

## CHAPTER 4

### Data Analysis and Findings

This chapter focuses on the data analysis and findings in this research study. It consists of five sections. The first and second section presents the data analysis from site review of the existing plan and field survey respectively in a descriptive writing and mapping, whereas then third section presents the data analysis which summarizes the findings from 200 questionnaires and fourth section presents the data analysis which summarizes the findings from the data collection out of 8 interviews. The fifth section illustrates design criteria for accommodation in Doi Suthep-Pui National Park by comparing it to the related literature to achieve objectives of the research. Data was analyzed and summarized in a readable interpretable form. SPSS (Statistical Package for Social Science), AutoCAD, Adobe Photoshop and Microsoft Word were utilized to analyze the data.

#### 4.1 Results from Site Revision

Research began with the analysis of the selected site through field visit and field survey. The researcher started field trip to Doi Suthep-Pui National Park on 18 November 2015 from Chiang Mai University. The main objective of visit was to analyze the existing situation of accommodation inside national park. For the first accommodation, researcher went was Doi Pui Campsite which was one and half hour away from Chiang Mai University by red taxi. Researcher hired red taxi and some Thai friends to go to Doi Pui Campsite, which is located 2 km below Doi Pui Mountain and 5 km before Khun Chang Khian Village. It is the biggest campsite area in whole national park with capacity of 300 people per night. Researcher found that the highest tourist season for camping in Doi Pui is December to April because it is winter in Chiang Mai and surrounding area. Mr. Udom Booddikham, Ranger of the national park, he informed researcher the maximum number of tourists in high season is 100 per night and low season is 10 per night. Japanese and European tourists used to be high numbers in previous years but during recent year, Chinese tourists were mostly seen as well as Thai tourists. He also acknowledged

researcher that they provide tents and sleeping bags for the campers, which cost around 225 baht for 3 people. Facilities such as tents, food, parking, information counters, exhibition and picnic arrangement were provided by campsite but they didn't have indoor lodging and health facilities. Campsite was focused on providing ecotourism experience such as cycling, hiking and observation of plants and birds. For education and exhibition, they had exhibition hall with photograph, models and souvenirs of Doi Suthep-Pui National Park. The campsite was managed by the national park and during high season nearby villagers used to come for help. The campsite had facilities of parking for 20 vehicles. They had a provision of electricity, public toilets and raised platforms for recreation but they did not have drinking water, sewer and amphitheater. The campsite had supporting elements such as 4 view decks, fireplaces and restaurant. They also had solar plant installed but they were not in use due to lack of maintenance. They used trucks to collect waste every day and send them to another location near Chiang Mai City. They only had trash cans which were placed in six different location of campsite. The specialties of the campsite were its location at the top of national park, the plant and bird species and beautiful view of Chiang Mai city at night.



Figure 4.1 Doi Pui Campsite (Taken on 18-11-2015 by Pradip)

The next accommodation was Khun Chang Khian Homestay. Homestay was located inside the Hmong Village, 5 kilometers away from Doi Pui Campsite. The owner of homestay was one of the local people. Homestay had 8 bedrooms with outdoor sitting area, combined bathroom and sauna. Mrs. Supansa Yhungjyunhul caretaker and informant of homestay said the total capacity of homestay was 32 people per night. During High season, there were 32 people and during low season number was only 1 or 2 per day sometimes month. Room prize was 500 baht per room, one room for 4 persons. There were no open camps for tourist to stay outside. They used to provide food for the tourist but it needed to be confirmed and booked first. There was no cooking space inside the homestay. They had space for fireplace and barbeque for night time. Talking about the services they did not have parking space. They did not have information counters and primary health clinic nearby. Toilet, electricity and drinking water facilities were provided but sewer system and waste area were not seen. For ecotourism and recreational activities, they had village tours and ethnic group dance show to display cultural dress, dance and lifestyle of native Hmong people. One of the specialty of the homestay was clay made group sauna.



Figure 4.2 Khun Chang Khian Homestay (Taken on 18-11-2015 by Pradip)

After leaving Khun Chang Khian researcher headed towards Doi Pui Village for searching another homestay. There used to be 2 homestays before, but then they closed it because of low number of tourists. When researcher asked some villagers about reason of closing homestay, they replied that the homestay had poor quality of living and was not well managed. Researcher found that the homestays were forced to close because of poor maintenance.



Figure 4.3 Abandoned homestay in Doi Pui village (Taken on 18-11-2015 by Pradip)

Next place of visit was National Park Accommodation, which was located very near to Phrathat Doi Suthep temple. This accommodation was owned by national park and had bungalows, campsites, meeting halls and dormitory. Ms. Janjitra Wanaporn accommodation officer at national park accommodation informed that the total capacity of accommodation was 120 people per night in bungalows and dormitories, 100 people in campsite and 400 people in two meeting halls. Tent was not provided in the area. Tourist interested in camping could bring their own tents and camp without any charges.

Table 4.1 Room price in National Park Accommodation

Building Number	Room Name	Persons	Price in Baht	Room Type
1	Dormitory 2	15	1500	Dormitory
2	Suthep House 105	6	2500	Bungalow
3	Suthep House 106	10	3000	Bungalow
4	Restaurant	-	-	-
5	CM House 1384	8	2500	Bungalow
6	Suthep House 101	8	1500	Bungalow
7	Suthep House 103	8	2500	Bungalow
8	Suthep House 102	12	2500	Bungalow
9	Suthep House 104	8	2000	Bungalow
10	Meeting hall 1	300	-	-
11	Dormitory 1	40	2500	Dormitory
12	Toilet	-	-	-
13	Meeting hall 2	100	-	-
14	Royal Residence	-	-	-
15	Village houses	-	-	-
16	Campground	100	-	-

There was a restaurant to serve local food. Parking facilities was also provided. There was an information counters and picnic arrangement also but no health centers nearby. Basic service elements such as electricity, toilet, drinking water, sewer was provided but no fireplace was seen. Solid waste was collected in trash cans but no management of liquid waste was seen. Television and refrigerator were not provided by accommodation to engage tourist more in natural activities rather than confined in room. For ecotourism activities related to education and training, a written proposal should be prepared by tourist so accommodation could allow it to use. Researcher found that accommodation

used to buy coffee and vegetables from local market and from the villagers. There was no any faming practice seen by accommodation. Phrathat Doi Suthep temple and Bhubing Palace were the key attraction points nearby accommodation. Cycling, hiking, natural observation and relaxation were the main ecotourism activities.



Figure 4.4 National Park Accommodation (Taken on 18-11-2015 by Pradip)

The last site researcher went was Monthathan Waterfall campsite and accommodation, which was 10 km away from Chiang Mai University and on the way to temple. The area consisted of 2 campsites, 2 rental houses, Monthathan waterfall and Trekking trail. The total capacity of campsite was 150 persons per night. Number of tourists in high season was 50 and in low season was only 2-3 persons. The price of rental house was 1500 baht for 6 persons. Ms. Youpaporn Pakim, head of the informant said tents and sleeping bags were provided for the campers and the cost was 225 baht. For tourist who have their own tents price of the camp was only 30 baht. This accommodation was organized and managed by their own organization Monthathan Waterfall Organization. Services such as

tents, restaurant, lodging, parking, information counters health center and place for enjoying picnic were provided for food they encouraged tourist to cook by themselves Basic facilities such as parking electricity, toilet were provided. Place to fire, sewer, raised platforms, recreation was present there but no facility of drinking water was seen. Activities for ecotourism such as waterfall observation, bird observation, cycling and trekking was available. Especially people used to go there for picnic, waterfall observation, butterflies and mushroom observation. Tourist from USA and Europe were mostly seen and for camping Thai tourist were mostly stayed. The nearby attraction from this place was Huay Keaw waterfall and Chiang Mai Zoo.



Figure 4.5 Monthathan Waterfall Campsite (Taken on 18-11-2015 by Pradip)

#### **4.2 Results from Site Survey**

From 18 December 2015, Researcher performed detailed site survey. Data from site survey were collected and analyzed in readable form by mapping, drawing, sketching and information writing. From review of the existing plan researcher found out there were four places for accommodation, namely Doi Pui Campsite, Khun Chang Khian Homestay, National Park Accommodation and Monthathan Waterfall Campsite & Accommodation.

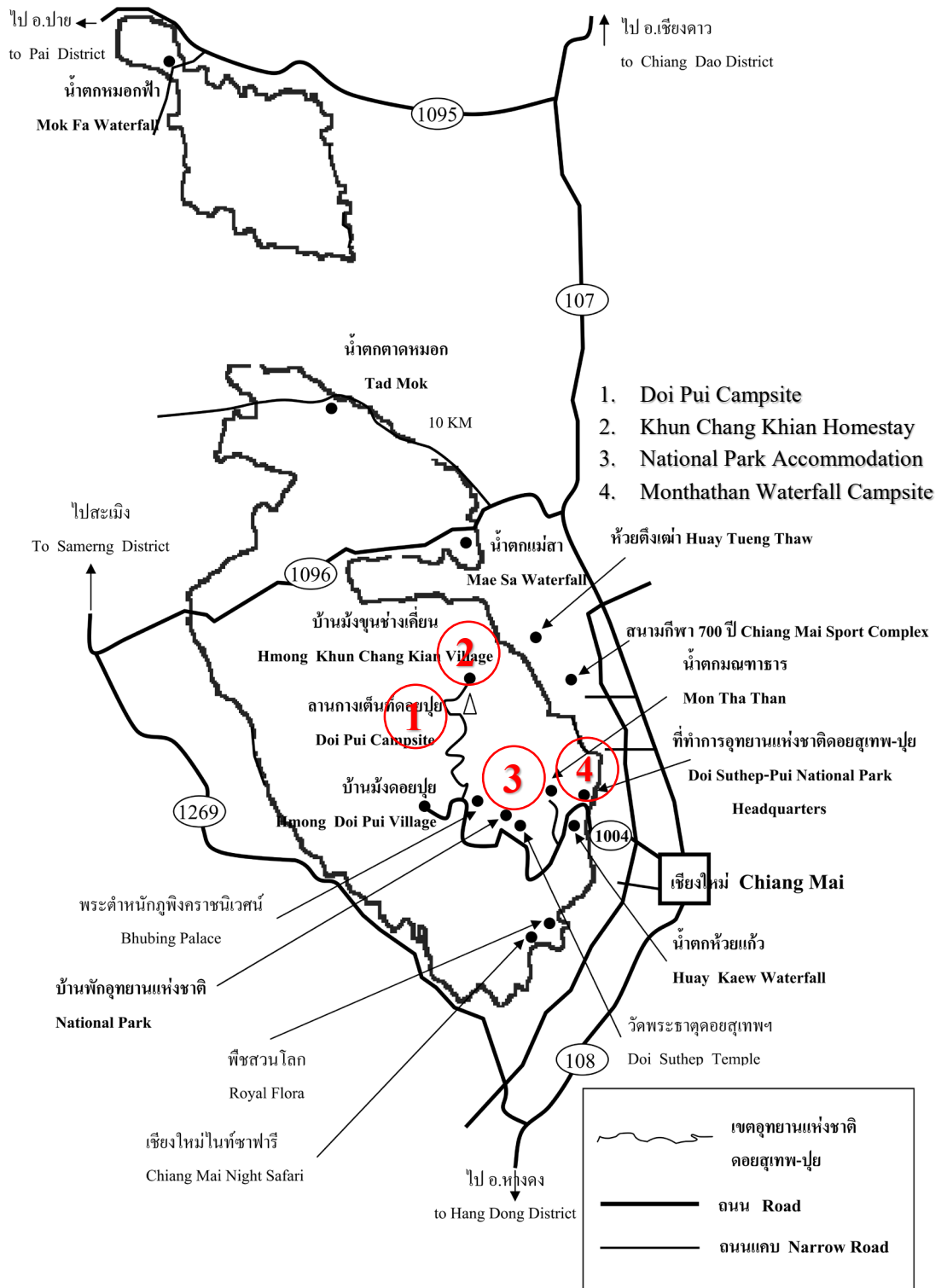


Figure 4.6 Travel map of Doi Suthep Pui National Park (DNP, 2015) redrawn by Pradip  
 The study area for this research is only the bigger plot shown in the map figure above,  
 which includes four places for accommodation namely Doi Pui Campsite, Khun Chang  
 Khian Homestay, National Park Accommodation and Monthathan Waterfall Campsite.



Doi Pui campsite is located 5 kilometers below Khun Chang Khian Homestay and only 2 kilometers below Doi Pui Summit. The capacity of campsite is 300 people and located inside forest. The campsite has vehicle parking, camping ground, information counter, restaurant, toilets, picnic areas, view decks and fireplace areas. Buildings such as information counter and restaurant are in contemporary architecture style with Thai Lanna style roof. Materials are reinforced concrete for structure, brick and timber for walls and fiber cement tiles for roof. Stone is used for flooring and color of building is dark grey, brown and green, which is done to blend with the nature. Information counter consists of counter, galley display area, store and toilet. The details of national park and related information along with souvenirs are provided. Two toilets are provided for both men and women. Fireplace and picnic tables are also provided. Trash cans are provided for collecting solid waste and drinking water is supplied. 4 decks are provided to enjoy the views of Chiang Mai city during day as well as night. Solar panels can be seen but not working due to lack of maintenance. For bird watching and hiking, nature trail is provided which connects Doi Pui summit with Doi Pui campsite.

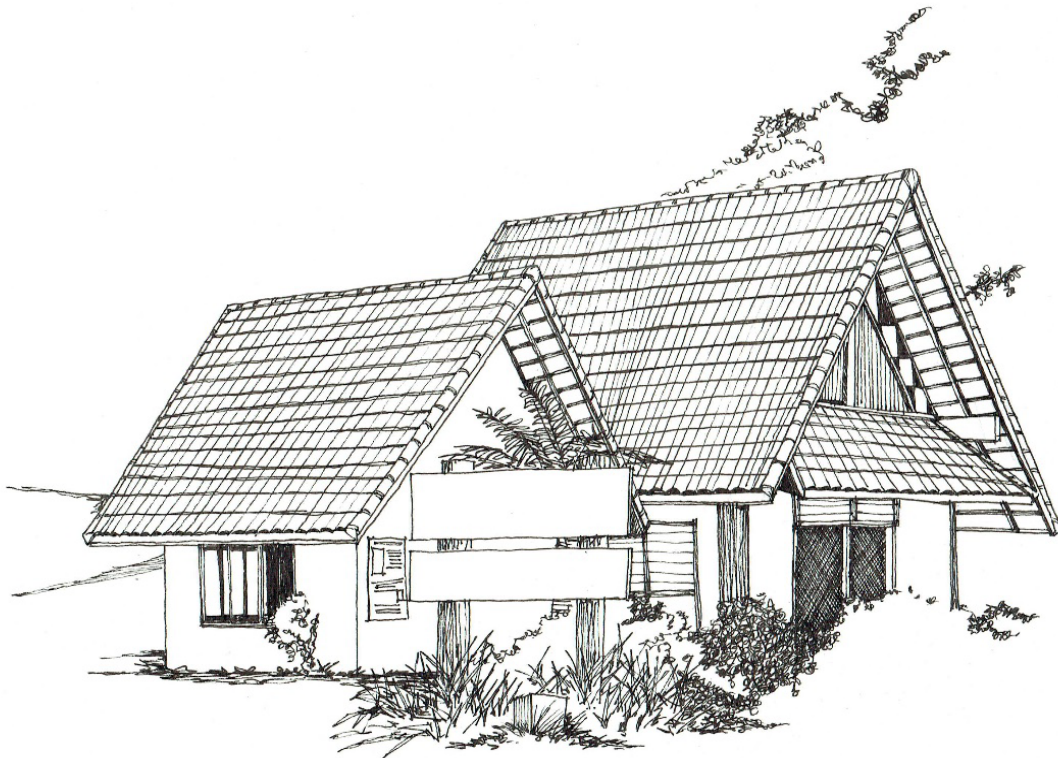


Figure 4.7 Sketch of information counter at Doi Pui Campsite

# Doi Suthep Pui Campgrounds Area

Doi Suthep Pui National Park

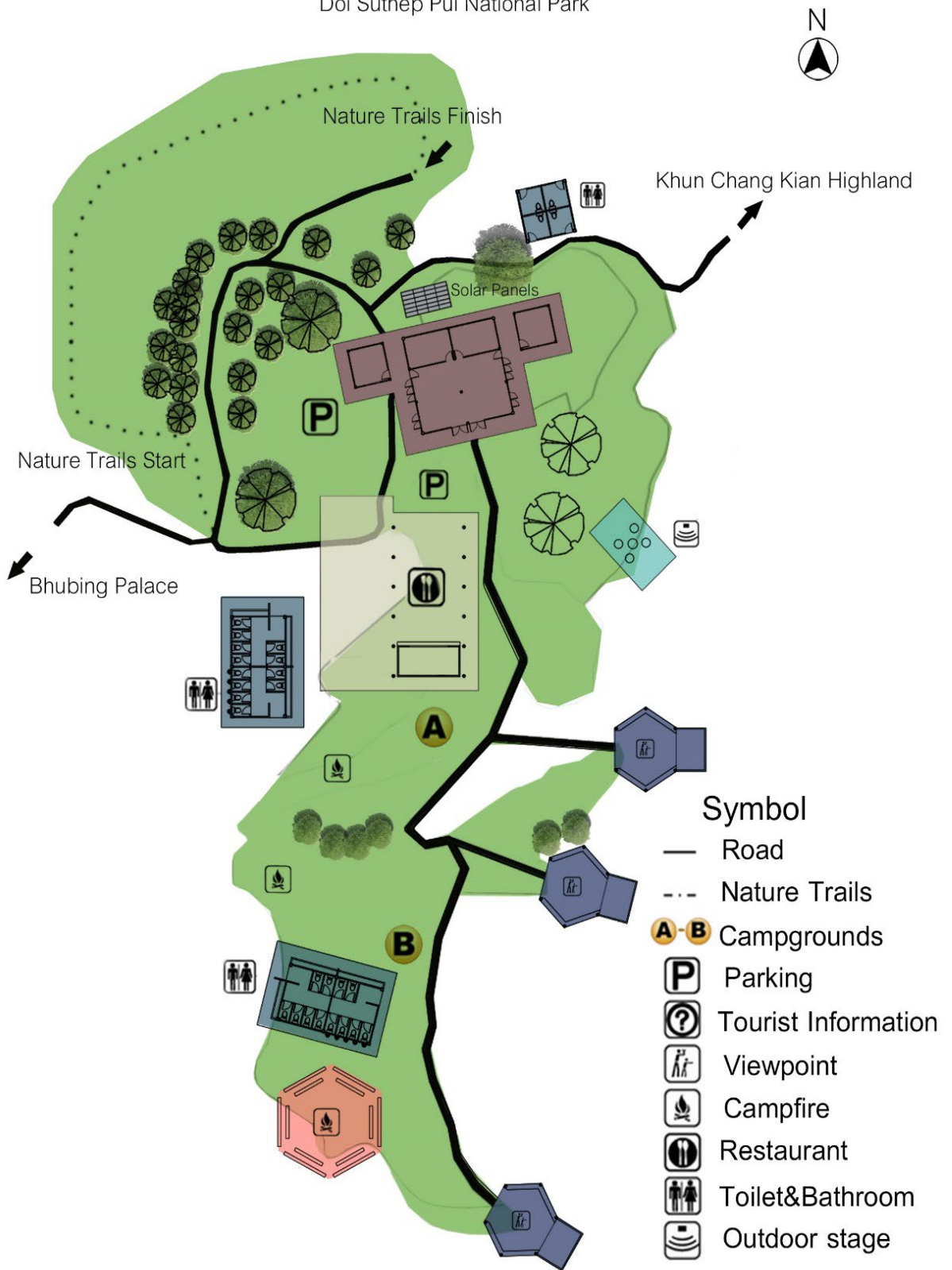


Figure 4.8 Site plan of Doi Pui Campsite

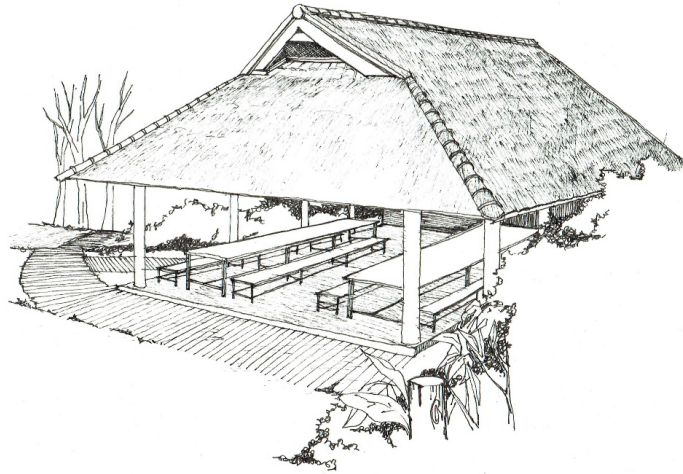


Figure 4.9 Sketch of restaurant at Doi Pui Campsite

Next Accommodation is Khun Chang Khian homestay is located inside Khun Chang Khian village and which is the farthest among four accommodations. Total capacity of Khun Chang Khian homestay is 32 with 8 bedrooms. Barbeques space, outdoor fireplace, group sauna, cottages and toilet for both ladies and gents is provided. Building materials are bamboo, timber and thatch roof. Timber post is used for structural column whereas bamboo weaved net in timber covered with clay is used for wall. For flooring in passage and toilet tiles are used but for roofing thatch is used. The house architectural style is vernacular and looks similar with the local style of the village. Homestay is connected to 4m wide road the west side and surrounded with trees on the north and east side. The owner of homestay lives in separate house on the south of the homestay.



Figure 4.10 Sketch of Khun Chang Khian Homestay

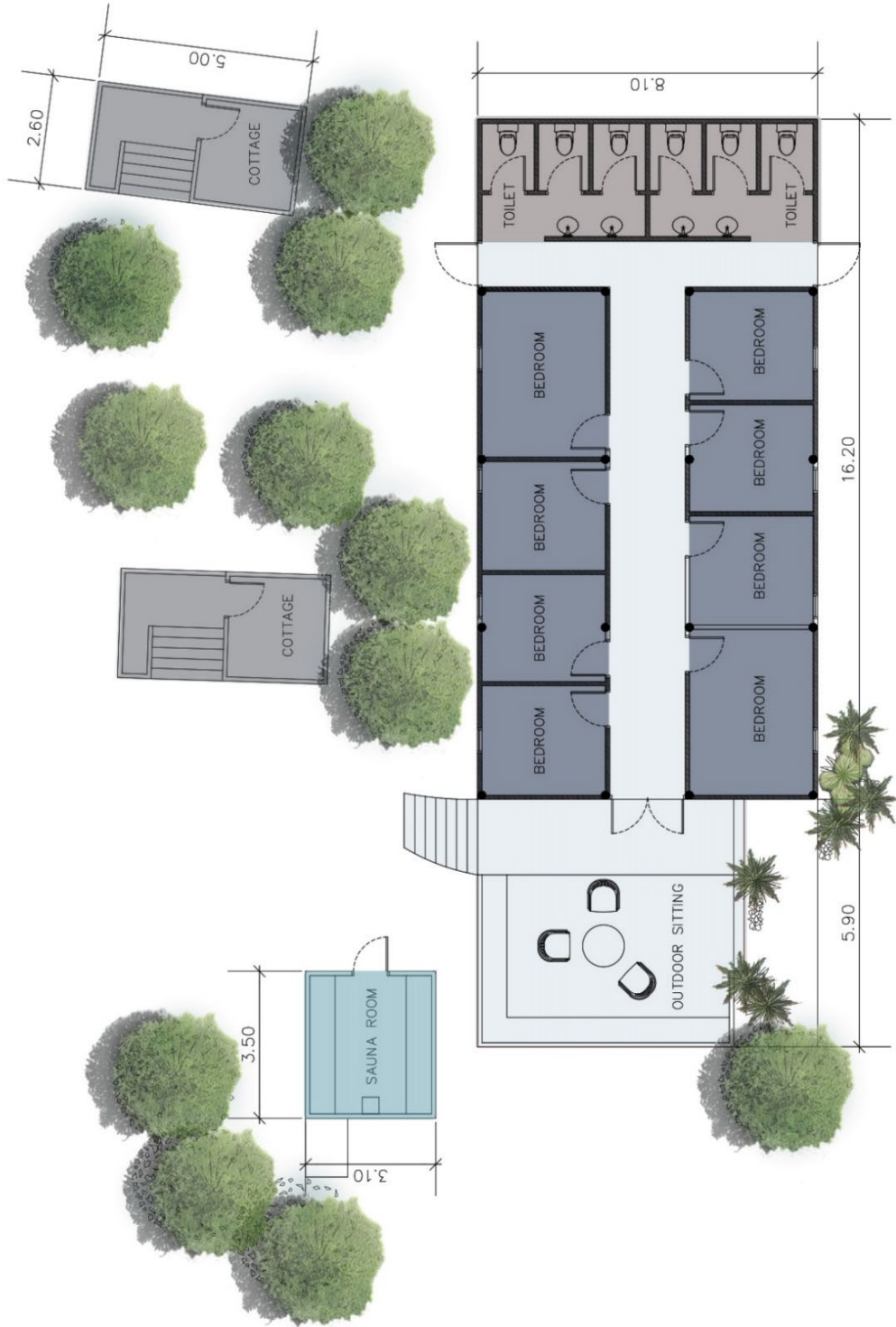
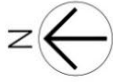


Figure 4.11 Ground floor plan of Khun Chang Khian Homestay (Rotated View)

Third accommodation is National Park Accommodation, which is managed by national park itself. It provides total 11 accommodations for travelers consisting of bungalows and dormitories. Most of the bungalows are designed in a contemporary architecture style. Reinforced cement concrete is used for structure, brick and concrete block are used for wall, timber for door and windows, cement and tiles for flooring and fiber cement tiles for roofing.

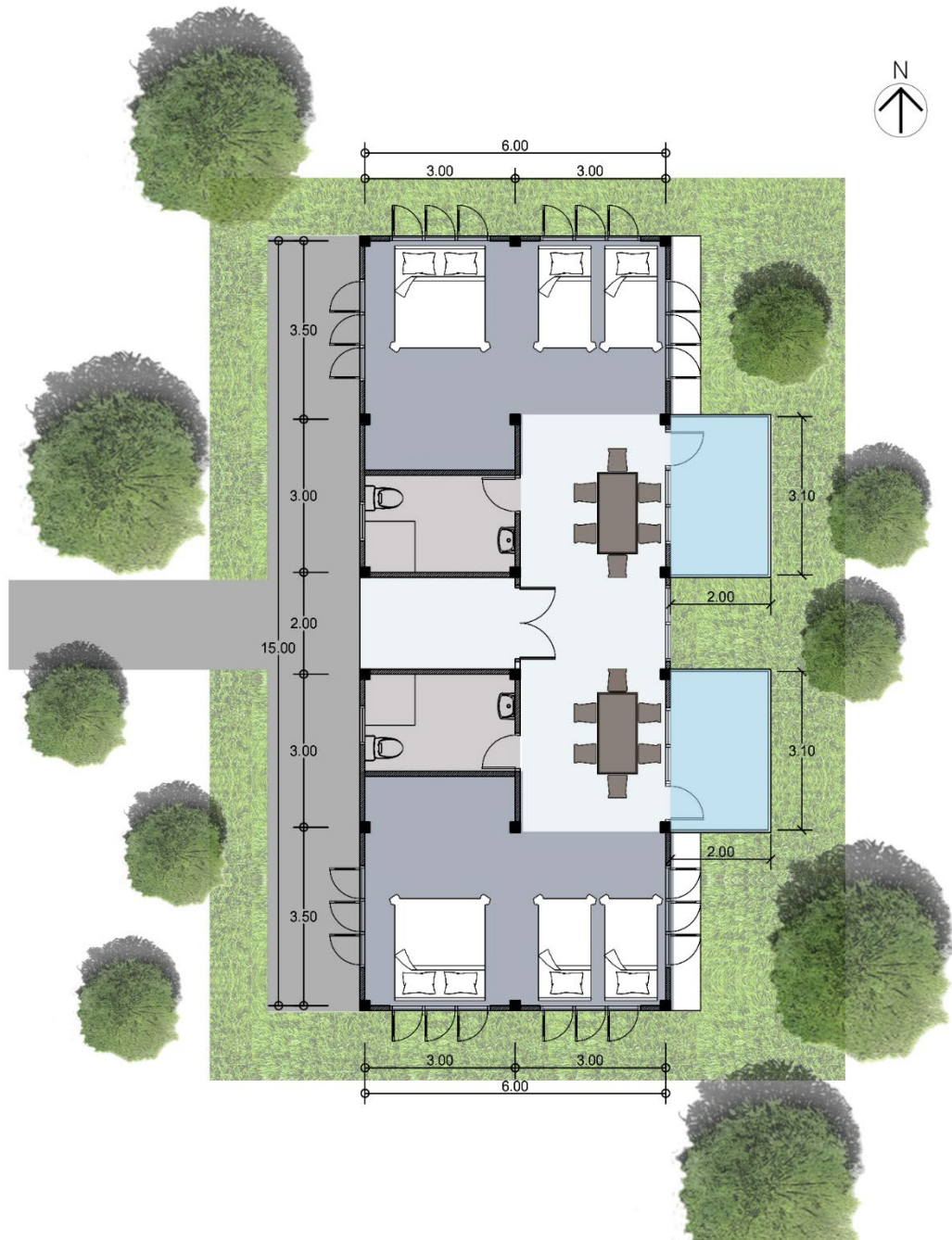


Figure 4.12 Ground floor plan of Bungalow CM 1384 in National Park Accommodation

CM house 1384 consists of 2 bedrooms, 2 toilets, 2 dining rooms and 2 view terraces in a mirror layout. Total capacity of this house is 8 people and price of stay is 2500 baht per room per night. The architectural style of this house is same as another house. Reinforced cement concrete as a structure and Thai Lanna style sloped roof.

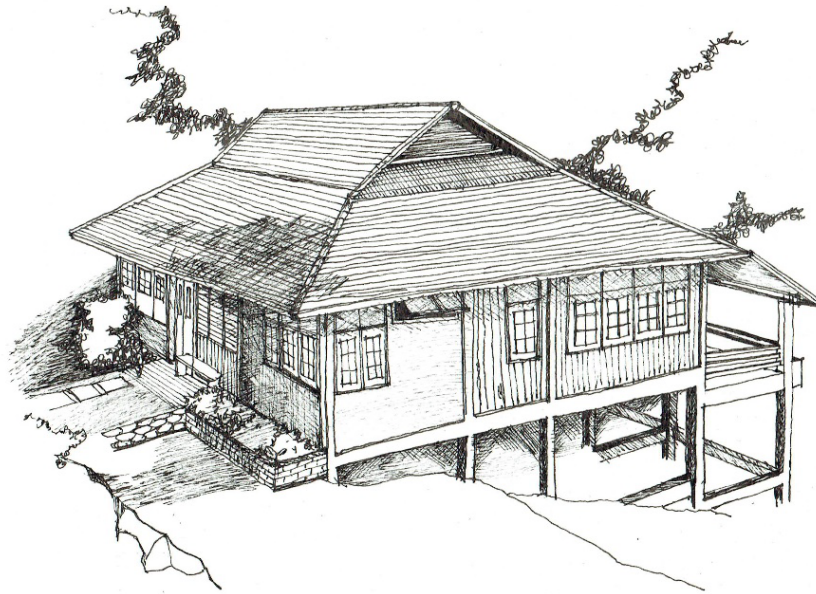


Figure 4.13 Sketch of CM House 1384 inside National Park Accommodation

National park also consists of dormitory houses, meeting halls, royal house, toilets, restaurant and camping ground. The capacity of two dormitories are 15 and 40 respectively. Dormitories are common rooms on the same floor. Meeting hall 1 has bigger capacity of 300 people for meeting and meeting hall 2 has 100 people. Along from fixed roof lodge, campground is provided for tourist who want to stay in tents and outside. Fireplace is provided inside bungalows but outside fire camps are not allowed. Refrigerator and television are not allowed to use by national park. Meals for tourist is provided by restaurant itself but farming is not seen. Food and vegetables are bought from local market and from Chiang Mai city. Vehicle parking is provided but any alternative energy source such as solar is seen, only electricity from national grid is used. Trash cans are provided for solid waste but no management of liquid waste was seen.

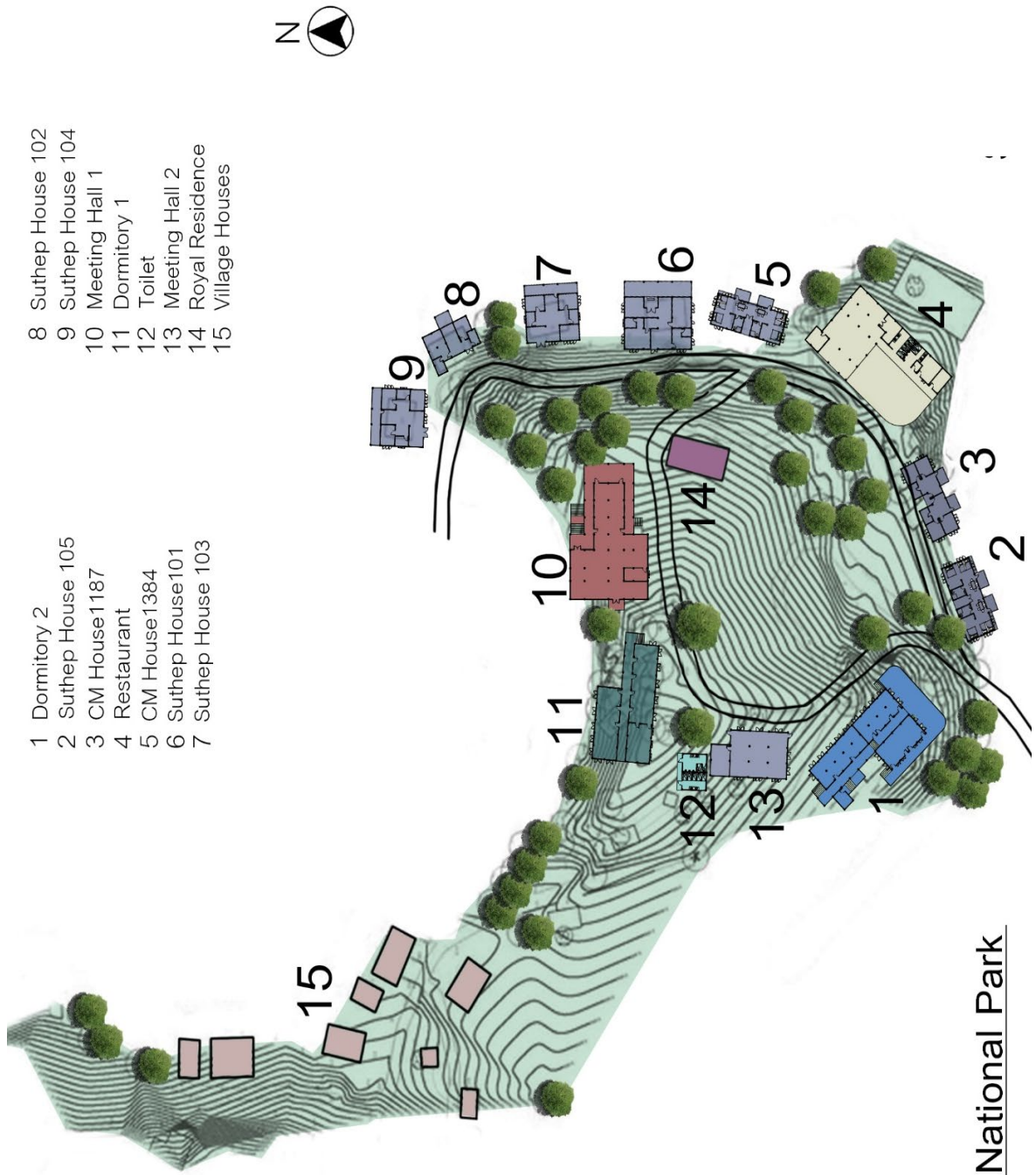


Figure 4.14 Site plan of National Park Accommodation (Rotated View)

Doi Suthep Pui National Park

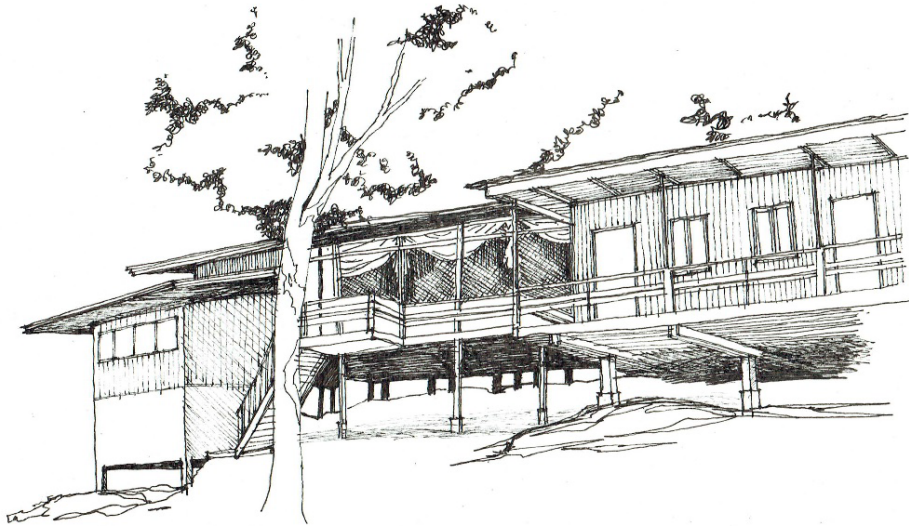


Figure 4.15 Sketch of Dormitory 1 in National Park Accommodation

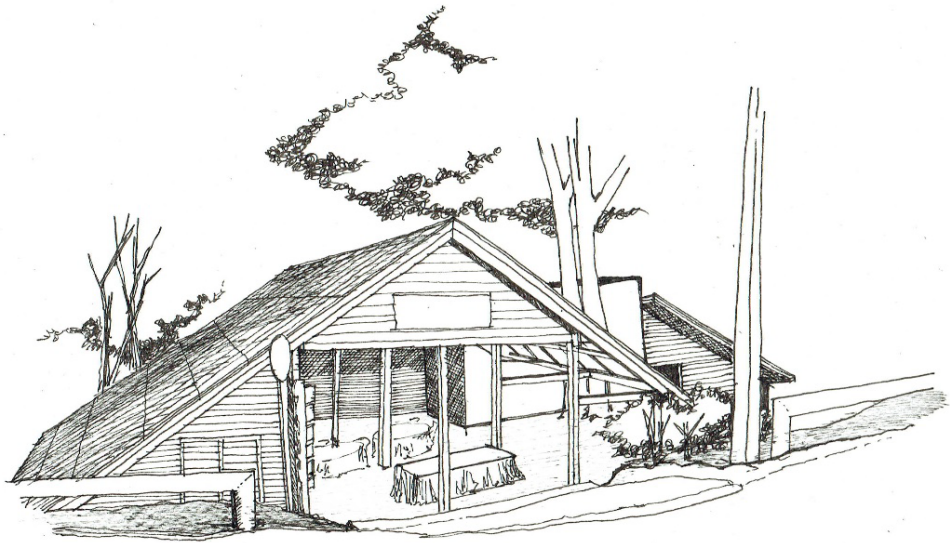


Figure 4.16 Sketch of Restaurant in National Park Accommodation



The fourth and last accommodation is Monthathan Waterfall campsite and accommodation. It is located 6 km away from Doi Suthep-Pui National Park headquarter. This campsite is named after the Monthathan Waterfall. It is considered as the source of water for Chiang Mai city from history. Accommodation area consists of campsite for 100 people, two rental bungalows, parking, information center, restaurant and public toilets. The capacity of rental house is 6 persons per each house. Place for campfire and picnic is provided near Monthathan Waterfall. Information center consists of gallery and photography area and customer service counter. Cottage is provided for the head and securities to live in. Restaurant is building is no more being utilized. Toilets are provided at five different place to make it easier for visitors and campers. The architecture style of building is same as National Park Accommodation but small in scale. Materials used are reinforced cement concrete in structure, bricks and concrete blocks in wall, and fiber concrete tiles in the roof. Floor are made of stone, tiles and some place timer flooring can also be seen. This campsite provides basic facilities and services for tourist. For food, either tourist need to cook by themselves or take from the city. The price of rental house is 1500 baht for each house.



Figure 4.17 Sketch of information center in Monthathan Campsite



Figure 4.18 Cottages in Monthathan Campsite

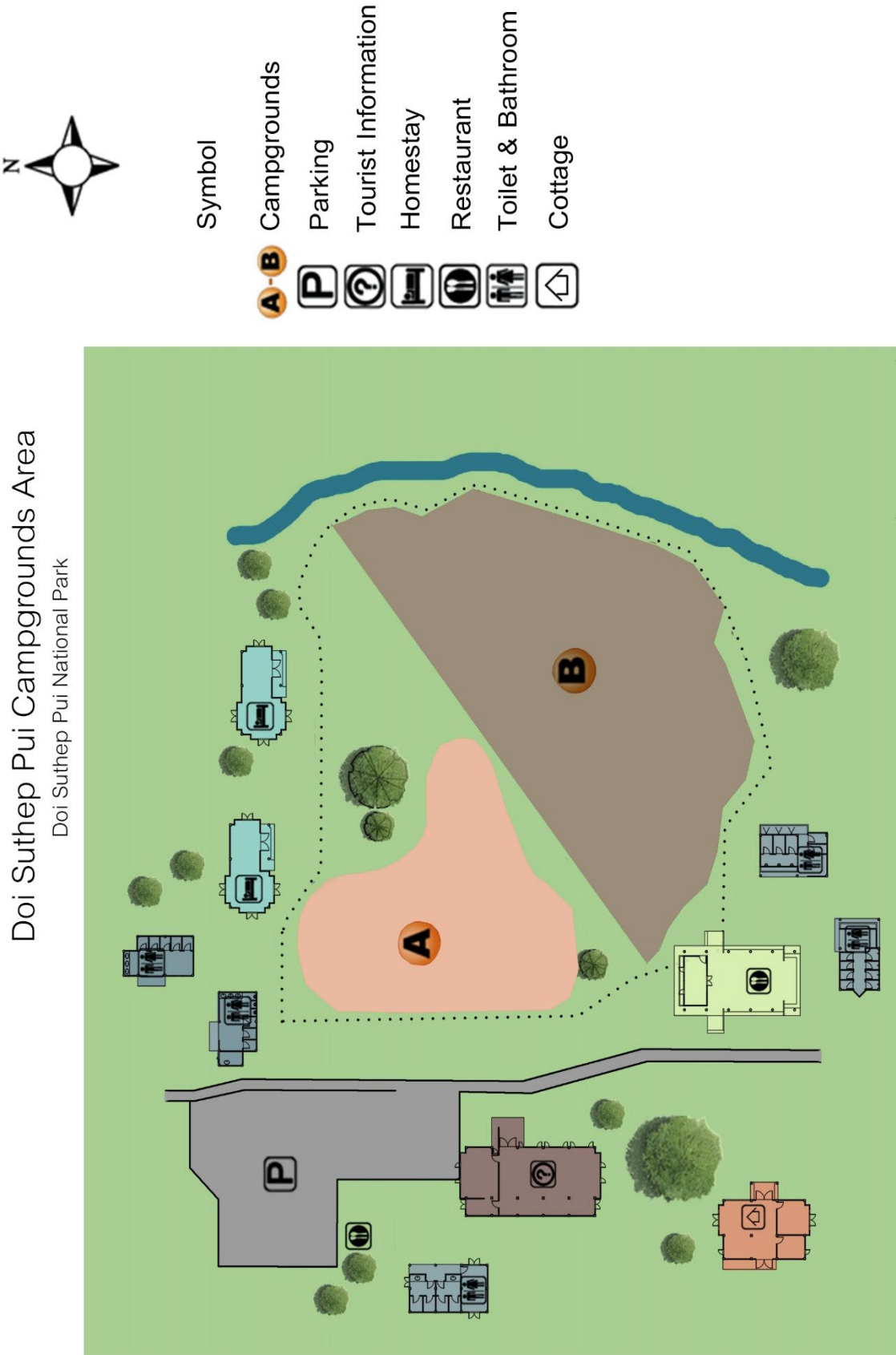


Figure 4.19 Site plan of Monthathan Waterfall Campsite (Rotated View)

### 4.3 Results from Survey Questionnaires

Regarding to the research design of this study, researcher conducted both quantitative and qualitative approaches. On the quantitative part researcher used 200 set of questionnaire as a tool for identifying the problems on accommodation before collecting data from qualitative part, which was interview. Questionnaires were set up regarding the existing problems of ecotourism and their correlation with built structure in Doi Suthep-Pui National Park. The questionnaires were mainly divided into four sections

- i. About personal information
- ii. The built environment and its relationship with ecotourism activities
- iii. Problem analysis and eco approach
- iv. Their satisfaction and opinion on built structures like resort, campsites, homestay and attraction points

So, the data obtained from each section are analyzed and results are explained in the form of summary. The data collection was taken during March and April 2016 which was off season due to the limitation on research timing

#### 4.3.1 About personal information

##### a. Gender

Figure 4.20 below shows that among 200(100%) tourists 119(60%) were male and 81(40%) were female.

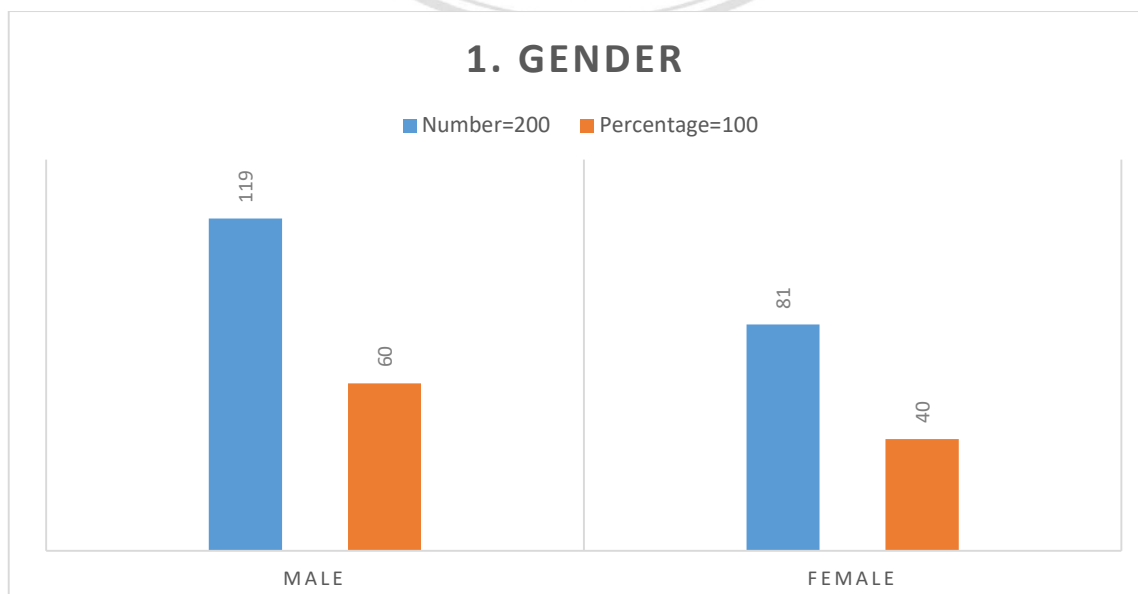


Figure 4.20 Number and percentage of male and female travelling in DSPNP

b. Age

Figure 4.21 below shows that among 200(100%) tourists 113(57%) were below 30 years, 75(37%) were from 30 to 60 years and 12(6%) were above 60 years.

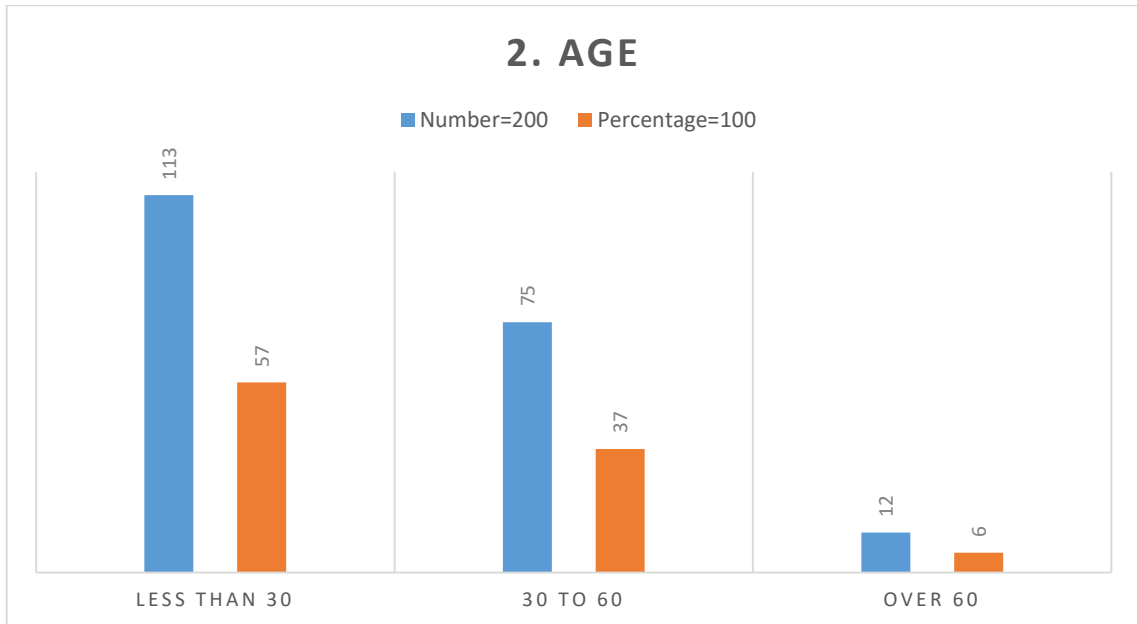


Figure 4.21 Number and percentage of age group travelling in DSPNP

c. Education

Figure 4.22 below shows that among 200(100%) tourists 102(51%) were university graduate, 51(25%) were college graduate 47(24%) were under high school.

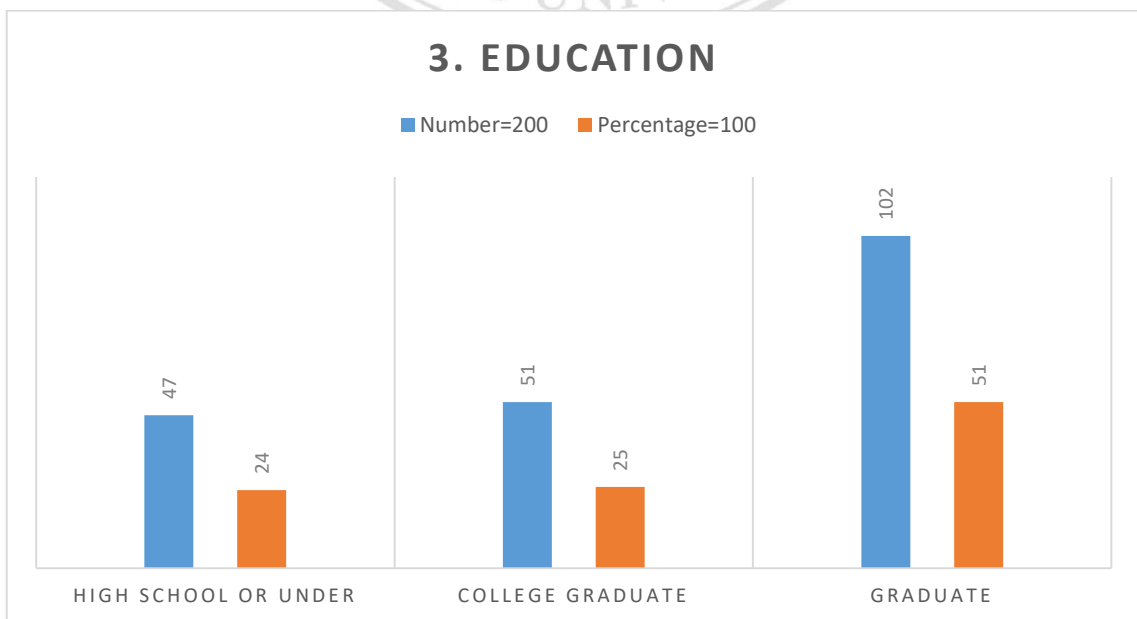


Figure 4.22 Number and percentage of education level of tourist travelling in DSPNP

d. Language

Figure 4.23 below shows that among 200 tourists 149 speaks Thai as a first language followed by 17 English, 154 speaks English as a second language followed by 4 Thai and 11 speaks Chinese as their Third language followed by 11 Japanese.

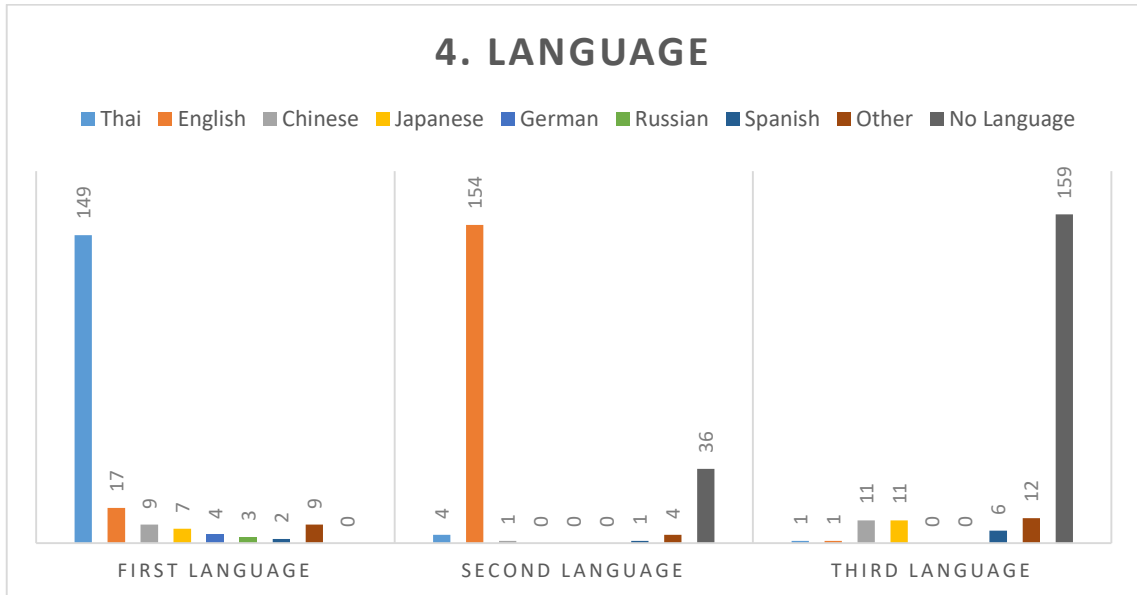


Figure 4.23 First, second and third language of tourist travelling in DSPNP

e. Marital status

Figure 4.24 below shows that among 200(100%) tourists 135(68%) were single, 63(31%) were married and 2(1%) were separated.

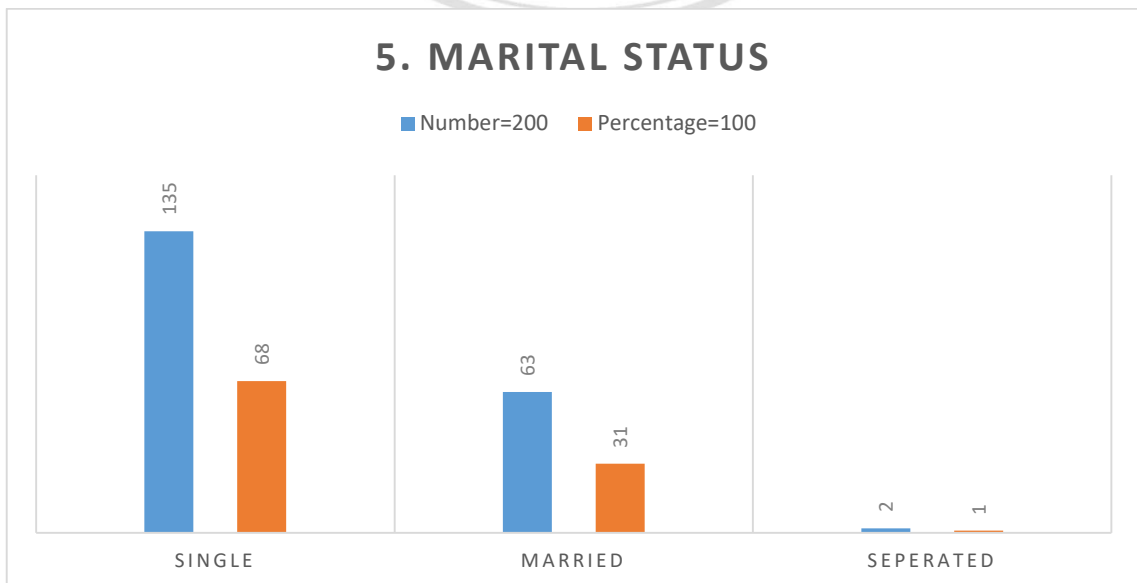


Figure 4.24 Number and percentage of marital status of tourist travelling in DSPNP

f. Monthly household income

Figure 4.25 below shows that among 200(100%) tourists 141(70%) had their monthly income less than TB 50,000, 47(24%) had TB 50,000 to 200,000 and 12(6%) had more than TB 200,000.

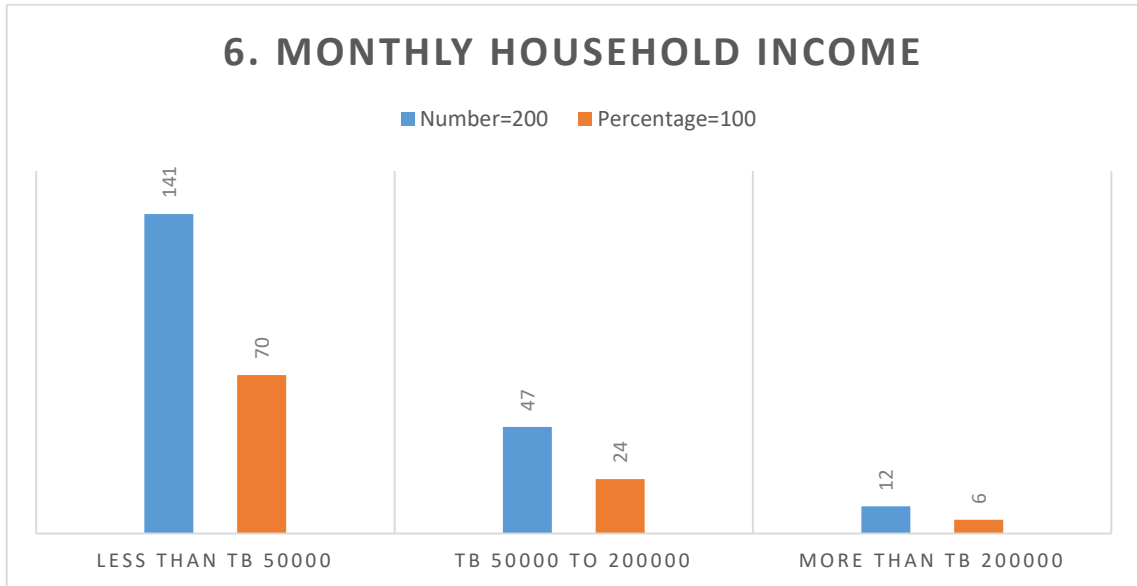


Figure 4.25 Number and percentage of household income of tourist travelling in DSPNP

g. Nationality

Figure 4.26 below shows that among 200 tourists 150 were Thai National and 50 were International mainly from USA, Japan, China, Korea, Germany, Britain, Denmark, Russia etc.

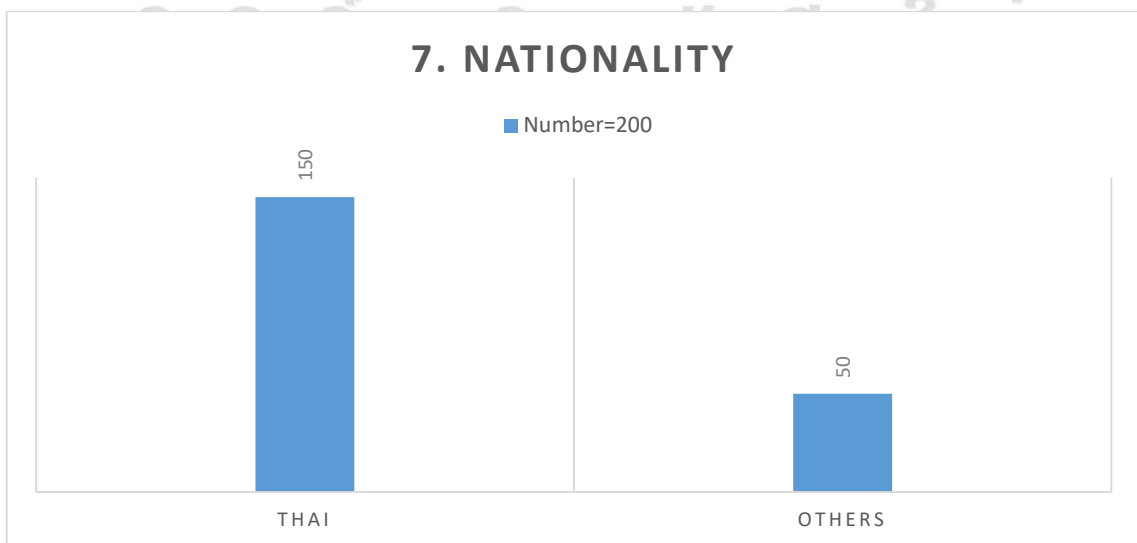


Figure 4.26 Number of nationality of tourist travelling in DSPNP

h. Origin of travel

Figure 4.27 below shows that among 200 tourists 150 were traveling from Thailand, 7 were from USA, 6 from Japan, 5 from China, 2 from Korea, Germany, Britain and Denmark and 24 from other countries.

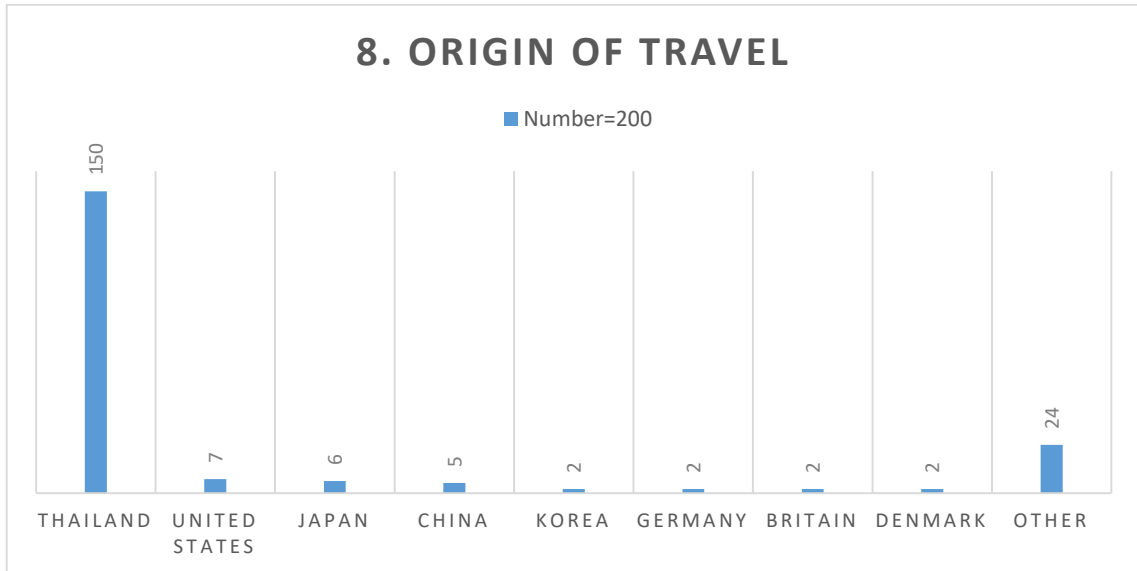


Figure 4.27 Number of nationalities of tourist travelling in DSPNP

i. Travelling Companions

Figure 4.28 below shows that among 200(100%) tourists 100(50%) were travelling with friends, 75(37%) with family and 25(13%) were traveling alone.

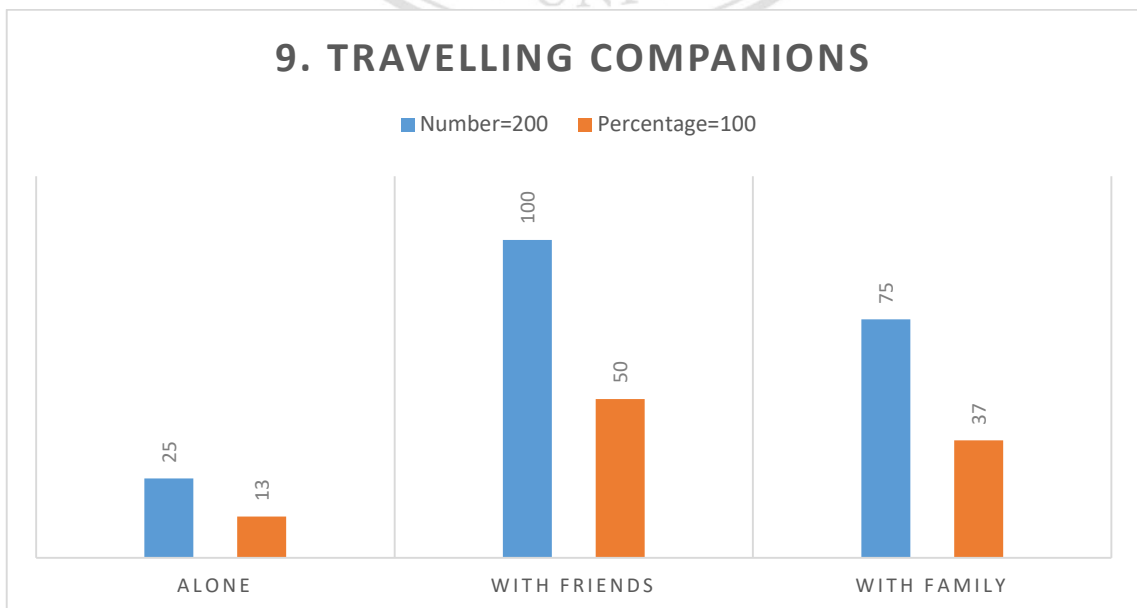


Figure 4.28 Number and percentage of group of travelers in DSPNP

j. Expenditure per day

Figure 4.29 below shows that among 200(100%) tourists 108(54%) tourists expenditure per day was less than 500 baht, 87(44%) tourists expenditure per day was between 500 and 2000 baht and 5(2%) tourists expenditure per day was more than 2000 baht.

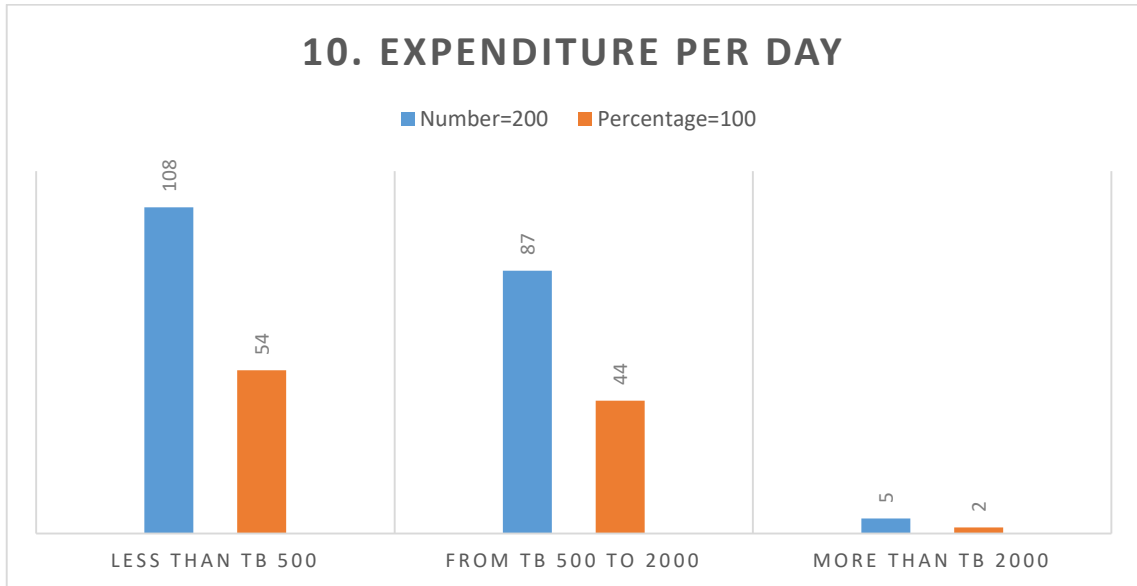


Figure 4.29 Number and percentage of expenditure per day of tourist in DSPNP

k. Times of visit

Figure 4.30 below shows that among 200 tourists most of them visited Thailand more than 10 times, DSPNP 1-10 times and Chiang Mai 1-10 times.

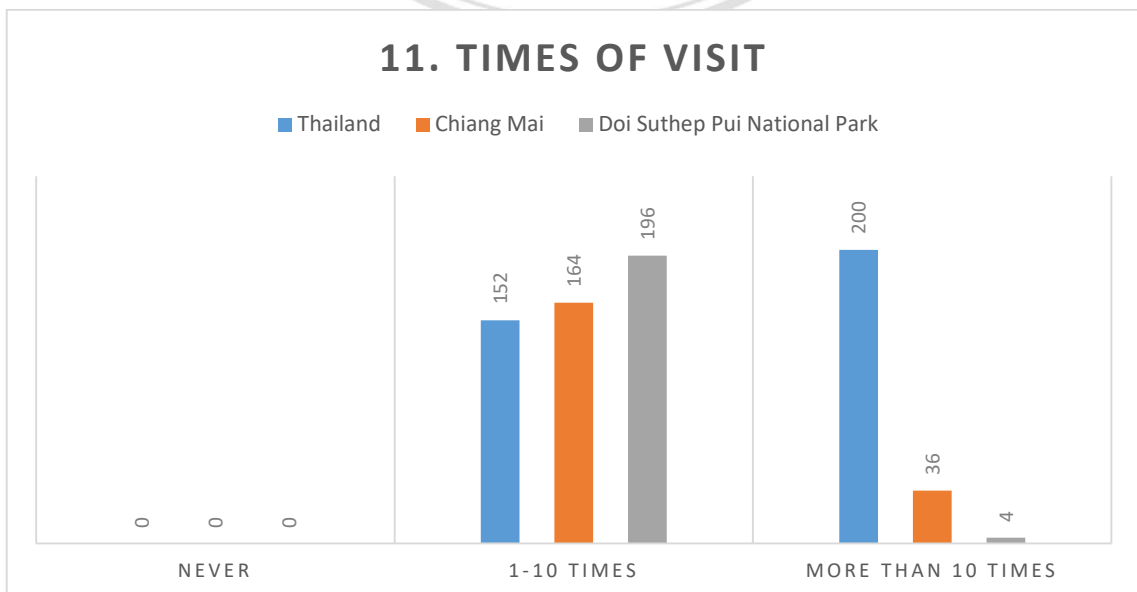


Figure 4.30 Number of tourist visited Thailand, Chiang Mai and DSPNP



#### 4.3.2 Summary of personal information

From the above data, it was found that Mostly male of age below 30 traveled to Doi Suthep-Pui National Park. It was seen that youth were more interested in ecotourism and nature activities such as wilderness camping, hiking, trekking and cycling. The tourist who travelled to Doi Suthep-Pui were highly educated and used Thai, English and Japanese languages. Mostly tourists were single and their monthly household income was less than 50,000 baht. Thai tourist were more than international tourists in the ratio of 3:1. Tourist were mostly coming from Thailand and travelling with their friends. All of tourists had been to Chiang Mai 10 times and Doi Suthep-Pui National Park 10 times. Origin of travel for majority of tourist was (Chiang Mai and Bangkok) of Thailand, United States, Japan China and Korea.

#### 4.3.3 The built environment and its relationship with ecotourism activities

##### 1. Duration of trip

Figure 4.31 below shows that among 200(100%) tourists 140(70%) had their trip for 1 to 3 days, 48(24%) had their trip for 4 to 7 days and 12(6%) had their trip for more than 7 days.

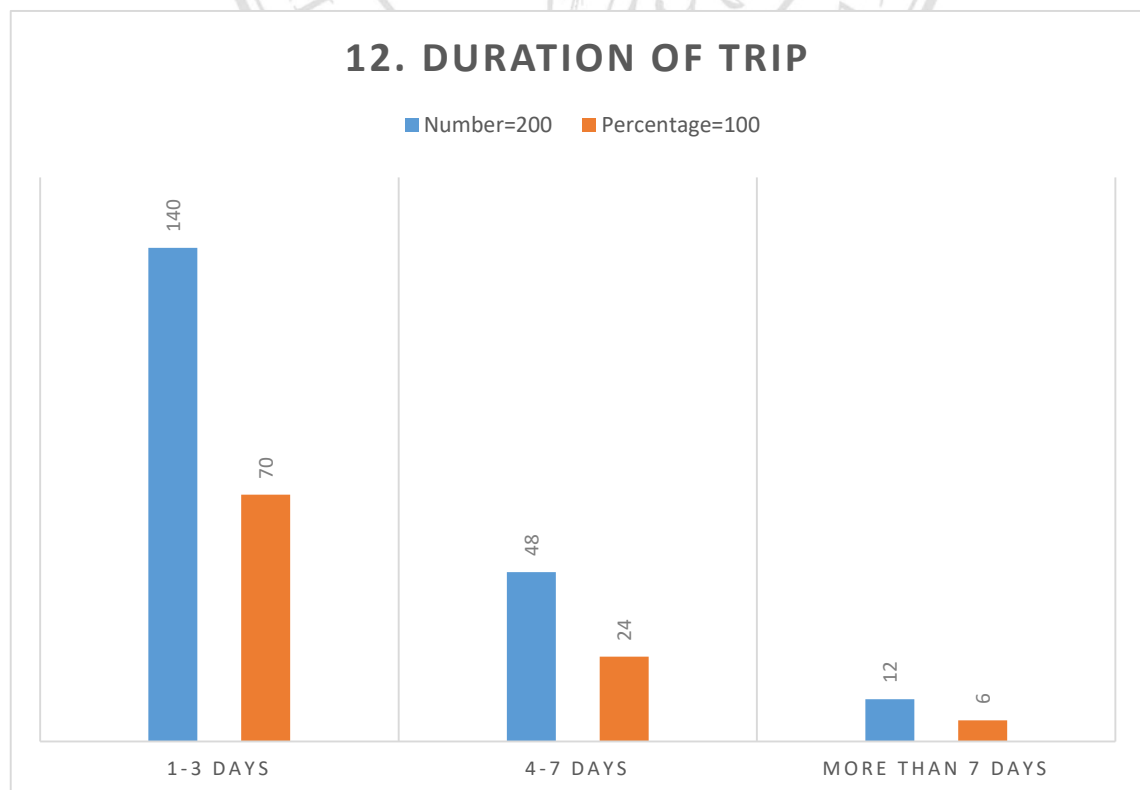


Figure 4.31 Number and percentage of trip duration of tourist in DSPNP

m. Heard about DSPNP

Figure 4.32 below shows that among 200(100%) tourists 150(75%) heard about DSPNP from friends and family, 40(20%) from internet and 10(5%) from newspaper, radio and television.

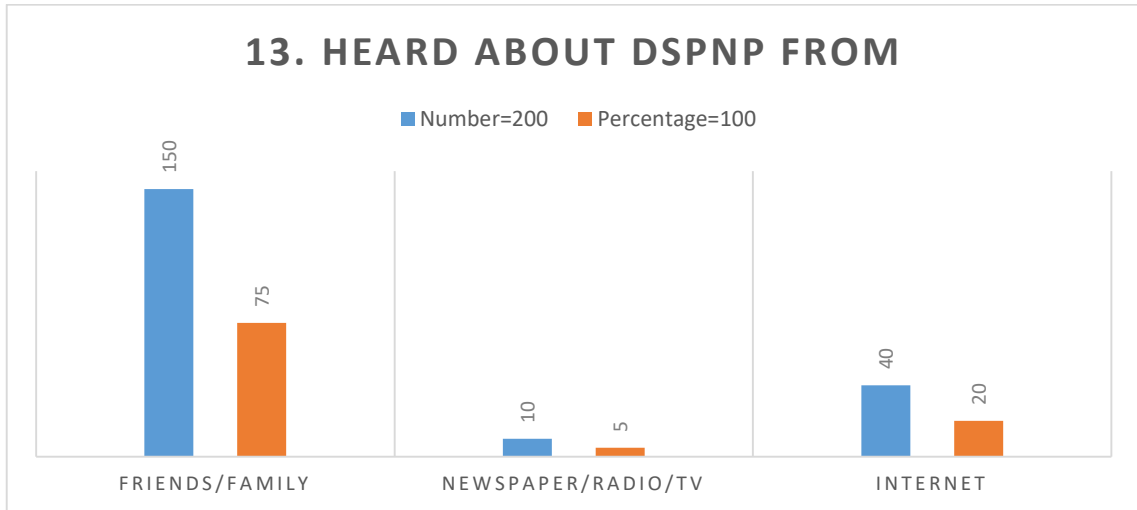


Figure 4.32 Number and percentage of tourist heard about DSPNP from

n. Chosen DSPNP to stay

Figure 4.33 below shows that among 200 (100%) tourists 109 chosen to stay at DSPNP because of good location, 71 chosen because of eco offering, 11 chosen because of tours and 6 chosen to stay DSPNP for wedding, anniversary, honeymoon and romantic escape and few chosen because of services, facilities and amenities.

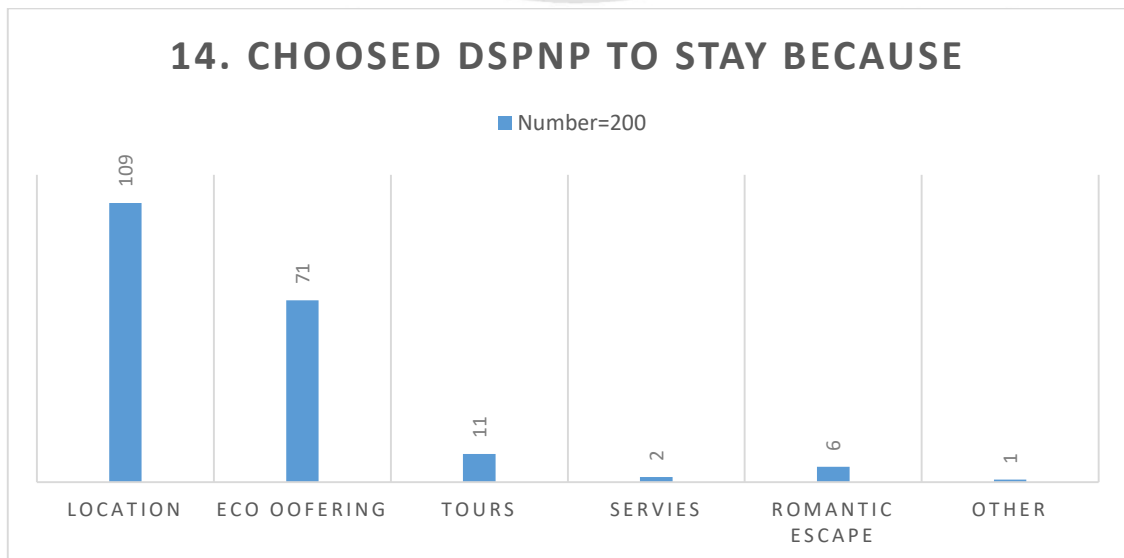


Figure 4.33 Number of tourist chosen DSPNP to stay

o. Eco lodge or resorts stayed before

Figure 4.34 below shows that among 200(100%) tourists 162(81%) had already stayed at eco lodge or resort 1 to 10 times before DSPNP, 16(8%) had stayed more than 10 times and 22(11%) never stayed at eco lodge of resort.

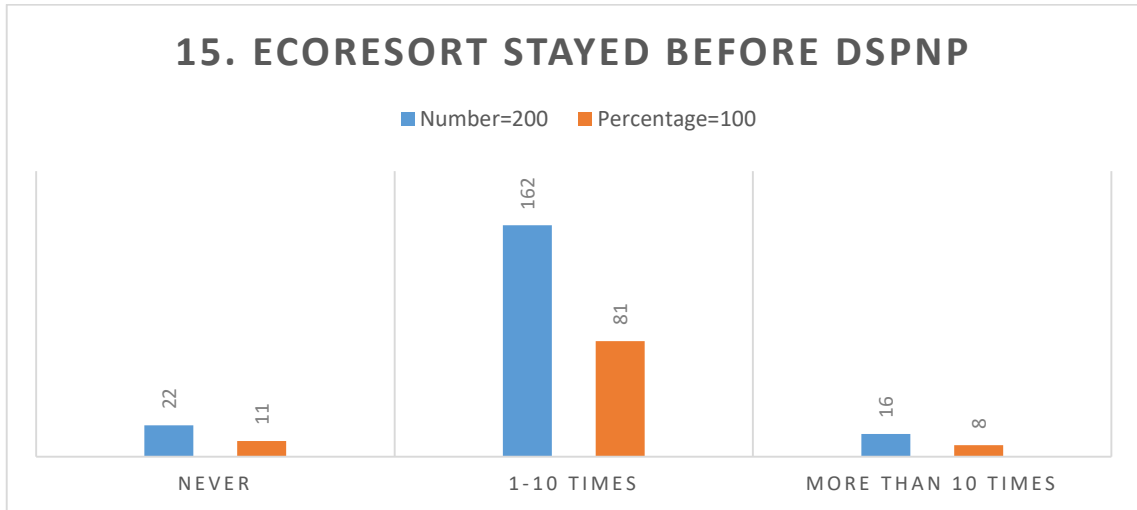


Figure 4.34 Number and percentage of tourist stayed at ecolodge before DSPNP

p. Interest in ecotourism activities

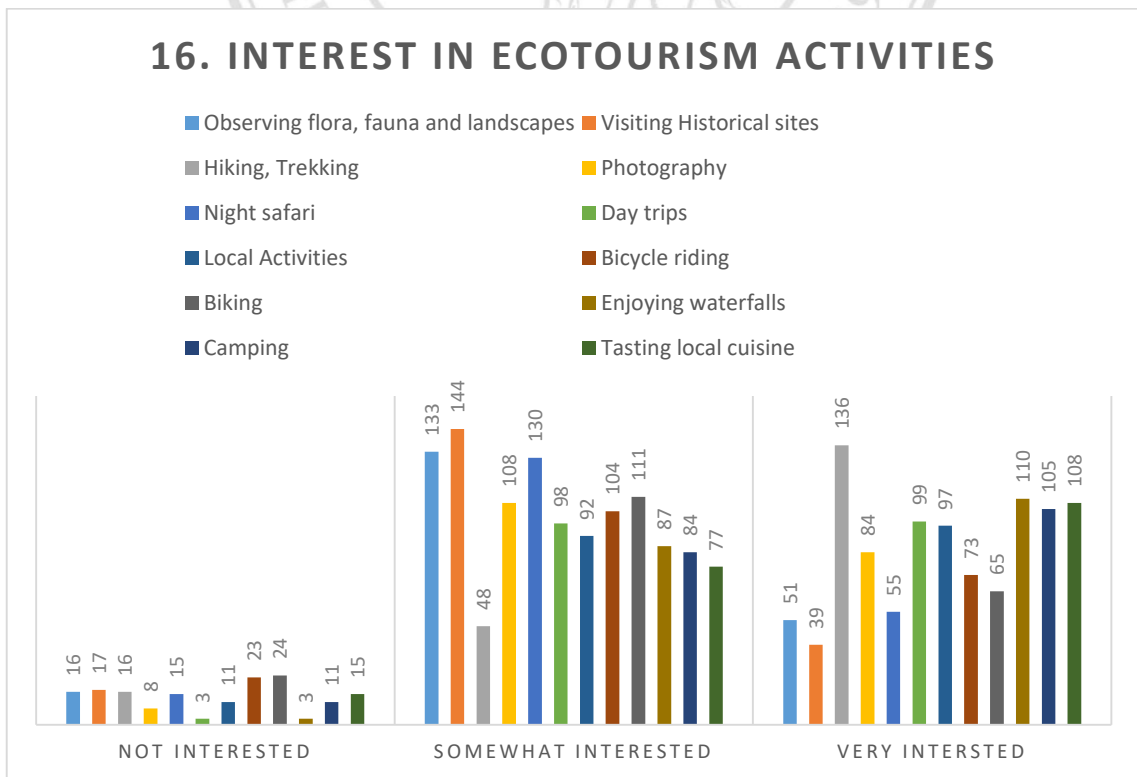


Figure 4.35 Number of tourist and their interest in ecotourism activities in DSPNP

Figure 4.35 above shows that among 200 tourists 136 were very interested in hiking and trekking, 110 were very interested in bicycle riding, 99 were very interested in day trips. 144 were somewhat interested in visiting historical sites, 133 were somewhat interested in observing flora, fauna and landscapes. 24 were not interested in biking.

q. Choosing ecotourism accommodation

Figure 4.36 below shows that among 200 tourists 74 preferred to stay at guest house, 63 preferred to stay at homestay, 18 preferred to stay at hotel motel, 14 preferred to stay at ecolodge and 12 preferred to stay at campsite.

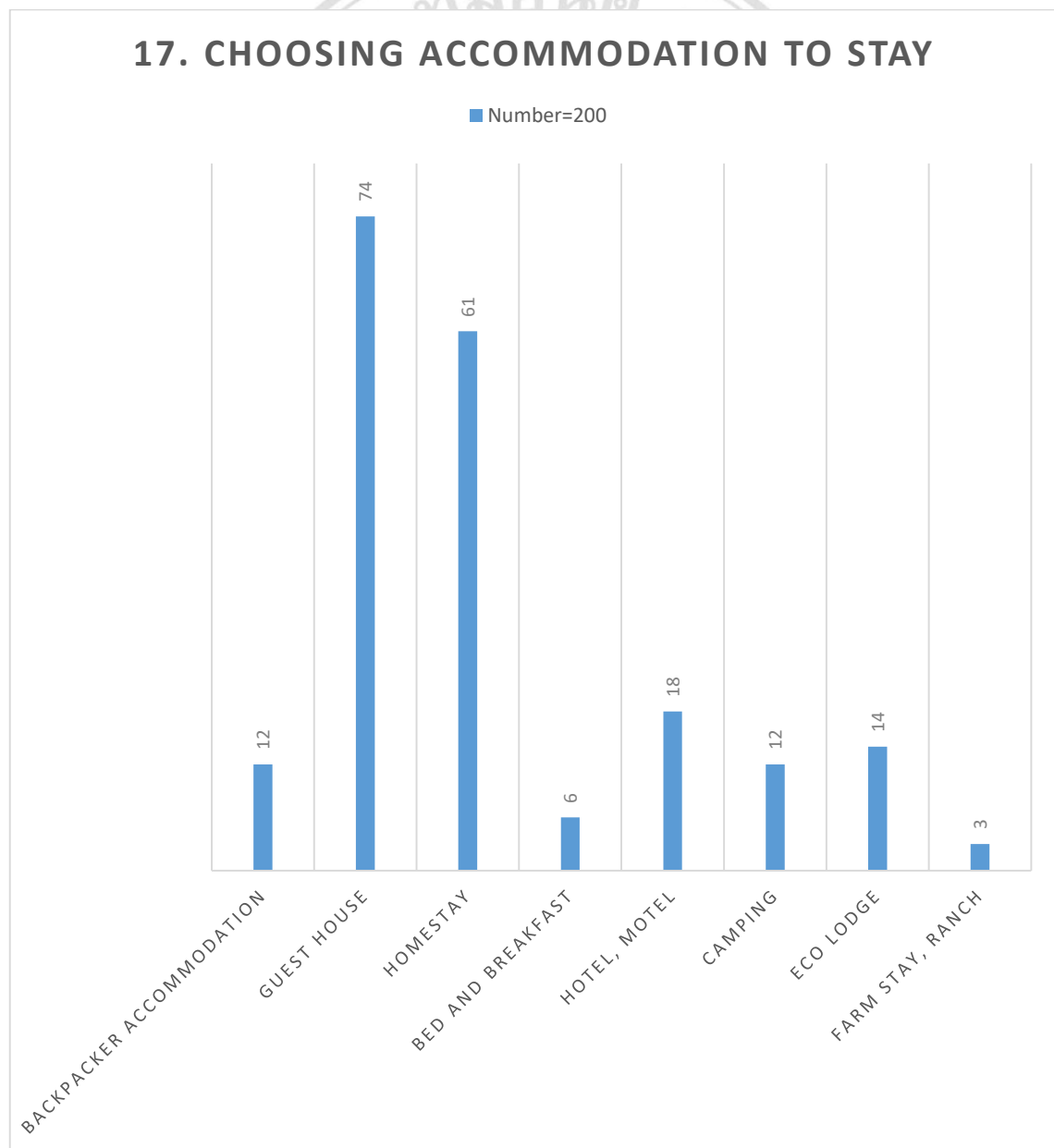


Figure 4.36 Number of tourist and their preference of ecotourism accommodation

r. Medium of travel to DSPNP

Figure 4.37 below shows that among 200 114 people used car to reach DSPNP, 58 used bike, 21 used red bus of Chiang Mai to go there, 5 used bicycle and 2 went there by walking.

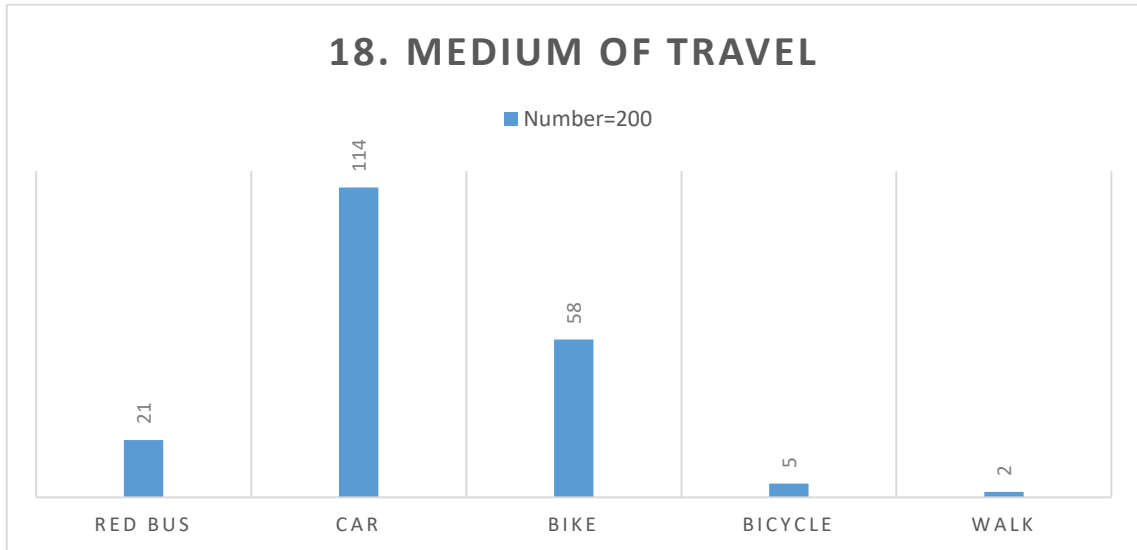


Figure 4.37 Number of medium used by tourist to reach DSPNP

s. Accommodation preferred to stay at DSPNP

Figure 4.38 below shows that among 200(100%) tourists 85(42%) preferred to stay at homestay, 60(30%) preferred ecolodge (National Park Accommodation) and 55(28%) preferred homestay.

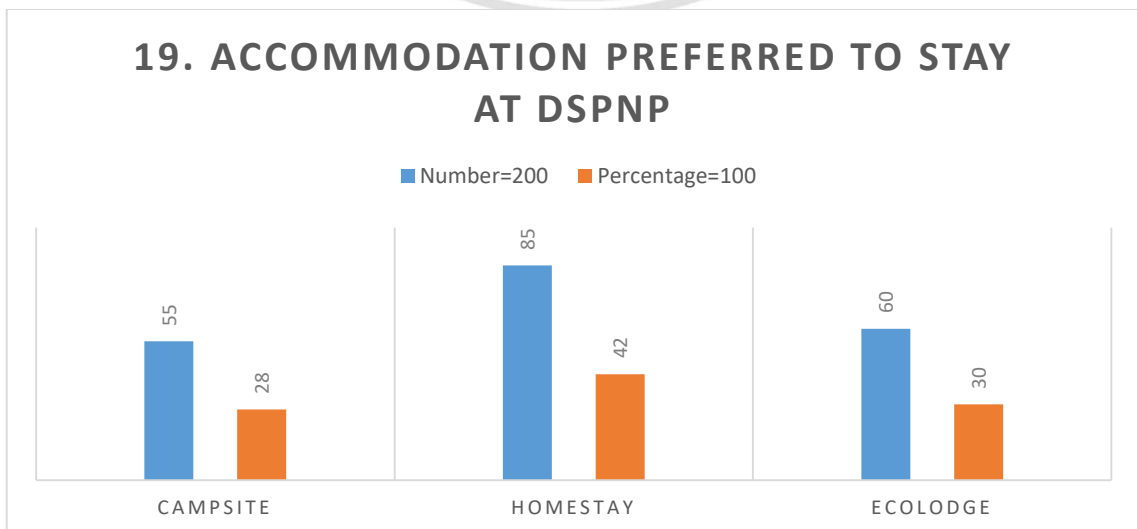


Figure 4.38 Number and percentage of tourist preference for accommodation in DSPNP

t. Architectural style of accommodation at DSPNP

Figure 4.39 below shows that among 200(100%) 78(39%) thought that style was vernacular, 62(31%) thought it was contemporary, 38(19%) thought it was modern and 22(11%) thought it was eco designed.

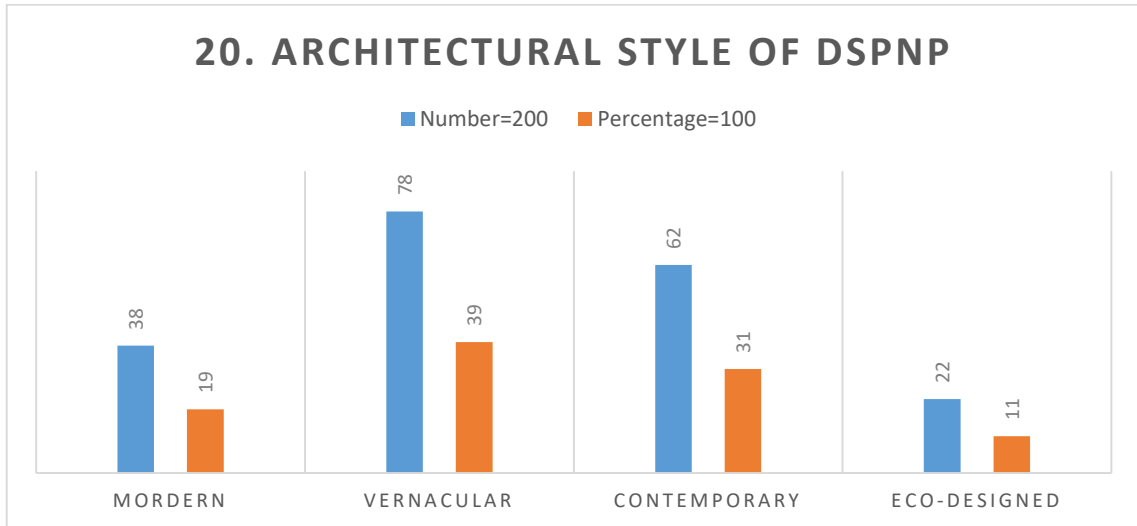


Figure 4.39 Number and percentage of tourist perception on accommodation in DSPNP

u. Location of accommodation at DSPNP

Figure 4.40 below shows that among 200(100%) 119(60%) thought that accommodation was inside city, 61(30%) thought inside village and 20(10%) thought inside jungle.

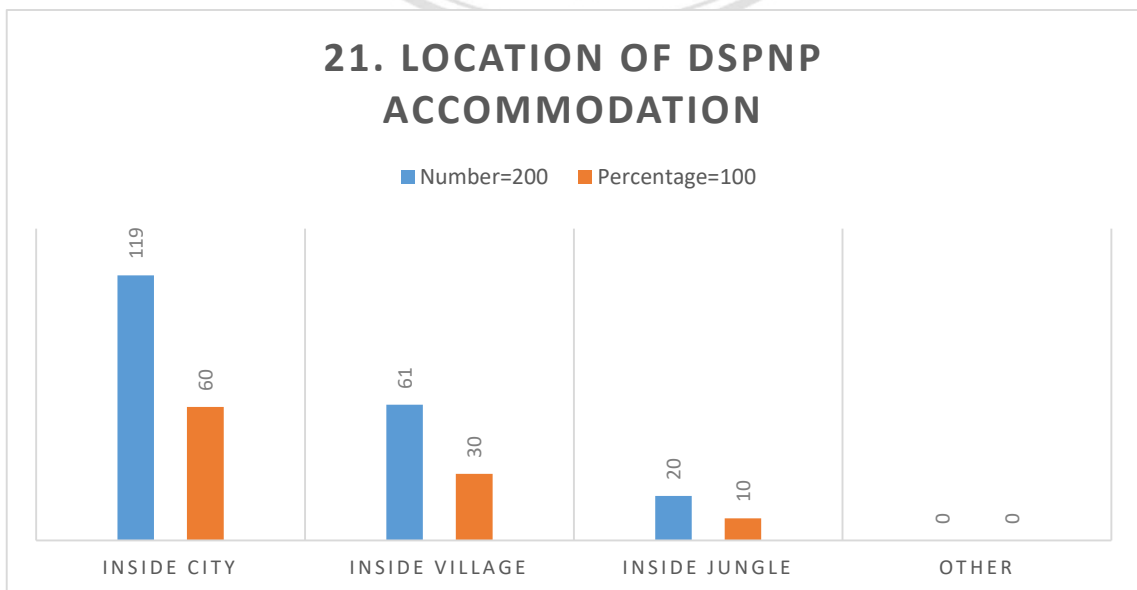


Figure 4.40 Number and percentage of tourist perception on accommodation in DSPNP

### 5.3.4 Summary of the built environment and its relationship with ecotourism activities

From the above data, it was found that tourist came to stay at Doi Suthep-Pui National Park mostly for 1 -3 days by car and bike as their travelling medium. Most of the tourist heard about Doi Suthep-Pui National park from friends and families. It was found that people chose Doi Suthep-Pui National Park because of its location, which was not far from the city and had rich eco offerings. Most of tourist had already stayed in eco resorts or eco lodge before coming to Doi Suthep-Pui National Park. Tourist were interested in ecotourism activities such as observing flora fauna and landscapes, visiting historical sites, hiking, trekking, photography etc. but most of the tourist were interested in hiking, trekking and enjoying waterfalls. For accommodation to stay most of them preferred guesthouse and homestay but in case of accommodation at Doi Suthep-Pui National Park most of them preferred to stay at homestay. Talking about the architectural perception of the tourist most of them thought that accommodation style was vernacular and contemporary and they were located inside city.

### 4.3.5 Problem analysis and eco approach

#### v. Importance of services provided by accommodation

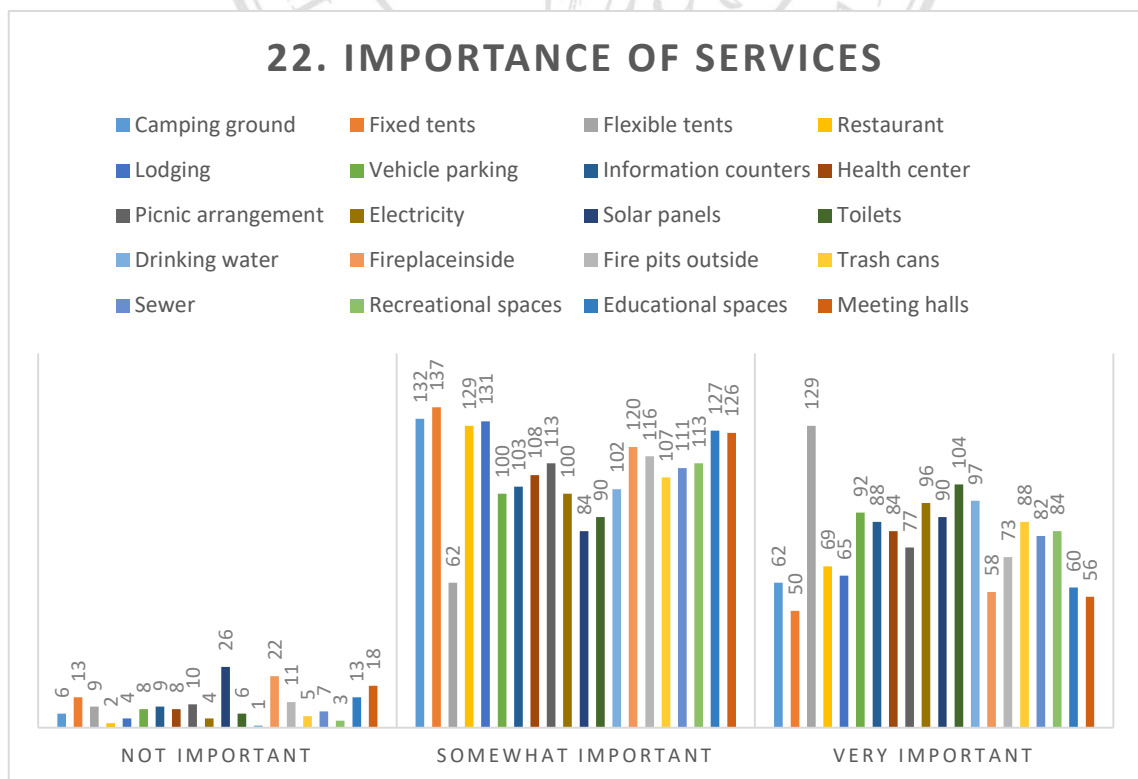


Figure 4.41 Importance of services for tourist provided by accommodation in DSPNP

Figure 4.41 above shows that among 200 tourists 129 thought flexible tents were very important in accommodation, 104 thought toilets were very important, 97 thought drinking water was very important and 92 thought vehicle parking was very important. Most of the people thought that solar panels were not important. Remaining thought that every service was somewhat important.

w. Quality of space in DSPNP

Figure 4.42 below shows that among 200 tourists few of them thought that quality of food, information counters and meeting halls were not good. Majority of them thought that quality of services provided by DSPNP were somewhat good. 93 tourist thought that quality of food was very good, 76 thought that quality of fireplace was very good and 73 thought that quality of information counters was very good.

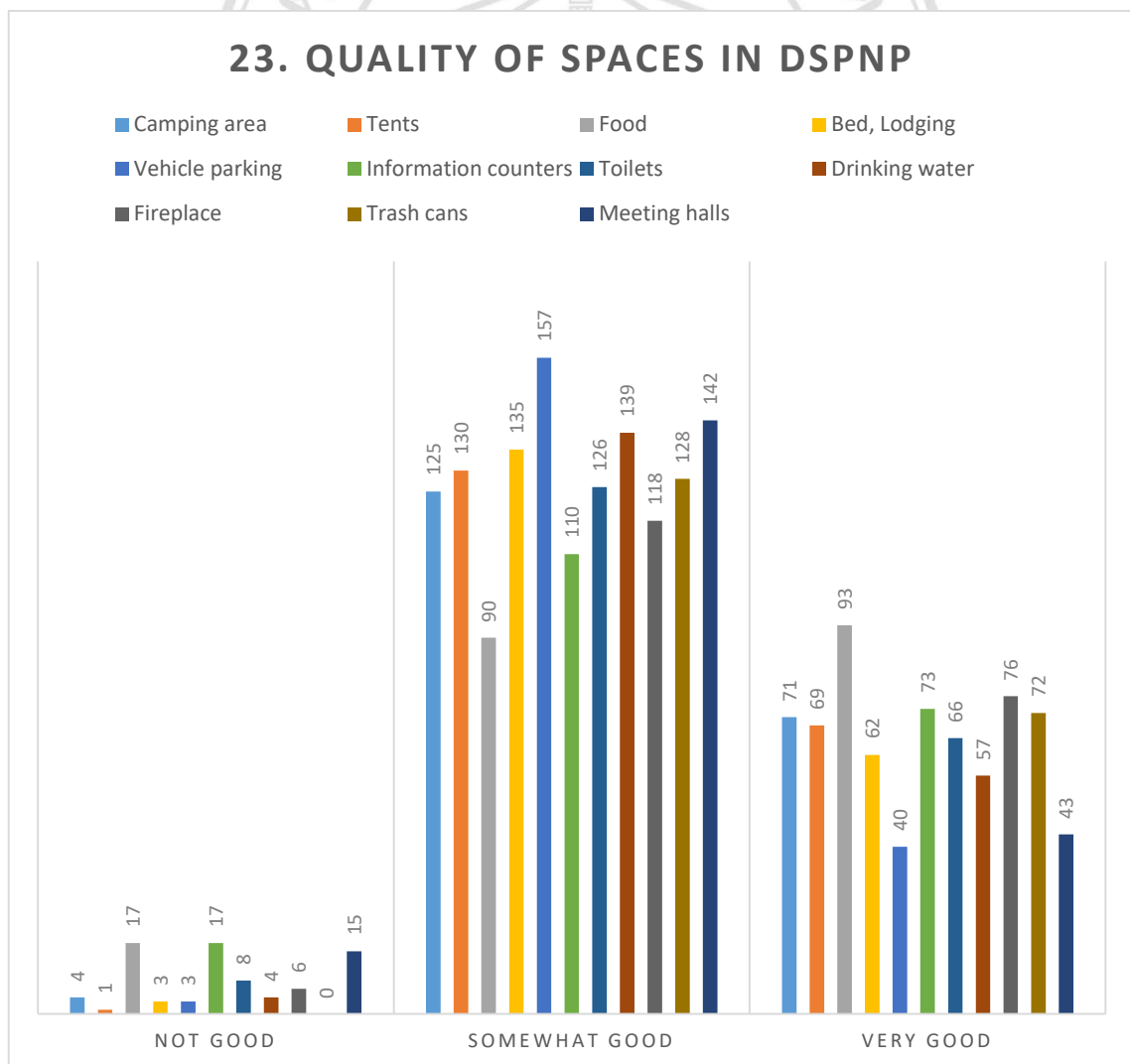


Figure 4.42 Quality of services for tourist provided by accommodation in DSPNP



x. Quality of space in DSPNP

Figure 4.43 below shows that among 200 tourists 129 of them thought that it was very important to use sustainable transportation by accommodation. 104 thought that it was very important to minimize the harmful chemicals by accommodation. 97 thought that it was very important to recycle solid waste by accommodation. 96 thought that it was very important to save important temples, trees and heritages by accommodation. Majority of tourist thought that all of them were somewhat important. But few of them (26) thought that planting trees were not important and 22 thought it was not important to recycle liquid waste by accommodation.

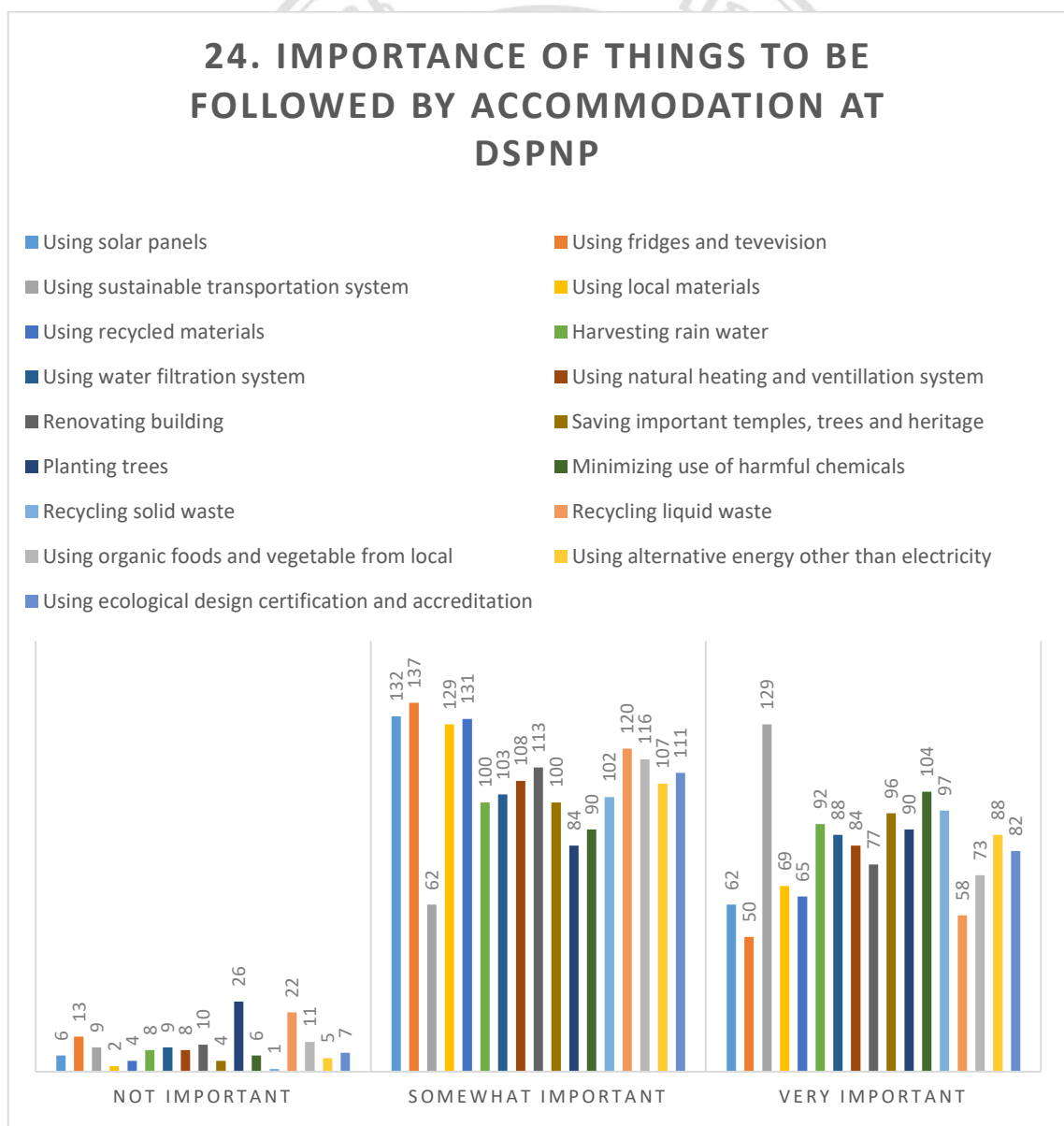


Figure 4.43 Importance of things to tourist to be followed by accommodation in DSPNP

#### 4.3.6 Summary of problem analysis and eco approach

From the above data, it was found that majority of services provided by Doi Suthep-Pui National Park were somewhat important. Services were camping ground, fixed tents, flexible tents, restaurant, lodging, vehicle parking, information counters, health centers, picnic arrangement, electricity, solar panels, toilets, drinking water, fireplace inside, fire pits outside, trash cans, sewer, recreational spaces, educational spaces and meeting halls. Provision of flexible tents, toilets, drinking and vehicle parking was very important. Tourist said that foods, information counters and meeting halls were not good, whereas quality of fireplace and drinking water was very good. Remaining were somewhat good in quality. Spaces were camping area, tents, food, bed/lodging, vehicle parking, information counters, toilets, drinking water, fireplace, trash cans and meeting halls. It was found that it is very important to use sustainable transportation by accommodation. It is also important to minimize the harmful chemicals, recycle solid waste and save important temples, trees and heritages by accommodation, whereas some argued that planting trees and recycling liquid waste were not important things to be followed by accommodation.

#### 4.3.7 Tourist's satisfaction and opinion on built structures

##### y. Learning local culture

Figure 4.44 below shows that among 200(100%) tourists 127(63%) were somewhat interested in learning local culture of DSPNP, 63(32%) were very interested and 10(5%) were not interested

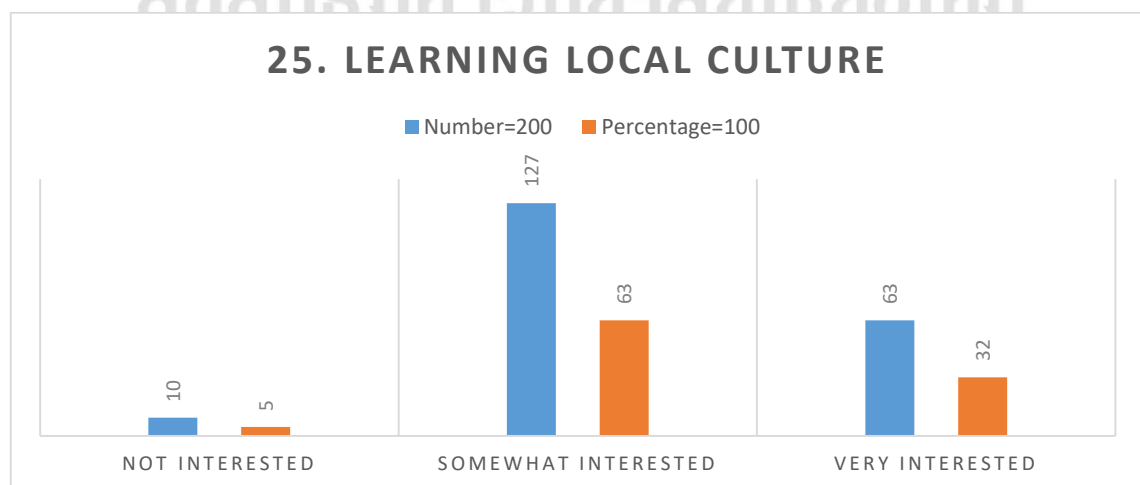


Figure 4.44 Number and percentage of tourist interest in learning local culture

z. Learning history of DSPNP

Figure 4.45 below shows that among 200(100%) tourists 107(53%) were very interested in learning history of DSPNP, 70(35%) were somewhat interested and 23(12%) were not interested.

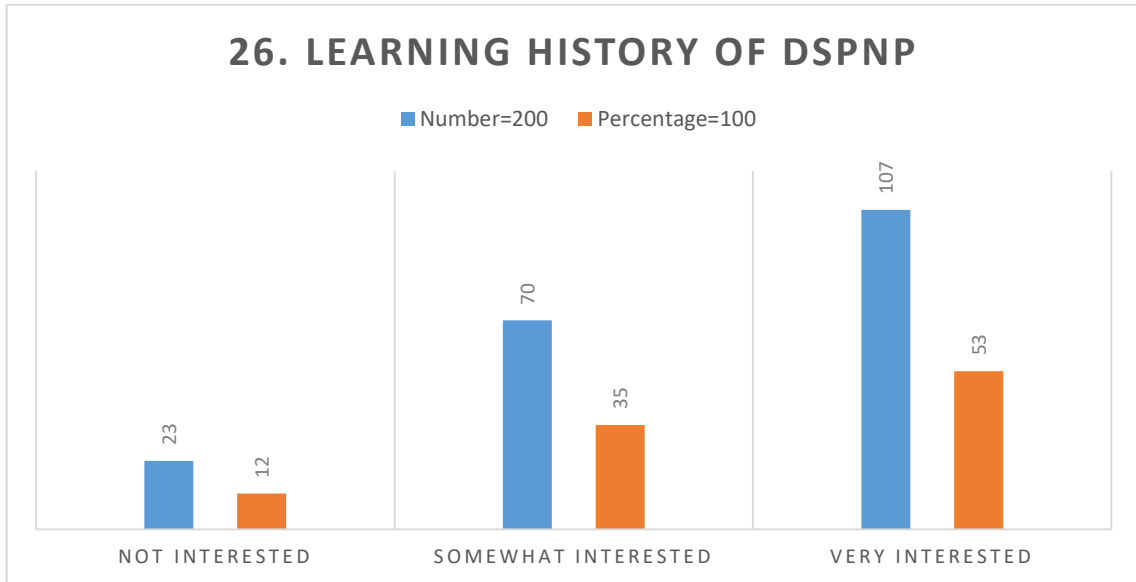


Figure 4.45 Number and percentage of tourist interest in learning history of DSPNP

aa. Learning about social and environmental issues of DSPNP

Figure 4.46 below shows that among 200(100%) tourists 125(63%) were very interested in learning about social and environmental issues of DSPNP, 68(34%) were somewhat interested and 7(3%) were not interested.

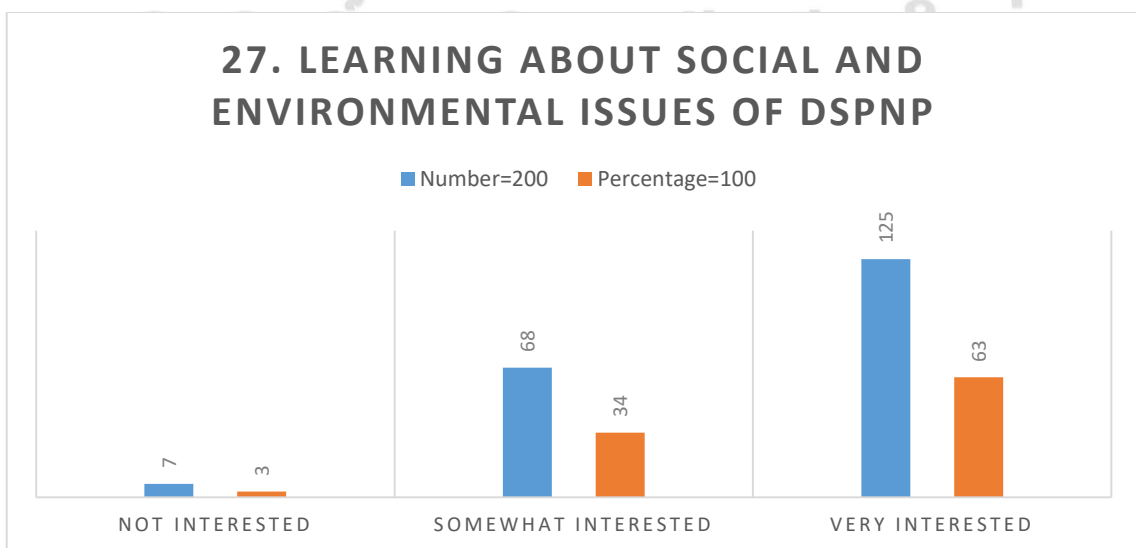


Figure 4.46 Number and percentage of tourist interest in learning SCE issues of DSPNP

bb. Satisfaction on trip

Figure 4.47 below shows that among 200(100%) tourists 122(56%) were very satisfied from trip to DSPNP, 86(43%) were somewhat satisfied and 2 (1%) were dissatisfied.

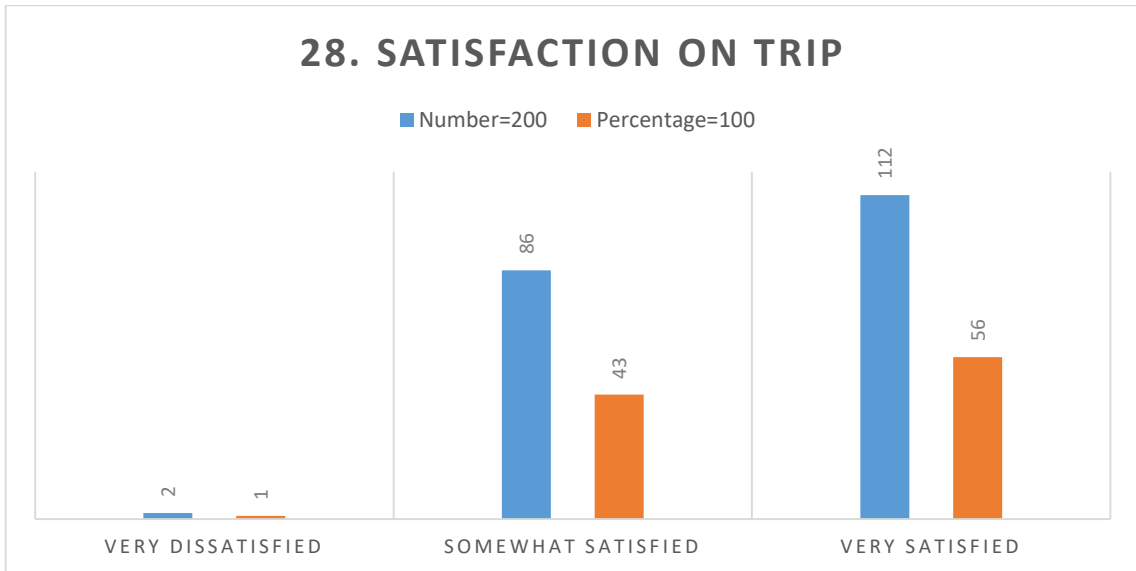


Figure 4.47 Number and percentage of tourist satisfaction on trip to DSPNP

cc. Recommendation to family and friends

Figure 4.48 below shows that among 200(100%) tourists 146(73%) were going to recommend DSPNP to friends and family, 52(26%) possibly and 2 (1%) were not going to recommend.

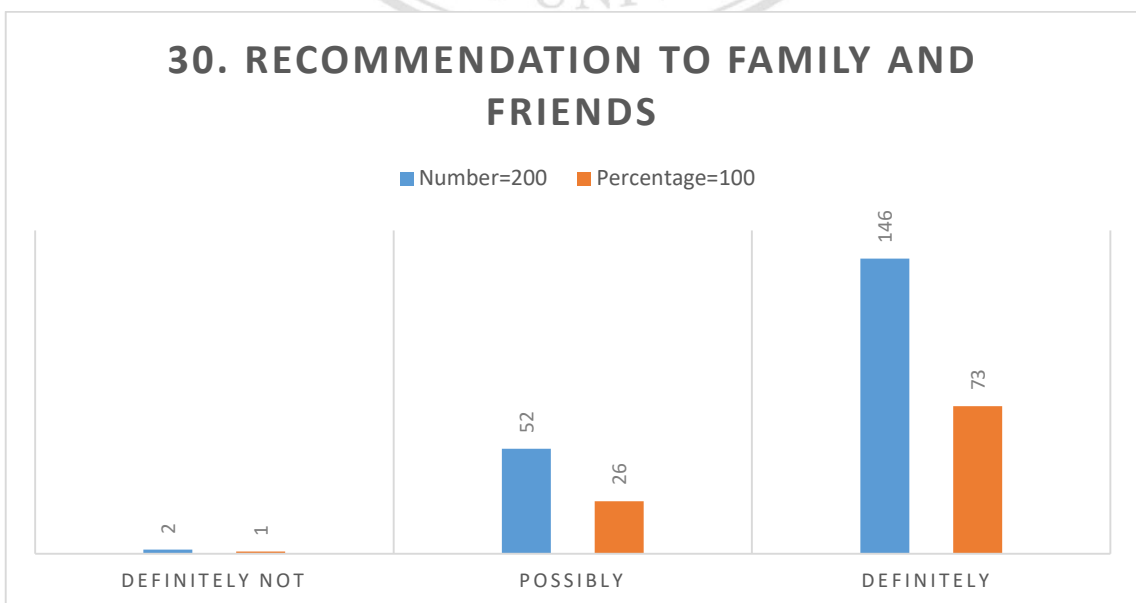


Figure 4.48 Number and percentage of tourist recommending DSPNP to friends

#### 4.3.8 Summary of tourist's satisfaction and opinion on built structures

From the above data, it was found that tourists were very interested in learning history and social and environmental issues of Doi Suthep-Pui National Park and somewhat interested in learning local culture. Tourists were very satisfied with the trip and going to recommend Doi Suthep-Pui National Park to family and friends.

#### 4.4 Results from Interviewing

Researcher started interviewing with policy makers and architects from 22<sup>nd</sup> September 2016 to find policies and problems regarding accommodation for ecotourism in Doi Suthep-Pui National Park. Total 20 open ended enquiries were asked. The summary of interviewing with everyone were written and recorded using cell phone. Interviewing mainly focused on correlation between ecotourism accommodation, architecture and built environment. Interviews was done with

- i. 4 Policy Makers
- ii. 3 Architects and Planners
- iii. 1 Professor

##### 4.4.1 Results of Interviewing Policy Makers

One month after interviewing four policy makers, researcher had found important issues regarding ecotourism and accommodation in Doi Suthep-Pui National Park. So, from interview questionnaires researcher found among 127 national parks in Thailand Doi Suthep-Pui is one of the national park located in a mountainous geographic location. In their opinion Khao Yai national Park is the most famous one because it is very near to Bangkok. Doi Suthep-Pui National Park is famous for temples, waterfalls and viewpoints. People travel Doi Suthep-Pui for natural and ecotourism activities but return to Chiang Mai city to stay because the national park is not far from city. Every national park including Doi Suthep-Pui National Park have specific zoning in which accommodation are only allowed to build in the service zone. About the number of visitors to Doi Suthep-Pui National Park, they are claiming it is increasing but they are unable to count every person, where researcher has found it decreased annually from the data. The total capacity of accommodation (700 per night) is the maximum carrying capacity of accommodation in Doi Suthep-Pui national park so there is no any plans and policies on creating new area for accommodation. Only homestay can be constructed within their own house by

renovating it. Renovation of the existing building and accommodation are allowed but should meet the design criteria as well as national park criteria. For the conservation of natural and cultural heritage, wildlife, flora and fauna national park should strictly follow conservation guidelines defined by Department of National Park Thailand. For making any policies, Tourism Authority of Thailand, Department of National Park and Department of Tourism and Sports are mainly responsible. Tourism Authority gives information for the tourists, Department of Tourism and Sports collaborate with local people and community to educate about tourism and Department of National Park is responsible for everything that happens in national parks. For now, Doi Suthep-Pui National Park is developing Android Apps to inform tourist and collaborating with local community to teach and develop homestay tourism. For the transportation and other infrastructure development the related authorities are positive. From now on they are trying to control number of tourist and focusing on giving quality services at every national park including Doi Suthep-Pui National Park.

i. Summary of interview with Mr. Kritsayarm Kongsatree

On 23<sup>rd</sup> September 2016, around 9 am Mr. Kritsayarm Kongsatree 47 year of age (Forestry Technical Officer, Senior Professional Level at Doi Suthep-Pui National Park) was interviewed. He was one of the policy makers and very well informed with all the aspects in Doi Suthep-Pui National Park. When he was asked how many times he been to Doi Suthep-Pui National Park, he replied he had visited Doi Suthep Pui National Park more than 50 times and knew everything about the national park. Most of the time he travelled to Doi Suthep-Pui National Park by personal car and red taxi of Chiang Mai but he wanted to see electric vehicles and electric public transportation going to the top in Future. From the recent data from Department of National Park, Thailand, there were 285,915 visitors to Doi Suthep Pui National Park. From field survey and questionnaires researcher found that the total capacity of 4 accommodations in Doi Suthep-Pui National Park was 700 per night. When asked upon a question that what should be the capacity of accommodation he replied the total capacity of accommodation was more than enough. He said that the national park already fixed the total capacity of accommodation and not going enlarge existing accommodation and add new place for accommodation. In his opinion Khao Yai National Park was the most famous national park in Thailand because it was first national park of Thailand and located very near to Bangkok. He told that he

was very interested in visiting Doi Suthep-Pui National Park for ecotourism purposes, participating in ecotourism activities, staying at accommodation provided by national park, knowing the history, involving in conservation activities, developing sustainable tourism practices and improving existing tourism infrastructures. He also added he was very interested in making policies over those activities. Most of the tourist attraction places in Thailand are managed by national park including Doi Suthep-Pui National Park. When asked upon what are the policies of national park in Thailand he replied that every national park had basic policy which were national park should protect nature, wildlife and environment, should allow to research on ecosystem and promote tourism. He explained those policies were for all the national parks in Thailand. From site survey and questionnaires, researcher had found that the number of tourist travelling to Doi Suthep-Pui was decreasing by 70% from 2005 to 2015 and it was found that among travelers Thai were more than international. When asked upon the question about the figures he denied to say that number was decreasing. He explained number was increasing by saying they used to count each person travelling to Doi Suthep-Pui National Park as a tourist but then they decided to count people coming to four places Monthathan Waterfall, Mae Sa Waterfall, Tad Mok Waterfall and Mok Fa Waterfall. Which made the number of accounted tourist fall sharply but he said the number was increasing. He believed that the number of tourist should be around 3 million. Answering the question about ratio he told that Thai people travelled more to Doi Suthep- Pui National Park because of Phra That Doi Suthep Temple and Bhubing Palace. International tourist coming to Thailand like to visit beach rather than hills he added. When asked upon what were the upcoming plan and projects he replied their plans were promoting tourism, developing tourist site and its quality, increasing ecotourism activities and employing more staffs. They did zoning to protect and conserve the existing forest, village and accommodation but there was no any plans and projects for extending the present area for accommodation and making a new place for accommodation. He explained mostly young travelers goes for hiking, trekking and so there are some projects to develop nature trails for trekking. When asked upon the price of stay at accommodation in Doi Suthep-Pui National Park, which was 3000 baht for 2 persons per night, he replied tourist just wanted to travel national park and stay in Chiang Mai City because Chiang Mai city offer more facilities in 3000 Baht per night, which is luxurious. He explained around 10 million baht was their annual income from

national park and 20% of that goes to renovation and restoration of national park. During low seasons, they managed national park by cleaning and renovating. From the questionnaire researcher found that the information provided by national park was not enough so in an answer he accepted the information provided was low and they were trying to develop Android application for giving information and planning to open a new visitor center. It was clear to the researcher that from the field survey and questionnaire local people living in Doi Suthep-Pui National were not interested in ecotourism activities but when asked upon a question about that he replied local were very interested in activities and were participatory. He explained with the example of bicycling and marathon in Doi Suthep-Pui National Park. Finally, he added the national park is developing the current infrastructure such as road and accommodation to give better quality and finding a new way of transportation such as electric cars rather than cable cars. In his opinion waste and pollution generated by tourist was the main problem of national park and he recommended to give more information on that. He was very positive and satisfied with the ecotourism program offered by Doi Suthep-Pui National Park.

ii. Summary of interview with Mrs. Pawilai Chalamat

On 23<sup>rd</sup> September 2016, around 12 am Mrs. Pawilai Chalamat 29 year of age (Plan and Policy Analyst, Practitioner Level at Chiang Mai Provincial Office of Tourism and Sports) was interviewed. She was one of the policy makers and involved in tourism and recreation in Chiang Mai from several years. When she was asked how many times she been to Doi Suthep-Pui National Park, she replied she had visited Doi Suthep temple but never been to Doi Pui campsite and to reach there she used red taxi of Chiang Mai. From the recent data from Department of National Park, Thailand, there were 285,915 visitors to Doi Suthep Pui National Park. From field survey and questionnaires researcher found that the total capacity of 4 accommodations in Doi Suthep-Pui National Park was 700 per night. When asked upon a question that what should be the capacity of accommodation she replied with the total capacity of accommodation should be around 1000 per night. She also added she did not have that much idea about the rules and regulation of the national park. In her opinion Khao Yai National Park was the most famous national park in Thailand because it was first national park of Thailand and third largest national park of Thailand. She told that he was somewhat interested in visiting Doi Suthep-Pui National



Park for ecotourism purposes, participating in ecotourism activities, staying at accommodation provided by national park, knowing the history, involving in conservation activities, developing sustainable tourism practices and improving existing tourism infrastructures. She also added she was very interested in making policies over those activities. Most of the tourist attraction places in Thailand are managed by national park including Doi Suthep-Pui National Park. When asked upon what are the policies of national park in Thailand she replied that every national park should be a touristic place for tourism, inform and collect information to and from tourist and support ecotourism activities. She explained those policies were for all the national parks in Thailand from the Department of Tourism and Sport. From site survey and questionnaires, researcher had found that the number of tourist travelling to Doi Suthep-Pui was decreasing by 70% from 2005 to 2015 and it was found that among travelers Thai were more than international in a ratio of 3:1. When asked upon the question about the figures she replied it might be because of accommodation over there and interest of tourist. Answering the question about ratio she told that Thai people travelled more to Doi Suthep-Pui National Park because of Phrathat Doi Suthep Temple and Bhubing Palace and of the interest of tourist. When asked upon what were the upcoming plan and projects he replied their plans were promoting community based tourism, developing good relation with public and owner of homestay and develop attraction and promoting it. She explained there was no any plans and projects for extending the present area for accommodation and making a new place for accommodation. She added this decision was one and only of Department of National Park. She explained mostly young travelers goes for hiking, trekking and biking in Doi Suthep-Pui National Park. When asked upon the price of stay at accommodation in Doi Suthep-Pui National Park, which was 3000 baht for 2 persons per night, she replied tourist just wanted to travel national park and stay in Chiang Mai City because Chiang Mai city offer more facilities in 3000 Baht per night, which is luxurious. She explained this issues was because accommodation at Doi Suthep-Pui National Park was not providing good services and needed to increase facilities. During low seasons, she said national park should be managed by cleaning, renovating and leave forest to grow naturally. From the questionnaire researcher found that the information provided by national park was not enough so in an answer she said it might be because of lack of marketing strategies. It was clear to the researcher that from the field survey and

questionnaire local people living in Doi Suthep-Pui National Park were not interested in ecotourism activities but when asked upon a question about that she replied local were not realizing the importance of ecotourism. She explained community collaborative works were needed and needed to build awareness of importance of tourism to locals. Finally, she added the national park should provide sustainable transportation but should respect the culture and identity of the place. In her opinion waste and pollution generated by tourist was the main problem of national park and she recommended to manage trash point on national park. She suggested national park should collaborate with local and organize events and programs together.

iii. Summary of interview with Mr. Ariya Chouchom

On 11<sup>th</sup> October 2016, around 1 pm Mr. Ariya Chouchom 46 year of age (Director of Tourism and Recreation Division at Department of National Park, Thailand) was interviewed. He was one of the head policy makers and very well informed with all the aspects and issues in Doi Suthep-Pui National Park. When he was asked how many times he been to Doi Suthep-Pui National Park, he replied he had visited Doi Suthep Pui National Park more than 20 times. Most of the time he travelled to Doi Suthep-Pui National Park by personal car. From the recent data from Department of National Park, Thailand, there were 285,915 visitors to Doi Suthep Pui National Park. From field survey and questionnaires researcher found that the total capacity of 4 accommodations in Doi Suthep-Pui National Park was 700 per night. When asked upon a question that what should be the capacity of accommodation he replied the total capacity of accommodation was more than enough. He said that the national park already fixed the total capacity of accommodation and not going enlarge existing accommodation and add new place for accommodation. In his opinion Khao Yai National Park was the most famous national park in Thailand because it was first national park of Thailand and located very near to Bangkok and with a diverse wildlife and plants. He said that Doi Suthep-Pui National Park is more famous because of Phrathat Doi Suthep Temple. He told that he was very not interested in visiting Doi Suthep-Pui National Park for ecotourism purposes and staying at accommodation provided by national park but he was somewhat interested in knowing the history, involving in conservation activities, developing sustainable tourism practices and improving existing tourism infrastructures. He also added he was very interested in making policies over those activities. Most of the tourist attraction places in

Thailand are managed by national park including Doi Suthep-Pui National Park. When asked upon what are the policies of national park in Thailand he replied the same thing as Mr. Kritsayarm Kongsatree that every national park had basic policy which were national park should protect nature, wildlife and environment, should allow to research on ecosystem and promote tourism. He explained those policies were for all the national parks in Thailand but varies with some specific objectives such as for Doi Suthep-Pui National Park should preserve nature based tourism and promote it along with cultural tourism. From site survey and questionnaires, researcher had found that the number of tourist travelling to Doi Suthep-Pui was decreasing by 70% from 2005 to 2015 and it was found that among travelers Thai were more than international in a ratio of 3:1

When asked upon the question about the figures he denied to say that number was decreasing. He explained same thing as Mr. Kritsayarm that number was increasing by saying they used to count each person travelling to Doi Suthep-Pui National Park as a tourist but then they decided to count people coming to four places Monthathan Waterfall, Mae Sa Waterfall, Tad Mok Waterfall and Mok Fa Waterfall. Which made the number of accounted tourist fall sharply but he said the number was increasing. He also believed that the number of tourist should be around 3 million. Answering the question about ratio he told that Thai people travelled more to Doi Suthep- Pui National Park because of Phrathat Doi Suthep Temple and Bhubing Palace and because of cultural reasons. When asked upon what were the upcoming plan and projects he replied their plans were promoting tourism, developing tourist site and its quality but not going to invest on buildings and accommodation. They did zoning to protect and conserve the existing forest, village and accommodation but there was no any plans and projects for extending the present area for accommodation and making a new place for accommodation.

Only thing he said was Department of National Park would allow to renovate existing accommodation but no expansion. He explained mostly young travelers goes for hiking, trekking and nature walk. When asked upon the price of stay at accommodation in Doi Suthep-Pui National Park, which was 3000 baht for 2 persons per night, he replied tourist just wanted to travel national park and stay in Chiang Mai City because Chiang Mai city offer more facilities in 3000 Baht per night, which is luxurious. During low seasons, they managed national park by cleaning and renovating. From the questionnaire researcher found that the information provided by national park was not enough so in an answer they

were trying to develop Android application for giving information and planning to open a new visitor center. New souvenirs shops and retail shops inside national park was the next target but in an existing village not allowed new building to construct. It was clear to the researcher that from the field survey and questionnaire local people living in Doi Suthep-Pui National were not interested in ecotourism activities but when asked upon a question about that he answered that might because of no visitor center and language barrier so they were not communicating with tourist. Finally, he added the national park is developing the current infrastructure such as road and accommodation to give better quality and finding a new way of transportation such as electric cars rather than cable cars. For the cable cars, he added there should be a high-level research on impacts of it on environment. In his opinion waste and pollution generated by tourist was the main problem of national park and he recommended to give more information on that. He concluded that the department of national park have strict rules and do not allow any kind of new accommodation inside the national park area but on the buffer zone accommodation like eco resorts and lodge are allowed. But national park can allow to build homestay in existing village inside national park.

iv. Summary of interview with Mr. Prommate Nathonthong

On 18<sup>th</sup> October 2016, around 1 pm Mr. Prommate Nathonthong 46 year of age (Executive Director, Tourism Products and Promotion Department at Tourism Authority of Thailand) was interviewed. He was one of the head policy makers and responsible for addressing tourism issues in Thailand. When he was asked how many times he been to Doi Suthep-Pui National Park, he replied he had visited Doi Suthep Pui National Park more than 20 times. Most of the time he travelled to Doi Suthep-Pui National Park by personal car and sometimes he used red bus of Chiang Mai. From the recent data from Department of National Park, Thailand, there were 285,915 visitors to Doi Suthep Pui National Park. From field survey and questionnaires researcher found that the total capacity of 4 accommodations in Doi Suthep-Pui National Park was 700 per night.

When asked upon a question that what should be the capacity of accommodation he replied the total capacity of accommodation was more than enough. So, national park should not increase the capacity of accommodation. In his opinion Mu Koh Similan National Park was the most famous national park in Thailand because it was in marine area and had a lot of beach. He said that Doi Suthep-Pui National Park is more famous

because of Phrathat Doi Suthep Temple and hill tribe Hmong people. He told that he was very interested in visiting Doi Suthep-Pui National Park for ecotourism purposes and staying at accommodation provided by national park, knowing the history, involving in conservation activities, developing sustainable tourism practices and improving existing tourism infrastructures. He also added he was very interested in making policies over those activities. Most of the tourist attraction places in Thailand are managed by national park including Doi Suthep-Pui National Park.

When asked upon what are the policies of national park in Thailand he replied that national park in Thailand should implement sustainable tourism and work on balancing carrying capacity. And these policies were different for every national park in Thailand. From site survey and questionnaires, researcher had found that the number of tourist travelling to Doi Suthep-Pui was decreasing by 70% from 2005 to 2015 and it was found that among travelers Thai were more than international in a ratio of 3:1. When asked upon the question about the figures he denied to say that number was decreasing. He explained same thing as Mr. Kritsayarm that number was increasing by saying they used to count each person travelling to Doi Suthep-Pui National Park as a tourist but then they decided to count people coming to four places Monthathan Waterfall, Mae Sa Waterfall, Tad Mok Waterfall and Mok Fa Waterfall. Which made the number of accounted tourist fall sharply but he said the number was increasing. He also believed that the number of tourist should be around 3 million. Answering the question about ratio he told that Thai people travelled more to Doi Suthep- Pui National Park because of Phrathat Doi Suthep Temple and Bhubing Palace, near from Chiang Mai city and because of cultural reasons. When asked upon what were the upcoming plan and projects he replied their plans were controlling the per day expenditure of tourists, promoting tourism, developing tourist site and its quality with local experience and promoting local products.

He was unaware of projects for extending the present area for accommodation and making a new place for accommodation in Doi Suthep-Pui National Park. He explained mostly young travelers goes for educational tours, hiking, trekking and nature walk. When asked upon the price of stay at accommodation in Doi Suthep-Pui National Park, which was 3000 baht for 2 persons per night, he replied tourist just wanted to travel national park and stay in Chiang Mai City because Chiang Mai city offer more facilities in 3000 Baht per night, which is luxurious. He added people who really loved nature would only

travelled Doi Suthep-Pui National Park. During low seasons, his opinion was not to touch the nature or leave them allow to grow by themselves.

From the questionnaire researcher found that the information provided by national park was not enough so in an answer they were trying to develop Android application for giving information and updating information. It was clear to the researcher that from the field survey and questionnaire local people living in Doi Suthep-Pui National Park were not interested in ecotourism activities but when asked upon a question about that he answered that might because local people were afraid of government. He cleared that for physical planning Tourism Authority of Thailand is not involved. It only works with community and project related to information. In his opinion, for the cable cars he added there should be a high-level research on impacts of it on environment. In his opinion waste and pollution generated by tourist was the main problem of national park and he recommended to educate tourist on that. He was very positive in developing policies of ecotourism in Doi Suthep-Pui National Park.

#### **4.4.2 Results of Interviewing Architects, Urban Planners and Conservationist**

One month after interviewing three architects and urban planners, researcher has found important guidelines for designing accommodation for ecotourism in Doi Suthep-Pui National Park. So, from interview inquiries among 127 national parks in Thailand Doi Suthep-Pui National Park is one of the national park located in a mountainous geographic location. In their opinion Khao Yai national Park and Mu Koh Similan National Park are the most famous one. Doi Suthep-Pui National is famous because of temple, cool weather and located on hillside. From an architect perspective, the total capacity of accommodation is 700 per night is quite enough because it is more of a natural site. The current buildings in accommodation are not blended with local architectural style of the place. Traditional and vernacular architecture style with local materials should be the architectural style of accommodation in Doi Suthep-Pui National Park. Big scale development are not suitable so small scale or medium scale development up to 50 bedrooms are appropriate. The policy of national park does not allow to build new accommodation but in case they change the policy it is better to locate accommodation on the slope of the hill from where people can enjoy views. The national park suggested it's better to design buildings in buffer zone of national park which are the foot of the hills. It should have minimal impacts to the nature and surrounding places and should

follow the principles of ecotourism. Material of constructing buildings should be local materials such as woods, bamboo, pines and thatch roof in a local Thai Lanna style. In case of materials fake materials can be used but not in all place. Night trekking and nature trekking should be added in the list of ecotourism activities to promote ecotourism. The additional source of energy should be solar and wind along with electricity. For sustainable transportation, electric cars should be used. For water supply small dams and terrace distributing system should be adopted. For saving water rainwater system should be used and grey water treatment should be done. Small health clinic for tourist as well as local is required in Doi Suthep-Pui National Park. For controlling solid waste trash cans should be provided and liquid waste should be connected to the municipal pipeline of Chiang Mai. No any architects suggested to build waste management area inside national park. The building should be designed in a low rise and flow of space should be directly connected to nature. Zoning should be done for the fire protection.

v. Summary of interview with Dr. Rattapong Angkasith

On 22<sup>nd</sup> September 2016, around 10 am Dr. Rattapong Angkasith 38 year of age (Professor at Faculty of Architecture Chiang Mai University) was interviewed. He was one of the local architects in Chiang Mai and teaching architecture in Chiang Mai University for a long time. When he was asked how many times he been to Doi Suthep-Pui National Park, he replied he had visited Doi Suthep-Pui National Park more than 5 times. Most of the time he travelled to Doi Suthep-Pui National Park by personal car. From the recent data from Department of National Park, Thailand, there were 285,915 visitors to Doi Suthep-Pui National Park. From field survey and questionnaires researcher found that the total capacity of 4 accommodations in Doi Suthep-Pui National Park was 700 per night. When asked upon a question that what should be the capacity of accommodation he replied the total capacity of accommodation was okay to be 700 per night. He thought it should not be more than 700 per night. In his opinion Mu Koh Similan National Park was the most famous national park in Thailand because it was located in marine area and had a lot of beach. He said that Doi Suthep-Pui National Park was famous because of cool climate and Phrathat Doi Suthep temple. He told that he was somewhat interested in visiting Doi Suthep-Pui National Park for ecotourism purposes, staying at accommodation provided by national park, knowing the history, involving in conservation activities, developing sustainable tourism practices and improving existing

tourism infrastructures. He also added he was very interested in designing architecture over those activities. From the site survey researcher found that architecture style of buildings in Doi Suthep-Pui National Park were mostly vernacular and contemporary (mixed Thai Lanna and with modern materials). They were small scale and mostly located inside jungle. Building materials were commonly brick, concrete, timber, concrete tiles, and thatch. Construction techniques were modern more than vernacular except homestay. When asked upon a question that what was his opinion on accommodation styles merged with local architecture he replied it was not really. In his opinion he wanted to see more vernacular style and environment friendly green building styles. He added there was no need of big scale development. He thought that both renovating existing accommodation and creating new area for accommodation were good options but should be careful on the impacts to nature and local people. He added for the conservation national park should be more careful on carrying capacity. He suggested accommodation in Doi Suthep-Pui National Park should be designed in a simple and open manner and flow of space should be connected directly to nature. His recommendation on building materials were fake materials such as prefabricated and fake materials such as imitation wood and bamboo. Camping, trekking, hiking, cycling, enjoying waterfalls and observing flora and fauna were the common ecotourism activities at Doi Suthep-Pui National Park. From the field survey, it was found that tourists enjoy the ecotourism activities but for staying came back to Chiang Mai city. When asked upon a question about the reasons of tourists not staying at the accommodation provided by national park, he replied it might be because of quality and services provided by them. He thought night trekking would be an additional ecotourism activity. He thought that using solar energy for electricity, electric vehicles and cable cars for transportation and using photovoltaic cells in building would be sustainable and green idea. He also thought that rain water harvesting and filtration was very important in accommodation. For that he suggested terrace water system for distribution and use of low water commode and fixture in bathrooms. He also suggested management of trash cans for solid waste and pipeline connection for liquid waste. To reduce pollution, he suggested to educate people and motivate them to use less pollutants. To reduce harmful chemicals, he suggested use green materials and improve natural heating and cooling method in building. To protect from fire and hazard proper zoning and right selection of materials were needed materials which are fireproof such as mud. In his opinion waste



and noise pollution from tourist were the main problems in Doi Suthep-Pui National Park. Finally, he suggested some of the strategies for each of the following components.

- i. Energy use: Use solar system
- ii. Transportation: Electric vehicles
- iii. Materials: Fake materials
- iv. Water: Rain water harvesting
- v. Land use and ecology: Controlled planning and zoning
- vi. Health: Primary health clinic
- vii. Pollution: Manage solid waste and control plastics
- viii. Sustainable technologies: Use green building materials
- ix. Accreditation: Promote marketing on ecotourism
- vi. Summary of interview with Dr. Chulathat Kitibutr

On 22<sup>nd</sup> September 2016, around 1 pm Dr. Chulathat Kitibutr 70 year of age (Managing Director of Chiang Mai Architects Collaborative Co. Ltd) was interviewed. He was one of the local architects in Chiang Mai and working in an architecture sector in Chiang Mai for a long time. When he was asked how many times he been to Doi Suthep-Pui National Park, he replied he had visited Doi Suthep-Pui National Park more than 50 times. Most of the time he travelled to Doi Suthep-Pui National Park by red bus of Chiang Mai. From the recent data from Department of National Park, Thailand, there were 285,915 visitors to Doi Suthep-Pui National Park. From field survey and questionnaires researcher found that the total capacity of 4 accommodations in Doi Suthep-Pui National Park was 700 per night. When asked upon a question that what should be the capacity of accommodation he replied the total capacity of accommodation was okay to be 700 per night. He thought it should not be more than 700 per night. In his opinion Khao Yai National Park and Doi Suthep-Pui National park were famous because of their unique attractions. He told that he was very interested in visiting Doi Suthep-Pui National Park for ecotourism purposes, staying at accommodation provided by national park, knowing the history, involving in conservation activities, developing sustainable tourism practices and improving existing tourism infrastructures. He also added he was very interested in designing architecture over those activities. From the site survey researcher found that architecture style of buildings in Doi Suthep-Pui National Park were mostly vernacular and contemporary (mixed Thai Lanna and with modern materials). They were small scale and mostly located

inside jungle. Building materials were commonly brick, concrete, timber, concrete tiles, and thatch. Construction techniques were modern more than vernacular except homestay. When asked upon a question that what was his opinion on accommodation styles merged with local architecture he replied it was not good and not suitable for the local environment. In his opinion he wanted to see more vernacular style houses with thatch roof and village architectural styles. He added there was no need of big scale development he think medium scale development around 30-40 rooms but in a separated way. He thought that it was better to renovate existing accommodation and creating new area for accommodation near hillside near Mae Rim area with the view of Chiang Mai city. He added for the conservation national park should be more careful on publicity and marketing. He suggested accommodation in Doi Suthep-Pui National Park should be designed in a vernacular Thai Lanna style. His recommendation on building materials wood and bamboo for construction, which should be locally available. Camping, trekking, hiking, cycling, enjoying waterfalls and observing flora and fauna were the common ecotourism activities at Doi Suthep-Pui National Park. When asked upon a question about the reasons of tourist not staying at the accommodation provided by national park, he replied it might because of nature of tourist. He thought night trekking, observing hill tribe and observing royal projects would be an additional ecotourism activities. He thought that using wind and solar energy for electricity, electric vehicles and cable cars for transportation and using photovoltaic cells in building would be sustainable and green idea. He also thought that rain water harvesting and filtration was very important in accommodation. For that he suggested terrace water system for distribution, small dam for collection and use of low water commode and fixture in bathrooms. He also suggested management of trash cans and no plastic for solid waste and pipeline connection for liquid waste. To reduce pollution, he suggested to educate people and motivate them to use less pollutants. To reduce harmful chemicals, he suggested use green materials and avoid harmful oil and improve natural heating and cooling method in building. To protect from fire and hazard proper zoning and right selection of materials were needed materials which are fireproof such as mud and fake materials. In his opinion wildlife disturbance and noise pollution from tourist were the main problems in Doi Suthep-Pui National Park. Finally, he suggested some of the strategies for each of the following components.

- i. Energy use: Use wind and solar system
- ii. Transportation: Electric vehicles
- iii. Materials: Local materials
- iv. Water: Recycle
- v. Land use and ecology: Controlled planning and zoning
- vi. Health: Primary health clinic
- vii. Pollution: Take waste outside national park
- viii. Sustainable technologies: Concrete technology
- ix. Accreditation: Promote marketing on ecotourism
- vii. Summary of interview with Dr. Pranom Tansukanun

On 23<sup>rd</sup> September 2016, around 5 pm Dr. Pranom Tansukanun (Associate Professor at Faculty of Architecture Chiang Mai University) was interviewed. She was teaching architecture in Chiang Mai University for a long time. When she was asked how many times she been to Doi Suthep-Pui National Park, he replied he had visited Doi Suthep-Pui National Park around 5 times. Most of the time she travelled to Doi Suthep-Pui National Park by personal four wheelers. From the recent data from Department of National Park, Thailand, there were 285,915 visitors to Doi Suthep-Pui National Park. From field survey and questionnaires researcher found that the total capacity of 4 accommodations in Doi Suthep-Pui National Park was 700 per night. When asked upon a question that what should be the capacity of accommodation she replied the total capacity of accommodation was okay to be 700 per night. She thought it should not be more than 700 per night. In her opinion Khao Yai National Park was the most famous national park in Thailand because it was located near Bangkok and most visited. She said that Doi Suthep-Pui National Park was famous because of cool climate and nature but also added Doi Suthep-Pui National Park was not convenient to reach. She told that she was somewhat interested in visiting Doi Suthep-Pui National Park for ecotourism purposes, staying at accommodation provided by national park, knowing the history, involving in conservation activities, developing sustainable tourism practices and improving existing tourism infrastructures. She also added she was very interested in designing architecture over those activities. From the site survey researcher found that architecture style of buildings in Doi Suthep-Pui National Park were mostly vernacular and contemporary (mixed Thai Lanna and with modern materials). They were small scale and mostly located

inside jungle. Building materials were commonly brick, concrete, timber, concrete tiles, and thatch. Construction techniques were modern more than vernacular except homestay. When asked upon a question that what was her opinion on accommodation styles merged with local architecture she replied it was not really. In her opinion she wanted to see more mixed green and traditional style. She added there was no need of big scale development and said we need to look at the carrying capacity. She thought that both renovating existing accommodation and creating new area for accommodation were good options but should be careful on the impacts to nature and local people, she said it should be studied first. She added for the conservation, national park should be more careful on carrying capacity. She suggested accommodation in Doi Suthep-Pui National Park should be designed in a simple and open manner and flow of space should be connected directly to nature. Her recommendation on building materials were woods, bamboos and pines from locally planted trees. Camping, trekking, hiking, cycling, enjoying waterfalls and observing flora and fauna were the common ecotourism activities at Doi Suthep-Pui National Park. From the field survey, it was found that tourist enjoy the ecotourism activities but for staying came back to Chiang Mai city. When asked upon a question about the reasons of tourist not staying at the accommodation provided by national park, she replied it might be difficult for tourist to follow sustainable tourism guidelines. She thought plants and bird watching tours would be an additional ecotourism activities. She thought that using solar energy for electricity, electric vehicles and cable cars for transportation and using photovoltaic cells in building would be sustainable and green idea. She also thought that rain water harvesting and filtration was very important in accommodation. For that she suggested terrace water system for distribution, dam (Fai) for collection and use of low water commode and fixture in bathrooms. She also suggested separation of organic and inorganic materials and for solid waste and pipeline connection for liquid waste. To reduce pollution, she suggested to educate people and motivate them to use less pollutants. To reduce harmful chemicals, she suggested use green materials and improve natural heating and cooling method in building by using appropriate architectural method. To protect from fire and hazard proper zoning and right selection of materials were needed materials which are fireproof such as mud. In her opinion waste, wildlife disturbance and noise pollution from tourist were the main problems in Doi

Suthep-Pui National Park. Finally, she suggested some of the strategies for each of the following components.

- i. Energy use: Use solar system
- ii. Transportation: Electric vehicles
- iii. Materials: Use original local materials
- iv. Water: Rain water harvesting
- v. Land use and ecology: Buffer zone
- vi. Health: Primary health clinic
- vii. Pollution: Separate solid wastes
- viii. Sustainable technologies: Use green building materials
- ix. Accreditation: Promote marketing on ecotourism

#### **4.4.3 Results of Interviewing Professor**

On 23<sup>rd</sup> September 2016, around 3 pm Dr. Nantawan Muangyai (Professor at Department of Tourism Faculty of Humanities Chiang Mai University) was interviewed. She was teaching tourism in Chiang Mai University for a long time. When she was asked how many times she been to Doi Suthep-Pui National Park, he replied he had visited Doi Suthep-Pui National Park around 5 times. Most of the time she travelled to Doi Suthep-Pui National Park by personal car and red bus of Chiang Mai. From the recent data from Department of National Park, Thailand, there were 285,915 visitors to Doi Suthep-Pui National Park. From field survey and questionnaires researcher found that the total capacity of 4 accommodations in Doi Suthep-Pui National Park was 700 per night. When asked upon a question that what should be the capacity of accommodation she replied the total capacity of accommodation was okay to be 700 per night. She thought it should not be more than 700 per night. In her opinion Doi Inthanon National Park was the most famous national park in Thailand includes the highest peak of Thailand. She said that Doi Suthep-Pui National Park was famous because of cool climate and Phrathat Doi Suthep Temple. She told that she was somewhat interested in visiting Doi Suthep-Pui National Park for ecotourism purposes, staying at accommodation provided by national park, knowing the history, involving in conservation activities, developing sustainable tourism practices and improving existing tourism infrastructures. She also added she was very interested in researching tourism over those activities. From the site survey researcher found that architecture style of buildings in Doi Suthep-Pui National Park were mostly

vernacular and contemporary (mixed Thai Lanna and with modern materials). They were small scale and mostly located inside jungle. Building materials were commonly brick, concrete, timber, concrete tiles, and thatch. Construction techniques were modern more than vernacular except homestay. When asked upon a question that what was her opinion on accommodation styles merged with local architecture she replied it was okay. She explained big scale development was not good for protected areas. She added for the conservation, national park should locate attraction place and control the number of tourist in attraction site. Her recommendation on building materials were woods and bamboos. Camping, trekking, hiking, cycling, enjoying waterfalls and observing flora and fauna were the common ecotourism activities at Doi Suthep-Pui National Park. From the field survey, it was found that tourist enjoy the ecotourism activities but for staying came back to Chiang Mai city. When asked upon a question about the reasons of tourist not staying at the accommodation provided by national park, she replied tourist coming to Thailand seeks more facilities rather than just visiting natural areas and national park has strict rules and guidelines. She thought historical site visiting and water activities would be an additional ecotourism activities.

#### **4.5 Design Criteria Development**

From the literature, the criteria for designing components of built environment within the framework of ecotourism for example eco-lodge, parks and hotel and those development and operations are the accommodation design criteria. (Ecotourism Ireland, 2015) has developed ecological best practice guidelines for construction and refurbishment of dwellings also known as accommodation. The criteria for design, construction, operation and maintenance will be based on following

- i. Design and Architecture
- ii. Local involvement
- iii. Energy use
- iv. Transportation
- v. Construction and Materials
- vi. Water
- vii. Land use and ecology
- viii. Health
- ix. Pollution

- x. Sustainable Technology
- xi. Accreditation

This part of finding explains how design criteria are generated from individual research methodologies. Data extracted from individual method such as reviewing existing plan and field survey, questionnaires and interviews. As stated in methodologies above, reviewing of existing plan and field survey gave architectural ideas of accommodation in Doi Suthep-Pui National Park, while questionnaires found ecotourism problems and interview found the solution of the problem. There were four places of accommodation and criteria is for all of them. Findings from each method are explained with the help of table below and they are compared with each criterion defined from literature review. The results are given below

#### 4.5.1 Design and Architecture

Table 4.2 Comparison of design and architecture

1. Literature Review	2. Site Review/Site Survey
<ul style="list-style-type: none"> <li>- For proper design, environmental and social and cultural impact assessments of site should be conducted.</li> <li>- Architecture and infrastructure should integrate harmoniously with surrounding area, for example by using natural materials and low structures to be minimally visible.</li> </ul>	<ul style="list-style-type: none"> <li>- Four places for accommodation found 3 (Doi Pui Campsite, National Park Accommodation and Monthathan Waterfall Campsite and accommodation) owned by national park and 1 (Khun Chang Khian Homestay) owned by local people.</li> <li>- Total capacity was 700 per night for all 4 sites. Services and facilities such as information, parking, lodging, camping and tents were provided during high season</li> <li>- Architecture style of building was contemporary except homestay. The style of homestay was vernacular with local materials</li> <li>- The buildings were outdated and had poor maintenance and lack of modern accommodation services</li> </ul>

Table 4.2 (Continued)

3. Questionnaires	4. Interviews
<ul style="list-style-type: none"> <li>- Accommodation styles were vernacular and contemporary, not ecologically designed.</li> <li>- Accommodation was located inside village and jungle.</li> <li>- Accommodation were small scale and merged with the nature</li> </ul>	<ul style="list-style-type: none"> <li>- Total capacity 700 per night in all four accommodation was the maximum capacity</li> <li>- Traditional and vernacular architecture should be designed for accommodation using local materials.</li> <li>- Small or medium scale development should be chosen with low rise building and flow of space directly connected to nature.</li> <li>- Thai Lanna style for roof should be adopted to reflect the identity of Chiang Mai city.</li> <li>- Hill areas should be chosen for new accommodation where beautiful views can be seen</li> </ul>



Figure 4.49 Architectural style of houses at DSPNP (Taken on 18-11-2015 by Pradip)



From the comparison, it can be resulted that the criteria for accommodation in Doi Suthep-Pui National Park on design and architecture, accommodation must be designed after analyzing environmental, social and cultural impact assessments of site and keeping in mind about carrying capacity. Buildings should focus on safety and comfort of tourist and surroundings must be functional. Functional spaces such as bedrooms, restrooms, restaurant should be easily accessible from each other. Buildings must be designed in traditional and vernacular architecture style regarding referencing from village using local materials. Big scale development is not suitable in national park so small scale development must be chosen. Accommodation should be located near hilly areas to capture views and roof should be in Thai Lanna style. Land should be carefully cleared without cutting important trees. Buildings must be low structures and minimally visible or surrounded by trees. Buildings should be low rise and flow of space directly connected to nature. Building must choose natural ways for ventilation rather than AC and fans. The old buildings must be renovated with the use of local materials. For the recreation and relaxation common areas such as green lawns, meeting area and view decks must be provided. Landscapes and gardens should be decorated with local plants and flowers.



Figure 4.50 Typical architectural styles of houses at DSPNP (DNP 2015)

#### 4.5.2 Local involvement and Conservation

Table 4.3 Comparison of local involvement and conservation

1. Literature Review	2. Site Review/Site Survey
<ul style="list-style-type: none"> <li>- Accommodation should provide sufficient information to tourist on cultural do's and don'ts</li> <li>- Accommodation should give work opportunities to nearby villagers and should support the community and school.</li> <li>- Accommodation should provide information to the tourist about nature and wildlife</li> </ul>	<ul style="list-style-type: none"> <li>- Involvement of the local was not seen</li> <li>- Local people participated only on the cultural dance shows organized by homestay</li> <li>- Information for cultural do's and don'ts were provided</li> <li>- Accommodation had not provided information about wildlife but provided information about nature</li> </ul>
3. Questionnaires	4. Interviews
<p>Tourist were very interested in learning nature, life of local people, culture and history</p> <ul style="list-style-type: none"> <li>- Tourist preferred to stay at homestay because of local and cultural interaction</li> <li>- Information provided by Doi Suthep-Pui National Park was not enough and quality of existing information counters was not good</li> </ul>	<ul style="list-style-type: none"> <li>- National park was planning to develop an Android App to give information about nature, culture and wildlife.</li> <li>- National park was to collaborate with local community to educate and develop homestay tourism inside village.</li> <li>- Souvenirs shops, local clothes and homestay tourism should be motivated to create job opportunities and involvement for local</li> </ul>

From the comparison, it can be resulted that the criteria for accommodation in Doi Suthep-Pui National Park on local involvement and conservation, accommodation must provide sufficient information to tourist on cultural do's and don'ts. Accommodation should explain traditional values of place and culture. They must provide job opportunities for local people as guide, receptionist or shopkeeper. Accommodation

should encourage villagers opening souvenirs shops, local clothes stores and restaurants. Only local people and local products should be encouraged. They must develop easy way to distribute information about nature, culture and wildlife of the national park. For example, website, brochures and mobile Apps. Accommodation must collaborate with local community to educate local people of ecotourism. They should encourage people to join cultural and educational activities.



Figure 4.51 Local clothes in K.C.K Village (Taken on 18-11-2015 by Pradip)



Figure 4.52 Local guide explaining tourist about local plant (DNP 2015)

#### 4.5.3 Energy use

Table 4.4 Comparison of energy use

1. Literature Review	2. Site Review/Site Survey
<ul style="list-style-type: none"> <li>- Should avoid air conditioning and other electric devices that use too much electricity.</li> <li>- Should use renewable energy sources such as solar, wind, small hydro and biogas for low energy consumption</li> </ul>	<ul style="list-style-type: none"> <li>- No air conditioning, heater and television was seen</li> <li>- Solar panels were seen but not in working condition</li> <li>- Wind energy, small hydro power and biogas were not seen</li> </ul>
3. Questionnaires	4. Interviews
<ul style="list-style-type: none"> <li>- Tourist thought that using solar panels was somewhat important for accommodation</li> <li>- Tourist also thought that using alternative energy other than electricity was somewhat important for accommodation</li> </ul>	<ul style="list-style-type: none"> <li>- Should use additional source of energy such as wind and solar</li> <li>- Should improve existing energy sources and should construct small hydro power</li> </ul>



Figure 4.53 Unused solar panels at Doi Pui Campsite (Taken on 18-11-2015 by Pradip)

From the comparison, it can be resulted that the criteria for accommodation in Doi Suthep-Pui National Park on energy use, accommodation must avoid air conditioning, refrigerator and other electric devices that use too much electricity. Accommodation must not be relied on electric supply only and must conserve existing energy sources. Power saving electric equipment should be chosen and be used efficiently. Accommodation must use renewable energy sources such as solar, wind, small hydro and biogas for energy. For heating and ventilation natural methods should be adopted rather than electric systems. Solar heating system should be used.

#### 4.5.4 Transportation

Table 4.5 Comparison of transportation

1. Literature Review	2. Site Review/Site Survey
<ul style="list-style-type: none"> <li>- Public transportation system and community transport should be encouraged</li> <li>- Vehicles such as electric cars, electric bikes and cable cars should be promoted and use of bicycle should be maximized</li> </ul>	<ul style="list-style-type: none"> <li>- Public transportation such as buses were not seen but only small red bus was seen.</li> <li>- Electric cars, buses and cable were not seen</li> <li>- Use of bicycle was seen</li> </ul>
3. Questionnaires	4. Interviews
<ul style="list-style-type: none"> <li>- Tourist used personal car for transportation in Doi Suthep-Pui National Park and they thought vehicle parking was very important space proved by accommodation</li> <li>- Majority of tourist thought that using sustainable transportation to reach Doi Suthep-Pui National Park was very important thing to consider by accommodation</li> </ul>	<ul style="list-style-type: none"> <li>- National park was planning to upgrade the road but no policy about cable cars.</li> <li>- Vehicles such as electric cars, electric bikes and electric buses for public transportation should be promoted</li> <li>- For cable cars, a detail analysis should be done for location, impact on environment and culture</li> <li>- Promote hiking and trekking rather than vehicles</li> </ul>

From the comparison, it can be resulted that the criteria for accommodation in Doi Suthep-Pui National Park on transportation, accommodation must use electric vehicles such as electric cars, electric bikes. Accommodation should educate tourists the negative impacts of fossil fuel and its shortage. Electric buses should be chosen for public transportation. Accommodation should encourage people to walk, travel and biking rather than bus and cars. Hiking and trekking should be promoted. Cable cars must not be constructed if it has major impacts on culture, environment and wildlife. Detail analysis must be done for location, impact on environment and culture. Mass transportation system should not be encouraged unless they have minimal impacts on environment of national park.



Figure 4.54 Medium of transportation in DSPNP (Taken on 18-11-2015 by Pradip)

#### 4.5.5 Construction and Materials

Table 4.6 Comparison of construction and materials

1. Literature Review	2. Site Review/Site Survey
<ul style="list-style-type: none"> <li>- Construction and materials should be labor intensive -local employment</li> <li>- Should be natural, renewable, sustainably harvested materials</li> <li>- Should be recycled materials such as glass and cement</li> </ul>	<ul style="list-style-type: none"> <li>- Local materials such as bamboo, wood, clay and thatch were used in homestay.</li> <li>- Another 3 accommodation did not used local materials. They used RCC structures, brick, wood and fiber cement tiles</li> </ul>

Table 4.6 (Continued)

3. Questionnaires	4. Interviews
<ul style="list-style-type: none"> <li>- Tourist thought using local materials was somewhat important</li> <li>- Tourist also thought using recycled materials was also somewhat important for accommodation</li> </ul>	<ul style="list-style-type: none"> <li>- Should engage local people in construction by community collaboration</li> <li>- Local materials should be used such as woods, bamboo, pines and thatch.</li> <li>- Use green and recycled materials or also fake materials</li> </ul>



Figure 4.55 Local Materials in homestay (Taken on 18-11-2015 by Pradip)

From the comparison, it can be resulted that the criteria for accommodation in Doi Suthep-Pui National Park on construction and materials, accommodation must use natural, renewable and sustainably harvested materials for construction and renovation. The materials must be locally available such as woods, bamboo, pines and thatch. Stone and glass can be used but only in foundation, floors and bathrooms. Bathrooms should be bigger in size and for roofing thatch or local ceramic tiles can should be used. Local people must be engaged in construction. In case of modern materials recycled and green materials should be chosen. Less painting should be done and more natural color and texture should be exposed.

#### 4.5.6 Water

Table 4.7 Comparison of water

1. Literature Review	2. Site Review/Site Survey
<ul style="list-style-type: none"> <li>- water saving (low-flow) faucets, showerheads &amp; toilets should be used</li> <li>- Rain water should be used stored and grey water should be reused: for gardens and toilets</li> <li>- Filtration techniques to remove chlorine, lime and organic chemicals and bacteria from incoming water should be used</li> </ul>	<ul style="list-style-type: none"> <li>- No water saving (low-flow) faucets, showerheads &amp; toilets were seen</li> <li>- No rain water harvesting was seen for storage and no grey water reuse: for gardens and toilets was seen</li> <li>- No sustainable filtration techniques were seen. Water was filtrated using electric equipment</li> </ul>
3. Questionnaires	4. Interviews
<ul style="list-style-type: none"> <li>- Majority of tourist felt that drinking water was very important service provided by accommodation</li> <li>- Tourist also thought using water filtration system and harvesting rain water was somewhat important.</li> </ul>	<ul style="list-style-type: none"> <li>-Terrace system should be adopted for water supply and collected using small dams like in a traditional style</li> <li>- Water saving (low-flow) faucets, showerheads &amp; toilets should be used</li> </ul>

From the comparison, it can be resulted that the criteria for accommodation in Doi Suthep-Pui National Park on water, accommodation must use terrace system for water supply and small traditional dams for collection. Dam must be of small capacity and cleaned regularly. Rain water must be stored and grey water should be reused: for gardens and toilets. Storage tanks on ground as well as roof should be provided to store water from national grid. Water saving (low-flow) faucets, showerheads & toilets should be used to save water. For the filtration, natural filtration methods should be adopted by using gravels and coal. Terrace water filtration should be done in the slope area for farming and other purposes.





Figure 4.56 Drinking water at Doi Pui Campsite (Taken on 18-11-2015 by Pradip)

#### 4.5.7 Land use and ecology

Table 4.8 Comparison of land use and ecology

1. Literature Review	2. Site Review/Site Survey
<ul style="list-style-type: none"> <li>- The refurbishment and renovation of existing buildings particularly old cottages and outbuildings should be encouraged</li> <li>- Indigenous species of trees should be preserved and planted and should conserve native hedges, flora and fauna to encourage wildlife</li> </ul>	<ul style="list-style-type: none"> <li>- Conservation of indigenous species of trees and plants were seen</li> <li>- Renovation of existing buildings and cottages were not seen.</li> <li>- Buildings used very few colors to merge itself inside nature and not to disturb wildlife</li> </ul>

Table 4.8 (Continued)

3. Questionnaires	4. Interviews
<ul style="list-style-type: none"> <li>- Tourist thought that renovating buildings was somewhat important for accommodation</li> <li>- Tourist also thought that saving important temples, trees and was somewhat important for accommodation</li> </ul>	<ul style="list-style-type: none"> <li>- Strict rules and policies were seen to protect nature, heritage and wildlife</li> <li>- National park was planning to make policies on renovating existing accommodation</li> <li>- Local people and tourist both should be educated about the flora fauna and native species.</li> </ul>



Figure 4.57 Conservation of tree at Doi-Pui Campsite (Taken on 18-11-2015 by Pradip)

From the comparison, it can be resulted that the criteria for accommodation in Doi Suthep-Pui National Park on land use and ecology, accommodation must refurbish and renovate existing buildings particularly old cottages and outbuildings. Accommodation must educate local people and tourist both about the flora, fauna and native species for conservation. The ecology of national park should not be disturbed. Small scale development should be adopted without cutting trees and disturbing wildlife.

#### 4.5.8 Health

Table 4.9 Comparison of health

1. Literature Review	2. Site Review/Site Survey
<ul style="list-style-type: none"> <li>- Limited disposables, biodegradable cleaning products and personal care products should be used to reduce the impact of chemical on surrounding natural environment</li> <li>- No pesticides, herbicides or synthetic fertilizers should be used and promote locally produced and natural products</li> </ul>	<ul style="list-style-type: none"> <li>- Use of harmful chemicals in buildings and materials were not seen</li> <li>- Local products were not used, no natural materials were seen</li> <li>- For health services, no any clinics were seen</li> </ul>
3. Questionnaires	4. Interviews
<ul style="list-style-type: none"> <li>- Tourist thought that primary health was somewhat important to be provided by accommodation</li> <li>- Majority of tourist thought that minimizing the use of harmful chemical in building material was very important for accommodation</li> </ul>	<ul style="list-style-type: none"> <li>- Primary health center should be constructed on the best service areas</li> <li>- Should use natural and sustainable method to treat materials to protect from harmful chemicals</li> <li>- Should encourage local to farm own organic farm</li> </ul>

From the comparison, it can be resulted that the criteria for accommodation in Doi Suthep-Pui National Park on health, accommodation must use limited disposables, biodegradable cleaning products and personal care products to reduce the impact of chemical on surrounding natural environment. Primary health center must be constructed on an appropriate service area of national park. Accommodation should encourage local to farm own organic farm and encourage tourist to use locally owned natural materials. Accommodation must not import food from outside and should buy from locals.



Figure 4.58 Farming in N.P. Accommodation (Taken on 18-11-2015 by Pradip)

#### 4.5.9 Pollution

Table 4.10 Comparison of pollution

1. Literature Review	2. Site Review/Site Survey
<ul style="list-style-type: none"> <li>- Solid waste should be separated in trash cans and should be reduced, reused, and recycled</li> <li>- Should do onsite wastewater treatment and should link sewage treatment and foul sewer to the town mains</li> </ul>	<ul style="list-style-type: none"> <li>- Trash cans were seen inside and nearby site to collect solid waste</li> <li>- No any methods of waste water treatment were seen</li> <li>- No use of Refrigerator and AC was seen</li> </ul>
3. Questionnaires	4. Interviews
<ul style="list-style-type: none"> <li>- Tourist thought that recycling solid waste and recycling liquid waste were somewhat important for the accommodation</li> </ul>	<ul style="list-style-type: none"> <li>- Trash cans should be provided in a convenient place and transported back to the city by municipality trucks</li> </ul>

Table 4.10 (Continued)

3. Questionnaires	4. Interviews
<p>Tourist also thought that using TV, refrigerator and other electronic equipment was not important</p>	<p>On site treatment of waste should not be done because to save the ecology of national park</p> <ul style="list-style-type: none"> <li>- Eco friendly vehicles should be used to reduce air pollution</li> <li>- Should incorporate sustainable methods such as wetlands or reed-beds for sewage treatment installation for liquid waste otherwise should be connected to the town mains</li> </ul>



Figure 4.59 Waste collection in N.P. Accommodation (Taken on 18-11-2015 by Pradip)

From the comparison, it can be resulted that the criteria for accommodation in Doi Suthep-Pui National Park on pollution, accommodation must separate solid waste in trash cans and it should be reduced, reused, and recycled. The pollutants should be separated from organic, inorganic and plastic. Use of plastic bottles and bag must be discouraged. On site treatment of solid waste must not be done to save the ecology of national park. Onsite wastewater treatment should be done using reed beds treatment and foul water

should be linked to the town mains. Vehicles running from fossil fuel should be discouraged and information regarding pollution must be provided.

#### 4.5.10 Sustainable technologies

Table 4.11 Comparison of sustainable technologies

1. Literature Review	2. Site Review/Site Survey
<ul style="list-style-type: none"> <li>- Should use sustainable heating and cooling methods such as solar, wind and photovoltaics</li> <li>- Should adopt green construction method with green materials and adopt natural design like natural ventilation</li> </ul>	<ul style="list-style-type: none"> <li>- No sustainable heating and cooling methods were seen.</li> <li>- Solar panels were seen but not working</li> </ul>
3. Questionnaires	4. Interviews
<ul style="list-style-type: none"> <li>- Majority of tourist thought that using refrigerator and AC was not important</li> </ul>	<ul style="list-style-type: none"> <li>- Should use sustainable heating and cooling methods such as solar, wind and photovoltaics</li> <li>- Should adopt green construction method with green and local materials</li> </ul>



Figure 4.60 Traditional techniques in M.W. Campsite (Taken on 18-11-2015 by Pradip)

From the comparison, it can be resulted that the criteria for accommodation in Doi Suthep-Pui National Park on sustainable technologies, accommodation must use sustainable heating and cooling methods such as solar, wind and photovoltaics. Must choose local and green materials. Accommodation should adopt green construction method with green and local materials. Local manpower and appropriate technologies should be chosen.

#### 4.5.11 Accreditation

Table 4.12 Comparison of accreditation

1. Literature Review	2. Site Review/Site Survey
- Should be provided with score and reviews from visitors which is online based.	- No any system of accreditation was seen - For booking online system was used
3. Questionnaires	4. Interviews
- Majority of tourist thought that using ecological design certification and accreditation	- National park was planning to develop Mobile Apps to give information about nature, culture and wildlife -Ecotourism should be promoted

From the comparison, it can be resulted that the criteria for accommodation in Doi Suthep-Pui National Park on accreditation, accommodation must design platform and surveys to book and rate accommodation with scores. Accommodation must develop easy way to distribute information about nature, culture and wildlife. For example, websites, brochure and mobile apps. Accommodation should be registered to network of ecotourism such as The International Ecotourism Society.



Figure 4.61 The International Ecotourism Society for ecotourism accreditation (TIES)