the interesting lifestyle of the hill tribe peoples and the Thai Lanna culture (Liorungruang & Munangyai 2007). The special natural and cultural features led to the establishment of the Doi Suthep Pui National park on April 14, 1981. The park covers 261.06 square km in the Mueang, Hang Dong, Mae Rim and Mae Taeng districts of Chiang Mai Province. Doi Suthep-Pui National Park study area covers Doi Suthep and Doi Pui mountain ranges which are dominated on the west part of Chiang Mai city.

Topography and climate:

Many of the highest mountains of Doi Suthep Pui National Park are in the Thanon Thongchai Mountain Range and are considered foothills of the Himalayan Mountain Range. The mountains range between 330-1685 m above the mean sea level, providing an environment that is high in biodiversity as well as being relatively cool and wet. The national park is composed of high cliffs and mountainous forest along with several rivers, streams and basins providing water for use and consumption for the Chiang Mai city. Because of the high altitude, the weather on the upper slopes of the mountain ranges is cool and pleasant all year even in hot season. An average temperature is about 20-23°C. In cool season, the temperature can drop to 6°C in February. August and September are the wettest months with daily rain.

Natural habitat:

At the highest elevations, the mountains are mostly covered in mountain rain forest that supports a dense growth of winter plants. Lower mountainous areas experienced by dry weather in the summer and have dry dipterocarp forest cover. At mid-level elevations, the mountains have thicker soil, experience more rainfall and are covered by mix deciduous and dry evergreen forest. Additionally, there are some palm forest stands that are found at high elevations where the weather is cold and soil is sandy. The five forest types found in this park create a perfect habitat for wildlife specially birds. There are 360 bird species found including residents and visitor species that migrate in the winter from Siberia and Northern

China. Other wildlife found in the park includes 31 mammals, 31 reptiles and 18 amphibian species

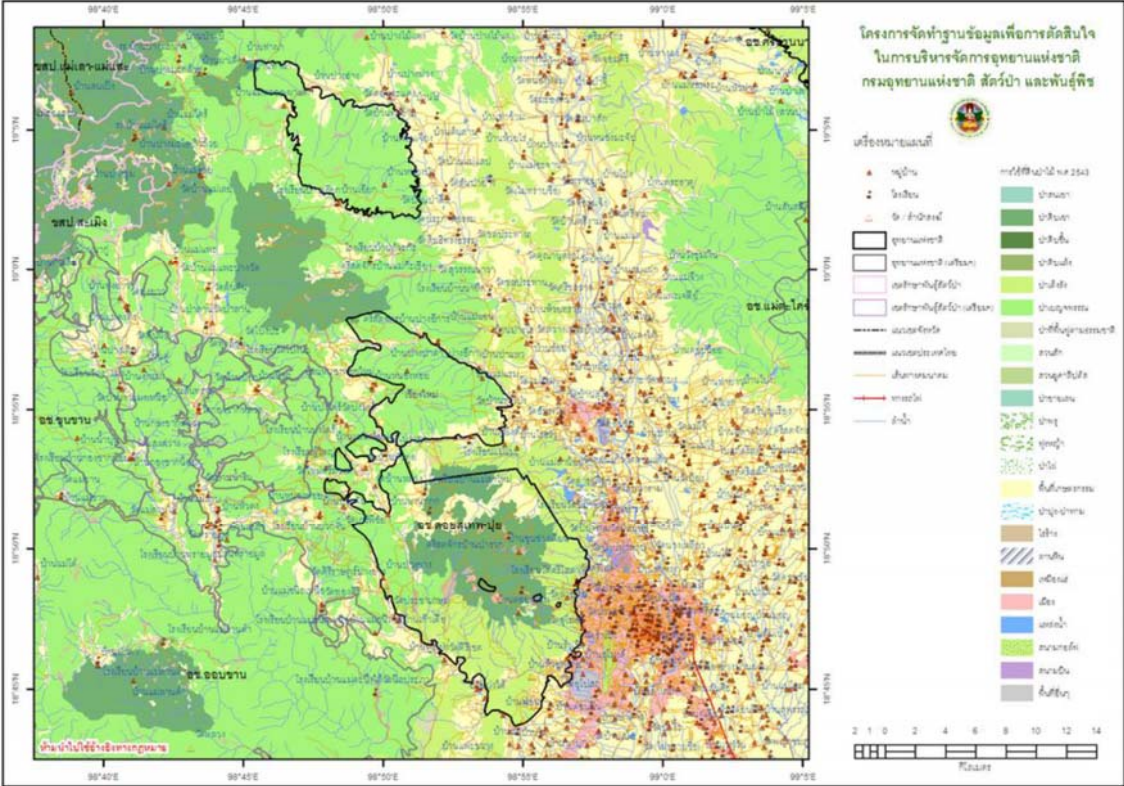


Figure 1: Map of Doi Suthep Pui National Park Chiang Mai, Thailand (DNP 2015)

3. Methodology

When conducting a research, it is important to identify the framework for the study. Here, the researcher used quantitative as well as qualitative research approach to conduct this research. This research is based on interpretive paradigm. Therefore, it relies heavily on naturalistic methods such as interviewing and observation and analysis of existing context. Study began with reviewing of existing plan of DSPNP for determination of its tourist capacity, its characteristics, potential for ecotourism, laws and regulations, its culture, history and rituals, architectural background and other aspect of tourism. After getting required information from reviews researcher started site visiting as a second step. It was done for knowing the existing situation of accommodation such as camp ground, lodges, and homestay in DSPNP. Also for gathering information about ecotourism activities such as bird watching, mountain biking, trekking, camping, religious studying and recreation inside the

study area. Site survey also helped researcher to understand detailed history, culture, architecture and built environment of DSPNP. It also gave information about building type, building size, building materials, construction technologies, building uses and how people used accommodation site for ecotourism activities like recreation, adventure, relaxation and natural observation. After site survey questionnaires were created with help of advisor and professors.

For sample collection, Yamane's (1970) calculation was used to find number of tourist visited DSPNP in recent 10 years. 200 set of questionnaire were set up regarding the existing problems of ecotourism and their correlation with built structure i.e. accommodation. Among 200, 50 were international and 150 were Thai visitors. Questionnaires were made easy to understand and answer by giving a few options to choose or in a Likert Scale. Answers from questionnaires helped researcher to understand the problems of accommodation in DSPNP. Questionnaires were mainly divided into 4 parts, which gave the answer about

- a. About personnel information
- b. The built environment and its relationship with ecotourism activities
- c. Their opinion on built environment, accommodation, activities and its problem d. Their satisfaction on built structures like resort, campsites, homestay and attraction points

Next step in research is interviews, which is done contrary to ordinary plans. Interviews is done both to single and group to back up the research. Interviews concentrates to criterion on design and tries to find relations between research topics. Interviews are mainly written down and recorded, out counting few ones, straight after the occasion. Interviewing will mainly focus on correlation between ecotourism accommodation, architecture and built environment. Interviews will be with

- a. Policy Makers (national park officer, tourism officer, provincial governor) 3 numbers
- b. Designers who design ecotourism accommodation and built environment (architects, planners, designers) 3 numbers
- c. Tourists during questionnaire 5 numbers
- d. Local people and accommodation owners 5 numbers



After collecting necessary information from Site visiting, Survey, Questionnaires and Interviews, factors affecting development of accommodation is determined and main factors are noted. Those factors are now regarded as a guiding principle for developing design criteria. Which will give a guideline or concept for future development. With the help of those criteria researcher will prepare a typical concept site plan for accommodation by randomly selecting area from DSPNP.

This study was basically conducted based on both primary and secondary data from previous studies, case studies, field survey, questionnaires and interviews. The aim of the study was to explore the interaction between the ecological, cultural and economic characteristics of ecotourism and its related products and activities such as architecture and sustainable built environment. Both qualitative and quantitative method were used for data analysis. Those data were analysed using different graphic methods and descriptive writing. For knowing and reviewing the maps, drawings and photos were used. For quantitative data like number of tourist, villagers, built structures and accommodation using different statistics such as percent, mean, frequency, chart, bar diagram and graph. IBM SPSS was used to analyse quantitative data from questionnaire and Microsoft Excel was used for describing extracted data in bar and graph. Thematic analysis method was chosen because of different types of data and material such as maps, questionnaires and interviews. Site Survey Questionnaires Interviews Data Analysis

4. Discussion

Finding 1: The primary purpose of this study was to analyse site history, formation, architecture, factors effecting ecotourism and its problem on accommodation. The researcher has applied four data analysis methods to study the research issues. As a result of field survey and analysis, researcher is able to identify the exact information in-depth. DSPNP is located on north east of Chiang Mai city and almost cool throughout the whole year if compared to other places and cities Thailand. Doi Suthep Mountain is the third highest mountain in Thailand. Due to which cool weather and natural heritage supports ecotourism in DSPNP. Most of people travel in DSPNP to enjoy nature, hike, trek, enjoy

waterfalls and to visit Doi Suthep temple, which is located at the top of Suthep Mountain. Being home of very rich natural and cultural heritage, it is also very near from city so people visit DSPNP in vacation to enjoy the natural environment away from busy life. DSPNP has a lot of things to offer for ecotourism such as rich natural landscapes, waterfalls temples, trekking route and two beautiful Hmong village. Waterfalls and campsites are the two best destination for tourists who are seeking for natural attraction and temples and villages for tourist who are seeking cultural attraction. Some of the place are also for adventure travellers and some for environment researcher and students. DSPNP is different from other place in Thailand because of its location and its unique cultural identity. The temple and most of the houses are inspired from Thai Lanna architecture but houses in villages are vernacular and holds unique lifestyle of local people. Ecotourism always focus on culture and tradition of the local people, conserving heritage and giving back to local people who are the default users. DSPNP is managed by department of national park Thailand so most of the area is protected under the laws of protected area of Thailand. Conservation of temples, forest and animals is mandatory. Even size of the village is limited to prevent deforestation and controlled land use. So the number of houses inside villages is constant. Another main reason to conserve DSPNP is the Bhubing Palace, which holds history of Royal family from a very long time, so it can be said that DSPNP is a best choice for tourists who are seeking for ecotourism. Talking about accommodation in DSPNP, there are only four places to stay. There are two campsites one located near Doi Pui Mountain and another located near Monthathan waterfall. Only one homestay is located inside Khun Chiang Khian village and another Eco lodge or national park accommodation near Doi Suthep temple. Beside these there was another homestay inside Doi Pui village but forced to shut down because of no maintenance and falling number of tourist. Campsites and Eco lodge are in very good conditions but Homestay has a very low maintenance. The bigger campsite can hold only 300 people per night in high season, so as 150 people by small campsite of Monthathan. January to March is the highest season and June to August is the lowest season. In the highest season all accommodations are full along with Eco lodge and Homestay so tourist is bound to return back to Chiang Mai city for staying at night. That is why tourist in DSPNP is decreasing every year. Price of tent for night stay is 250 B., and rooms ranging from 400 to 1500 B per night considering the size of the room. Rooms at national park accommodation are available in every season but need to be booked in

advance online. May to July the climate in DSPNP is very hot so people don't like to go there rather they stay in Chiang Mai city. Visitors prefer to stay at Doi Pui campsite because ecotourism activities like camping, cycling, bird watching, observation of plant and birds and hiking are very famous in there. The campsite provides facilities such as tents, food, parking, information counters, exhibition and picnic arrangement but they don't have indoor lodging and health facilities. The campsite is managed by national park and during high season nearby authorities and organization from village come to help along with police. The campsite has supporting elements such as 4 view decks, fireplaces and coffee shop. They also have solar plant installed but they don't use it because of lack of maintenance. They collect waste every day and send them to another location near Doi Suthep Temple because they don't have their own system to manage waste. They only have trash cans which are placed in different location of campsite.



Figure 2&3: Doi Pui Campsite fireplace photo taken by Pradip Pokharel on 2015-09-30

Khun Chang Khian Homestay is located inside the Hmong Village 5 km away from Doi Pui Campsite. The owner of homestay is one of the local people. It has 15 bedrooms with outdoor sitting area, combined bathroom and sauna. The total capacity of homestay is 30 people but during low season only 1 or 2 per day or sometimes in month. The basic cost of stay is 500 per room per night. They also provide food for the tourist but first they need to confirm such as number of people and type of food but they don't have cooking space inside the homestay. They have space for fireplace and barbeque where tourist can enjoy night time. Talking about the services, they don't have parking space, they don't have information counters and picnic arrangement but hey have toilet, electricity and drinking

water supply. They have ecotourism and recreational activities such as guided tours and ethnic group dance show, where they display cultural dress, dance and lifestyle of Hmong people. One of the specialty of the homestay is clay made sauna, where tourist can enjoy hot bath during winter. National park doesn't authorise homestay in DSPNP but this homestay is owned by local people and he used his house as a homestay. Homestay during low season seen not managed and was not in a good condition.



Figure 4&5: Homestay and Sauna photo taken by Pradip Pokharel on 2015-09-30

National Park Accommodation, which is located near Phrathat Doi Suthep temple. This accommodation is owned by national park and has bungalows, campsites and meeting halls. Total capacity of accommodation is 120 people per night in bungalows, 100 people in camp ground and 400 people in two meeting halls.

Bungalows Room Number	Person	Price	Note
101	8	2500	Bungalow
102/1	4	1500	Bungalow
102/2	4	1500	Bungalow
103	8	2500	Bungalow
105	6	2500	Bungalow
106	10	3000	Bungalow
107	6	2500	Bungalow
108/1	20	2500	Bungalow
108/2	20	2500	Bungalow
109	8	2000	Bungalow
110/1 to 110/5	2	400	Separated Room
110/6 to 110/7	4	500	Separated Room
110/8	15	1500	Separated Toilet
Camp ground	100	-	-
Meeting halls	400	-	-

Table 3: Capacity and price of room at DSPNP accommodation (DNP 2015)

Tent is not provided in the area so to do camping tourist need to bring their tents by themselves. Accommodation has restaurant to serve local food. Along with parking facilities there is an information counters and picnic arrangement for tourist but no health services and medical centres nearby. Basic service elements such as electricity, toilet, drinking water and sewer is present but no fire pits outside instead they have fireplace inside bungalows. Television and refrigerator are not allowed to use in accommodation because they want tourist to enjoy the nature rather than television. For ecotourism activities related to education and training, tourist most come with their proposal and accommodation can allow to use it. Phrathat Doi Suthep temple and Bhubing Palace are the key attraction points nearby the accommodation and cycling, hiking, natural observation and relaxation are the main ecotourism activities. To book rooms in this accommodation visitors need to book it through online booking, which is managed by national park itself.



Figure 6&7: National park accommodation photo taken by Pradip Pokharel on 2015-09-30

Monthathan waterfall campsite and accommodation, which is 10 km away from Chiang Mai University. The area consists of 2 campsites, 2 rental houses, Monthathan waterfall and trekking trail. The total capacity of campsite is 150 persons per night. The price of rental house is 1500 B for 6 persons. Price of tents and sleeping bags for the campers is provided, which cost 225 B for 3 people and if tourist bring their own tents then cost will be only 30 baht. This accommodation is organized and managed by Monthathan Waterfall Organization from the permission of DSPNP. They provide tents, lodging, parking, information

counters, health centre and place for enjoying picnic. Basic facilities such as road, parking electricity, toilet is present. Activities for ecotourism such as enjoying waterfalls, bird watching, cycling and trekking are famous. The specialties of this place are waterfall observation, butterflies and mushroom observation. The nearby attraction from this place is Huay Kaew waterfall which is very close to Chiang Mai Zoo.



Figure 8&9: Monthathan house and Campsite photo taken by Pradip Pokharel on 2015-09-30

Finding 2: Next issue of the research is to find out way of harmony between ecotourism development and accommodation i.e. it is in sustainable way or not. For this researcher used questionnaires method to gather in depth problem of existing accommodation. As a result, researcher is able to identify problems of accommodation and issues on ecotourism. It also explains tourist satisfaction about the accommodation and their reaction towards future development. From the 200 set questionnaires 50 international and 150 Thai most of traveller are male and their age is less than 30 because these age group seeks adventure, wilderness and ecotourism. Tourist travelling in DSPNP mostly use Thai as their first language and English as their second language followed by Chinese and Japanese and they are already graduated from universities. Mostly single people and whose earning is less than 50000 B like to travel DSPNP because they travel with friends and spend only 500 B per day for travelling, lodging and food. Tourist choose DSPNP to stay because of its good location and ecotourism activities for 1 to 3 days. Most of the tourist like to stay in cheap accommodation such as guest house, homestay and camping because they don't like luxury hotels and motels but in DSPNP they prefer to stay at homestay and eco lodge i.e. national park accommodation. Choosing from different ecotourism activities hiking, trekking, enjoying waterfalls and tasting local cuisine are mostly preferred but biking and day

trips are less preferred because of the dangerous road and hot climate. They travel mostly by red van from Chiang Mai city because its easily available and cheap medium of travel. Maximum number of tourist thinks those accommodations are inside the city and architecture style of accommodation are vernacular and contemporary. From questionnaire it is proved that most of the tourist want camping ground, flexible tents, toilets, drinking water, vehicle parking and information counters as a services provided by accommodation but they don't want solar panels, fireplaces, educational spaces and meeting halls. Talking about the quality of spaces in accommodation at DSPNP most of people think food, camping area and fire pits area are good but they think health centre, information counters and meeting halls are not good. It's because people at information counter don't understand English language properly and signage are also in Thai language so tourist may get confused. These accommodations only provide primary health care and in serous case tourist need to come back to Chiang Mai city which is quite far from DSPNP so they say health centres are not good. When asked about the important things should followed by accommodation to improve quality of ecotourism in DSPNP, most of the tourist thinks accommodation should use sustainable transportation system (Transportation runs from renewable energy or electricity such as cable cars and electric vehicles rather from bio fuel), should minimizes the use of harmful chemicals in forest or fields, should recycle the solid and liquid waste, should save important natural as well as cultural heritage and should harvest rain water for ecotourism development. They don't suggest uses of fridge and television, planting trees and use of ecological design certification and accreditation may be because they think it's all about enjoying nature which is not touched by human activities. Those tourists were very satisfied with their trip and interested in learning history, social and environmental and culture of DSPNP.

5. Results

Another main objective of this research is to provide design criteria for accommodation for future development so vast analysis is required. After knowing the existing problems of the site researcher is planning to conduct in depth interviews with responsible authorities, tourist, local people and mainly with architects and planners. Interviews will be problem solving and researcher will observe main reason so that it can be easily related in developing criteria. After interviews researcher will be able to develop

design criteria for accommodation in DSPNP for future development. The criteria for design and construction of accommodation for ecotourism and natural conservation should be based on following

Energy use: Accommodation at DSPNP completely rely on electricity from Chiang Mai city, the villagers use fuel wood for cooking so these things need to be controlled to save forest and energy. Renewable energy such as solar panels for electricity and biogas for cooking should be adopted to conserve use of fossil fuel which is very limited and prevent forest from fire hazards (Recent wildfire of DSPNP in 2016 caused huge damage in forest and animal near Monthathan waterfall).

Transportation: Accommodation at DSPNP should not always rely on transportation that use fossil fuel. Which is very expensive and generates air, water, soil and noise pollution that is harmful for people, animals, forest and built environment of DSPNP. Electric vehicles and cable cars should be introduced in some place for transportation but not cutting the trees and not harming local natural and cultural heritage.

Materials: For being example of sustainable ecotourism the existing and upcoming accommodation should use local materials and technology in construction, should conserve the local architecture and heritage. In case of DSPNP local materials for construction such as timber stone, bamboo and thatch can be used but in a sustainable way and also should conserve Thai Lanna architecture and identity of local place.

Water: The conservation of water is most necessary thing in DSPNP because it is the source of drinking water for Chiang Mai city from the histories. Accommodation should harvest rain water and use sustainable ways of filtration in DSPNP to reduce scarcity of water. They should apply techniques to minimize use of water in bathroom and toilets such as using air assisted flush commode.

Land use and ecology: The primary goal national park and conservation area is to protect land area, forest, animals and everything comes in hand for conservation. Huge scale construction will demand a big area and force to cut forest and natural habitat which is not suggested by ecotourism so small scale accommodation should be constructed like homestays, campsites, eco lodge and eco resorts in DSPNP.

Health: Health is also very important factor in helping designing accommodation. In DSPNP at least primary health post or clinic is necessary for the tourist as well as people so they don't have to depend every time on Chiang Mai. The food provided by

accommodation should be from local and without harmful chemicals. Even the materials of construction should be free from harmful chemicals and should be suitable for environment.

Pollution: Pollution is also the biggest issue in DSPNP it's because of the negligence of tourist and responsible authorities. Which can be solved by sustainable waste management technique like reducing, recycling, reusing for both solid as well as liquid waste.

Sustainable technology: Ecotourism always demands sustainable techniques for every stage of construction and maintenance of accommodation. Using sustainable materials, using alternative energy, using natural heating and ventilation, water and waste management and zero energy techniques in buildings are the important strategies that can be used as much as possible in DSPNP.

Accreditation: Accreditation is the process in which certification of competency, authority, or credibility is presented by Ecotourism Authorities. The accreditation process ensures that their certification practices are acceptable, typically meaning that they are competent to test and certify third parties, behave ethically and employ suitable quality assurance. To develop accommodation at DSPNP it should follow the regulation from specific authorities which helps accommodation to promote business through ecotourism.

6. Conclusion

No doubt, eco-tourism is much suitable for Thai context. Natural surroundings are the main features of Thailand which are also the key elements of eco-tourism. Today, tourism being a major and important industry as a source of foreign exchange has an important role in economic development of the country, like Thailand. Thailand's ecotourism, which is dependent on ecology, environment and host communities, is now being widely promoted by communities and the government. Doi Suthep Pui is an appropriate place to investigate the roles that ecotourism can perform in visitor's rewarding experiences, environmental conservation and resident's local culture and way of life

7. References

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