

# TERMINAL REPORT

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## Carrying Capacity Assessment of Mount Pulag National Park for Ecotourism and Sustainable Development



Republic of the Philippines  
Department of Environment and Natural Resources  
Ecosystems Research and Development Service  
Loakan Road, Baguio City  
Cordillera Administrative Region

# **TERMINAL REPORT**

**TITLE : CARRYING CAPACITY ASSESSMENT OF MOUNT PULAG NATIONAL PARK FOR ECOTOURISM AND SUSTAINABLE DEVELOPMENT**

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## ABSTRACT

*The Carrying Capacity Assessment of Mount Pulag National Park for Ecotourism and Sustainable Development was conducted for one year from October 2007 to October 2008. Five (5) attraction sites were assessed namely: the briefing area of the Protected Area Office; the Ranger Station and CENRO Building as lodging house; Camps II and III; and summit.*

*The data needed were collected through the triangulation method. This involved collection of secondary data, data observation and interview through the prepared structured interview schedules. Three (3) sets of respondents were interviewed namely: Community members (35 respondents), visitors (49 respondents) and Protected Area Managers (14 respondents).*

*The information/data generated were coded and inputted using STATISTICA 4 and SPSS software. Using the Boullons CARCAP equation, computation of the tourism carrying capacity was undertaken at three (3) levels: the Carrying Capacity (CC), Potential Carrying Capacity (PCC) and Real Carrying Capacity (RCC).*

*The briefing area in the Protected Area Office has a CC of 70 visitors, PCC of 560 visitors with an RCC of 558 visitors per day and with computed CC, PCC and RCC per annum of 16,940, 135,520 and 135,036 visitors, respectively. The standard area occupied by a visitor in the briefing area is 1m<sup>2</sup> with one limiting factor which is the rainfall for four (4) months. In the Ranger Station and CENRO building at barangay Babadak, Kabayan, Benguet, with standard area occupied by a visitor of 2 m<sup>2</sup> and considering that the rotation coefficient in lodging is one (1), the computed CC and PCC have the same value of 42 visitors, and with 41.85 or 42 visitors per day for RCC. The annual CC, PCC and RCC have the same number of visitors of 10,164.*

*With standard area occupied by visitors in camping of 3.75 m<sup>2</sup>, the computed CC in Camps II and III are 443 and 642 visitors, respectively. The computed PCC of Camps II and III are the same with their computed carrying capacities considering that in camping the rotation coefficient is equivalent to one (1). Camp III has a bigger area (2406 m<sup>2</sup>) than camp II (1,658 m<sup>2</sup>) thus greater number of visitors can be accommodated. There were three (3) limiting factors identified in both camps that affect the visit or stay of the visitors in these areas. These include the limited number of comfort rooms or pits, and waiting sheds, and the four (4) rainy months where only few visit the park. Based from these limiting factors, the computed RCC of camps II and III are 437 and 638 visitors which are lower than the computed CC and PCC. The annual PCC and RCC of the camps are 107,206 and 155,354 visitors; and 10,164 and 154,396 visitors, respectively.*

*The summit having an effective viewing area of 85 m<sup>2</sup> and with the standard area for a visitor to occupy 1.11 m<sup>2</sup>, the CC, PCC and RCC is 77 visitors/day. Annually, the computed number of visitors that can be accommodated by the summit to view the sunrise is 18,634 visitors. The summit has an elevation of 2,922 masl which is the number 1 attraction site in the park preferred by the visitor respondents to visit. Since camps II and III have higher number of visitors to accommodate than the summit, alternative site should be offered like the relay station area where to view sunrise. The by-batch scheme should also be practiced when greater than 77 visitors will visit the summit.*

*There were common problems identified by the different respondents related to the*

*management of the park. These include the poor condition of the Protected Area Office to Babadak road, limited parking space in PA Office, poor condition of the Ranger Station and CENRO building in Babadak, expansion of vegetable gardens that creates an eye sore to visitors, insufficient number of park rangers to safeguard the park from any form of destruction, and lack or limited number and poor condition of waiting sheds and Comfort rooms/pits in camps I, II and III. These problems affect the comfort and satisfaction of every stakeholder visiting the park.*

## **I. INTRODUCTION**

Protected areas are areas designated/declared for biodiversity conservation in situ. Wild plants and animals are protected under natural conditions where they can evolve and develop to enhance genetic diversity. Protected areas may consist of more than one ecosystems like the terrestrial or aquatic habitats. Resources within protected areas are in their natural state and numerous either consumptive or non consumptive and are very attractive to anthropogenic activities. The non consumptive benefits offered by the protected areas are dependent on the aesthetic attributes afforded by biodiversity richness, natural physical formations and sheer beauty of the sceneries. These qualities of the natural, physical and biological features of the protected area invite visitors, climbers/trekkers that if not managed and maintained cause alteration/changes on the ecotourism quality of the park.

With the multiple uses of the resources and the intangible benefits therein for enjoyment, the extent and intensity of visitors' entry and other activities should be within the limit or carrying capacity of the protected areas. Products/materials collection and outdoor recreation and ecotourism need to be regulated or controlled in order to minimize the negative impacts on resources base within the protected areas. Otherwise, when left uncontrolled the capacity of the park to provide benefits and services will be adversely affected. Should this happen, it will pose a threat to the integrity of the ecosystem.

Mt. Pulag National Park is one of the Protected Areas in the country inhabited with high degree of plant diversity and a favorite ecological destination of nature lovers and trekkers. A prominent ecological destination endowed with unique biodiversity. One of the essential prescriptions in the General Management Plan (GMP) of the Mt. Pulag is to highlight the biological and cultural significance of the park to institute tourism and visitors management that encompasses not only the regulation of visitors' entry but also the trekking and camping activities. The need to determine the carrying capacity of each tourist area within the park is timely to provide basis for the park managers in setting up policies and regulations in the utilization of the park without sacrificing the satisfaction of the visitors.

In the light of the foregoing scenario, the study was conducted in order to formulate

methodologies and model in the carrying capacity for Mt. pulag National Park as a key planning tool for sustainable ecotourism development.

## **II. REVIEW OF LITERATURE**

The Mount Pulag National Park is the second highest Mountain in the Philippines. The park was proclaimed in February 20, 1987 by virtue of Presidential Proclamation No. 75. It was also partly or wholly covered by other proclamations – Proclamation No. 217 in 1920 and proclamation 548 in 1969. In April 2000, Proclamation No. 268 established the Upper Agno River Basin Resource Reserve which covers the environs of Mt. Pulag National Park. As an initial component of the NIPAS Act the area is currently being established as a protected area under the NIPAS framework (Mt. Pulag National Park General Management Plan, 2000).

Carrying capacity had been defined in various ways, depending on the resources in question, like land, clean air, water, biodiversity as related to the consumers or populations specific activities towards exploiting or using the available resources. Carrying capacity is typically expressed as the number of animals of a certain type which can be supported in a defined habitat without permanently impairing the productivity of that habitat or ecosystem (Catton, 1986). Carrying capacity is also viewed as the maximum rates of resource harvesting and waste generation (the maximum load) that can be sustained indefinitely without progressively impairing the productivity and functional integrity of relevant ecosystems wherever the latter may be located. The size of the corresponding population would be a function of technological sophistication and mean per capita material standards (Rees 1995). This definition implies that regardless of the state of technology, humankind depends on a variety of ecological goods and services provided by nature and that for sustainability, these must be available in increasing quantities from somewhere on the planet as population and mean per capita resource consumption increase.

In the context of tourism, carrying capacity is the maximum number of individuals that can be accommodated in an area without affecting the state of the environment, the level of satisfaction of the visitor, and the socio-cultural norms of the host community. Carrying capacity is usually differentiated into environmental and social levels. Environmental carrying capacity usually involves the impacts brought by tourism in an area like waste generation, water consumption, and physical effects like erosion through hiking. Social carrying capacity is usually measured by the

number of people who can fully enjoy a destination or activity. Another factor in the social carrying capacity is the sensitivity to the cultural impacts that may be brought by the number of tourists to a destination. Having considered both environmental and social factors, then the management of ecotourism destinations based on the carrying capacity will be more easily practiced (Libosada, Carlos, 2006).

According to Rees (1990) even with rapid technological advances, humankind are “obligately dependent” on productivity and life support systems of ecosystems. This condition is attributed to the fixed nature of productive land and natural capital, i.e. resources from ecosystems, aggravated by intensive exploitation and utilization that resource bases could decline. As a consequence, analyses of carrying capacity of land and natural resources became imperative for sustainable development planning.

As economies grow continuously, and consumption of resources (food and energy) exceeds natural capital (such as biodiversity, air, land, water, timber, etc.) negative impacts are manifested in decline of biodiversity, pollution of land, air, water, climatic changes, soil erosion and floods, etc. With environmental factors taken into account in evaluating production and utilization of resources, carrying capacity would mean the maximum rates of resource harvesting and waste generation that can be sustained without progressively impairing productivity and functional integrity of ecosystems whenever these are located. (Rees, 1988).

### **III. OBJECTIVES**

General: To assess the carrying capacity of Mt. Pulag National Park for ecotourism and sustainable development.

Specific Objectives:

1. To determine critical parameters in the environment and socio-economic variables that limits carrying capacity potential of protected area.
2. To assess existing facilities/attraction sites and the limiting factors that may affect the carrying capacity of these sites
3. To assess visitors preferences including their aesthetic appreciation of the

- recreational facilities in the protected area.
4. To test these parameters and variables as inputs to model development.
  5. To incorporate results of the study for policy formulation.

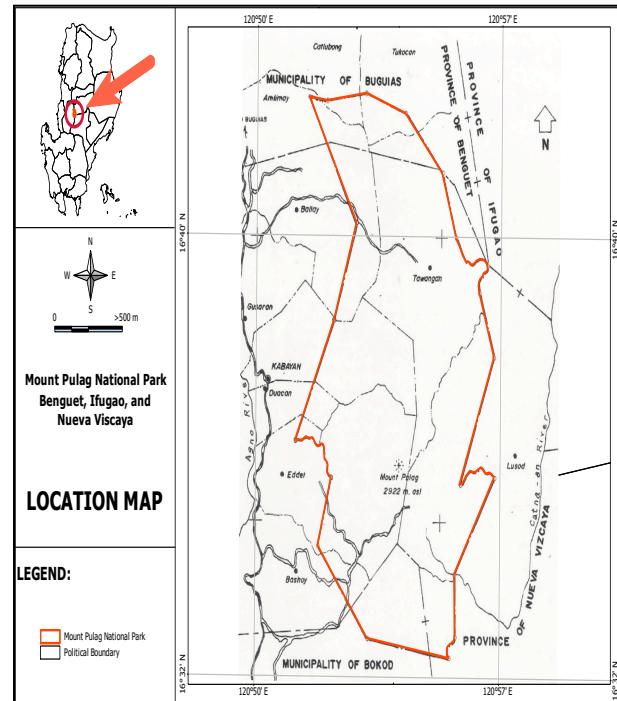
## IV. METHODOLOGY

### Study Area

The study was implemented within the Mount Pulag National Park. The park covers an approximate area of 11,550 hectares of public domain that lies on the north and south spine of the Grand Cordillera Central Mountain Ranges. It straddles portions of the provinces of Benguet, Ifugao, and Nueva Vizcaya. The specific areas include portions of the municipalities of Kabayan, Bokod and Buguias in Benguet and the municipality of Tinoc in Ifugao and the municipality of Kayapa in Nueva Viscaya.

Initially, all the attraction sites found within the park were targeted for the carrying capacity analyses. These includes camping areas such as Camps I, II, III, Marlboro country, cow country, camping area at Eddet River, Protected Area Office (PAO), Babadak Ranger Station, Summit, Relay Station, Mt. Tabayok, Ambulalakaw Lake and the different trails/routes used by the visitors to reach the Mt. Pulag Summit.

However, after initial interviews and initial data analyses, the targeted areas for CARCAP analyses was refocused considering that only few visitors and other respondents were able to visit the other attraction sites/facilities of the park. Likewise, there was a difficulty in conducting interview to visitors considering that they are very hard to contact within reach because they are always rushing and tired after their hike. The short duration of the study implementation



and the limited financial support also limit the coverage of the CARCAP analyses.

After thorough discussion with the ERDB counterparts, the implementers finally decided to concentrate its CARCAP assessment on some of the facilities such as Protected Area Office (PAO) at Ambangeg, Bokod, Benguet, Babadak Ranger Station, waiting shed camp I, camping sites II, III and summit which are the areas visited mostly by the respondents.

### **Preparation of Interview Schedule**

Three (3) sets of interview schedules were prepared for the three (3) sets of respondents namely: visitors, community, and the Protected Area Managers like key informants from the Protected Area Management Board (PAMB) members and other Department of Environment and Natural Resources (DENR) personnel involved in the management and supervision of the protected area. The interview schedule contained the following: socio-demographic profile of respondents; general information about the protected area particularly on the different attraction sites/facilities; knowledge and awareness of the protected area, cultural practices, preferences and perception about the park and gender and development issues pertaining to ecotourism development in the protected area. The responses to these concerns including the information on biophysical attributes were used in extracting limiting factors in the management and use of the park which were also used in model development. A working definition of carrying capacity for a protected area resources use was conceptualized as: the maximum number of people that a site can accommodate without necessarily impairing the environment and social qualities of which the protected area management seeks to preserve.

## **Data Gathering Technique**

Information needed were collected through the triangulation method. This involved collection of secondary data, interview through the prepared interview schedules and data observation.

### **a. Survey**

Personal interviews were conducted to the community living within and adjacent to the Protected

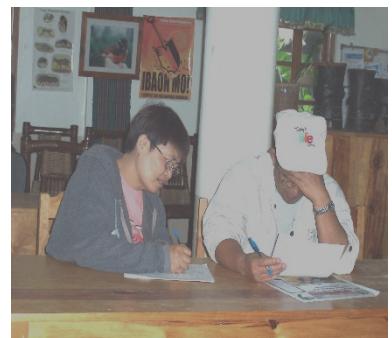


Area. Community members sampled were from barangays Ambangeg, Karao, Bila of the municipality of Bokod; barangays Babadak, Poblacion, Eddet/Teltelpok, Bashoy, Tawangan of Kabayan municipality, and barangay Amlimay of Buguias, Benguet.



For the visitors, interviews were done onsite and in their respective offices and homes. Visitors are hard to get in touch with especially after coming from the long trek because they are tired and in a hurry to go home. Their addresses were obtained from the visitors logbooks in the PA office.

The Protected Area Managers interviewed include personnel from the Regional Office of the DENR-CAR mostly from the Protected Area and Wildlife and Coastal Zone Management Service (PAWCZMS), CENRO Baguio personnel that include forest guards who were assigned to man the Mt. Pulag National Park, and a member of the Protected Area Management Board (PAMB). The park is administered by the Interim Protected Area Management Board representing 33 local stakeholders.



### **b. Secondary data gathering**

Secondary data gathered includes visitors profile for both local and foreign tourists, maps, address of the different visitors who were interviewed in their offices/residence, and other related information. Rainfall data was gathered in the PAGASA, Baguio City.

### **c. Observation and actual measurement**

Actual survey/measurement of the facilities subjected for CARCAP analyses was undertaken with the assistance of the Park Rangers. The area of facilities measured includes the Protected Area office in Ambangeg, Bokod, Benguet; Babadak ranger station and CENRO building, waiting sheds in camps I and II, camping areas (I, II and III) and summit. Observations were also noted on the condition of the different facilities which are needed in the analyses of the data gathered and in the preparation of the report.



## **Data Analyses and Interpretation**

The data and information generated (primary and secondary) were coded and inputted using STATISTICA 4 and SPSS softwares.

Descriptive statistics like frequency counts and percentages were used in describing the profile of the respondents and their tourism preferences and standard requirements.

Bouillon's CARCAP equation was used in the computation of the tourism carrying capacity.

CARCAP computation was done at three levels.

### 1. Carrying Capacity (CC)

This is the first level of **Carrying Capacity (CC)** computation, using the following formula:

$$CC = \frac{\text{Total size of an area (sq m)}}{\text{Standard size requirement of tourists/visitors}}$$

Calculation was done by dividing the total size of a particular area with the average or standard size requirement of tourists/visitors.

### 2. Potential Carrying Capacity (PCC)

The second level, known as **Potential Carrying Capacity (PCC)**, was calculated by computing first the rotation coefficient (RC) of specific tourism activity. The formula used is:

$$RC = \frac{\text{Total number of hours a specific area is open for use}}{\text{Average number of hours an area is used by tourists/visitors}}$$

Then, **PCC** was derived by multiplying the **CC** with the rotation coefficient (**PCC** = **CC x RC**).

### 3. Real Carrying Capacity (RCC)

For the third level of CARCAP, the **Real Carrying Capacity (RCC)** was computed by incorporating the limiting factors identified during the interviews and observations in the sites. The formula used is as follows:

$$RCC = PCC \times \frac{100 - Lf_1}{100} \times \frac{100 - Lf_2}{100} \times \frac{100 - Lf_3}{100} \times \frac{100 - Lf_n}{100}$$

where:

$$Lf_{(1,2,3 \dots n)} \text{ (Limiting Factors)} = \frac{M_{(a,b,c,\dots n)}}{M_T} \times 100$$

$M_{(a,b,c,\dots n)}$  = limiting magnitude of the factor/variable  
 $M_T$  = total magnitude of the factor/variable

## **V. RESULTS AND DISCUSSIONS**

### **A. BIOPHYSICAL CHARACTERISTICS AND ATTRIBUTES OF THE SITE**

#### **Location and Boundaries**

Mount Pulag National Park lies on the north and south pine of the Cordillera Central that stretches from Pasaleng, Ilocos Norte to the Cordillera Provinces. The park is situated at  $16^{\circ} 30' 36''$  north longitude and  $120^{\circ} 50' 20''$ . It falls within the administrative jurisdiction of two Regions, Cordillera Administrative Region (CAR) and Cagayan Valley (Region 2) and covers two provinces in CAR such as Benguet and Ifugao and only Nueva Vizcaya in Region 2. It lies in 5 municipalities: Bokod, Buguias and Kabayan in Benguet, Tinoc in Ifugao and Kayapa of Nueva Viscaya.

The Park is located 85 km northeast of Baguio City. It can be reached via national highway leading to the western portion of the park, Kabayan Poblacion. An unscaled side road, running from Ambangeg to Babadak, branches from the national highway and is the main access to the park in the south that was established by the Benguet Consolidated Inc. as logging road in the 1960s. Nine kilometers north of Kabayan Poblacion, another side road leads to barangay Ballay going to barangay Tawangan proper, bisecting the northern portion of the park. A web of foot trails criss-cross the park. Trails start either at the foothills or the middle of the mountains where the road system ends.

#### **Topography**

The whole park is located within the Philippine Cordillera Mountain Range. Topography is very rugged, characterized by steep to very steep slopes at the mountainsides and generally rolling areas at the mountain peaks. The park embraces three closely clustered, rugged and steep mountains that have watercourses running through sharp slopes. The whole park almost has a slope of greater than 50%. These three mountains are Mt. Pulag (2,922 m), Mt. Tabayoc (2,819 m), and Mt. Panatoan (2,650 m). There are four other peaks in the park that rises to more than 2,200 m. Caves can likewise be found in several places. Mt. Pulag is the most prominent feature on the National Park. It is the highest peak in Luzon and is the second highest mountain in the Philippines.

## Climate

The general climate of Benguet falls under two types II and III. The northeastern part, where Mt. Pulag is located, is under type III – no pronounced maximum rain period, dry from November to April and wet during the rest of the year. General observation showed that the area is characterized by heavy rainfall occurrence usually starting in May until October and dry from November to April (Table 1).

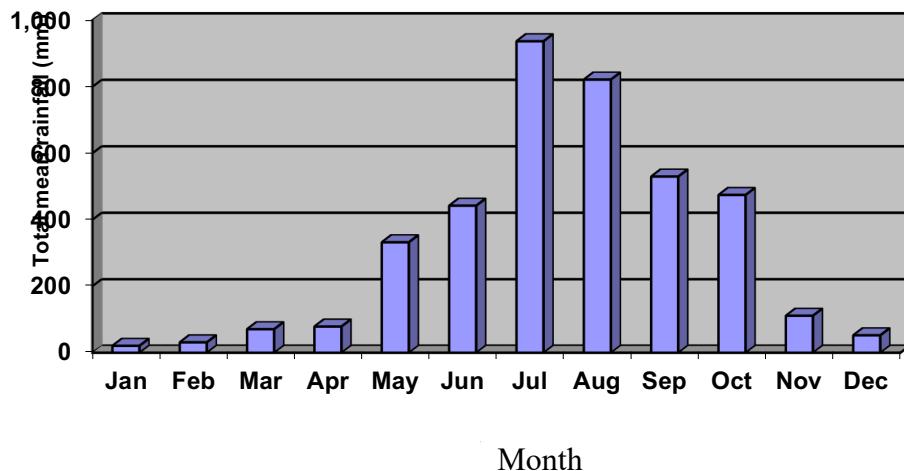
Table 1. Total monthly and annual rainfall from 1998-2007 (mm)

<b>MO.</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>TOTAL</b>	<b>MEAN</b>
Jan	0.0	5.7	3.6	14.6	5.0	0.0	17.0	0.2	160.6	T	206.1	20.67
Feb	0.0	0.1	106.9	39.5	2.0	25.4	128.6	0.0	8.8	0.6	311.9	31.19
Mar	14.4	121.1	151.7	289.8	0.6	4.8	0.0	54.6	38.4	31.8	707.2	70.72
Apr	44.1	245.5	178.7	76.0	71.2	46.8	37.8	32.0	29.6	25.4	787.1	78.71
May	307.1	293.8	470.6	291.0	264.4	662.7	428.6	29.1	266.5	308.6	3322.4	332.24
Jun	82.7	541.3	249.4	451.4	411.0	792.4	1306.5	42.7	188.2	358.4	4424	442.4
Jul	290.8	724.3	1385.7	1642.0	1883.4	721.3	445.4	292.4	1769.8	216	9371.1	937.11
Aug	291.9	1279.3	697.3	274.0	525.6	1089.4	1432.9	690.2	735.8	1201.6	8218	821.8
Sept	1031.8	694.5	640.6	842.2	301.5	303.2	225.6	644.6	207.6	408.4	5300	530
Oct	1569.3	732.5	917.6	97.0	224.8	179.7	42.4	256.6	316.0	410.3	4746.2	474.62
Nov	85.2	99.5	51.4	61.6	67.3	60.4	114.5	55.2	72.4	444.8	1112.3	111.23
Dec	89.5	44.5	63.6	23.2	10.0	4.4	154.9	68.0	43.2	21.6	522.9	52.29
<b>TOT</b>	<b>3806.8</b>	<b>4782.1</b>	<b>4917.1</b>	<b>4102.3</b>	<b>3766.8</b>	<b>3890.5</b>	<b>4334.2</b>	<b>2165.6</b>	<b>3836.9</b>	<b>3427.5</b>	<b>39029.8</b>	<b>3902.98</b>

Source: PAGASA, Baguio City

The total amount of rainfall for 10 years (1998-2007) registered to 39,029.8 mm with an average of 3,902.98 mm/year. The month of July has the highest mean monthly rainfall of 937.11 mm followed by August 821.8 mm, September 530 mm, October 474.62 mm and June 442.4 mm.

Fig. 1. Graph showing the Mean Total Monthly Rainfall (mm) from 1998-2008



## Hydrology

Several tributaries originating from Mt. Pulag feed its water into two major river systems:



the Agno in the west and the Catnaan in the east. Other tributaries in the southern part of the park join other streams and rivers flowing to Bambang River in Nueva Viscaya. The Agno River originates from the municipality of Buguias, and then flows toward the south to feed the Ambuklao Hydroelectric Plant in Bokod and the Binga Hydroelectric Power plant in Itogon.

It exits at the southern part of Benguet and joins the sea at the Lingayen Gulf in Pangasinan. The Catnaan River serves as the depository of all major headwaters from the northeast part of the park including Tinoc in Ifugao, Tawangan and Lusod, both in Kabayan and from the southeast barangays covering portions of Balete in Kayapa. The river flows east to join the Ifugao River and feeds its waters into Magat Hydroelectric Power plant in Isabela.

As a watershed, Mt. Pulag supplies the water needs of many communities and stakeholders for domestic and industrial use, irrigation, hydroelectric power production in Luzon such as Binga, Ambuklao, San Roque and Magat, and aquaculture.

## Land Cover

Mount Pulag is one of the eighteen sites identified as ecosystem and habitat containing high plant diversity in the country (NBSAP, 1997 as cited in the General Management Plan of the park). It is popularly noted for its unique vegetation profile that remains unmatched in the whole archipelago. The park, has three prominent vegetation zones: the pine forest, the mossy forest and the grassland summit. The Benguet pine (*Pinus kesiya* Royle ex Gordon) forest, a very prominent species not only in the Park but also entire Cordilleras occupies the lower slopes of the mountain up to about 2,300 m, with an area of 2,047 hectares or percentage cover of 18%. Higher up the elevation is the mossy forest (5,822 hectares), which is



dominated by species of four (4) from the families of Fagaceae, Podocarpaceae, Lauraceae, and Euphorbiaceae.



The mossy forests constitute the greater extent of vegetation in the area covering almost half of the entire protected area. Ferns, lichens and moss grow thick on the trunks of trees because of high moisture. Right above the mossy forest is the dwarf bamboo-covered grassland summit, which has gently rolling landscape with hills and slopes. The grassland

that entirely covers the summit has an area of around 800 hectares or 7% of the total land area while the cultivated/residential area covers 25 % or 2,877 hectares (Table 2).

Table 2. Land cover and corresponding area within the park

LAND COVER	AREA	
	HECTARES	PERCENT (%)
Mossy Forest	5,822	50.41
Cultivated area/residential	2,877	24.99
Pine Forest	2,047	17.72
Openland/grassland	804	6.96
TOTAL	11,550	100.00

Source: Integrated Protected Area Plan (IPAP), DENR, 1994

## **B. ECOTOURISM FACILITIES/ACTIVITIES IN THE AREA**

### **B.1. Description of Ecotourism Activity**

Mt. Pulag National Park is one of the identified banner ecotourism sites in the Cordilleras that offers different ecotourism activities. Trekking is one of the major tourism activities in the park. Trekking could be done following different trails/routes. These are Babadak Ranger Station to summit trail which is known as the “easy trail”; Akiki trail or popularly known as “killer trail”; Tinoc to summit trail (via Tawangan and Lusod), and Bayombong, Nueva Vizcaya to summit trail. The Babadak Ranger Station to summit trail is the most used trail by the visitors especially the beginners, followed by the Akiki trail to reach the summit. The other routes are seldom used by the visitors.



Camping is another major tourism activity done in designated camping areas within the park. Camp II which is found in the mossy forest and grassland ecotone is the designated camping area for tourist using the Babadak Ranger Station to summit route. Camp I which has a waiting shed found along the stretch of the easy trail is used only as resting area when traversing the “easy trail”. Camping is also allowed in the Ranger Station area only when the buildings in the station cannot accommodate the visitors for lodging but seldom happen. On the other hand, camping can also be done in Marlboro country, cow country, camp site in Eddet River and Camp III for visitors following the Akiki trail. Camp III is the nearest camp to the summit.

Sunrise viewing is the ultimate goal of every visitor visiting the park. The summit is the best place to have a view of the sunrise and the sunset. This is the reason why the ecotourism package being promoted by the management is tailored to meet this objective. Sunrise can be viewed from about 4:45 AM to 6 AM.

Other ecotourism attraction offered by the park includes the Ambulalakaw Lake. This lake was recently judged as the cleanest inland body in the region within the mossy forest.

## B.2. Features of the tourist facilities

### B.2.1 Protected Area Office (PAO) to Babadak Ranger Station to summit Trail

Mt. Pulag National Park is traveled for three (3) hours from the City of Baguio through Public Utility Vehicles (PUVs) plying the Baguio – Kabayan Road. The Babadak Ranger Station to summit trail is the easiest trail suited for the beginners. This is the trail used by most of the respondents, thus the subject of the study.

The first ecotourism facility is the Protected Area Office (PAO) in Ambangeg, Bokod, Benguet. It is where registration and briefing are undertaken before the visitors' ascend. The briefing is usually done by the Park Superintendent (PASu) or other PA staffs. The briefing includes information/background about the park, park rules and regulations giving emphasis on the rules of ascent, camping rules, cultural codes of conduct on the sacred ground (grassland and mossy forest), waste management, park fees, and other related information about the park. The facility has briefing area, display rooms for souvenirs, 4 lodging rooms, 6 comfort rooms/bath rooms, two (2) waiting sheds and a parking space. The total floor area of the PA building is 257 sq. meters.



The ascent starts from the PA office. To reach the Babadak Ranger Station which is about 10 kilometers or about 5 hours hike from the PA office, the visitor should start walking 1 pm to at least reach the station before dusk. The travel time can be lessened using vehicle for about 2.5 hours.

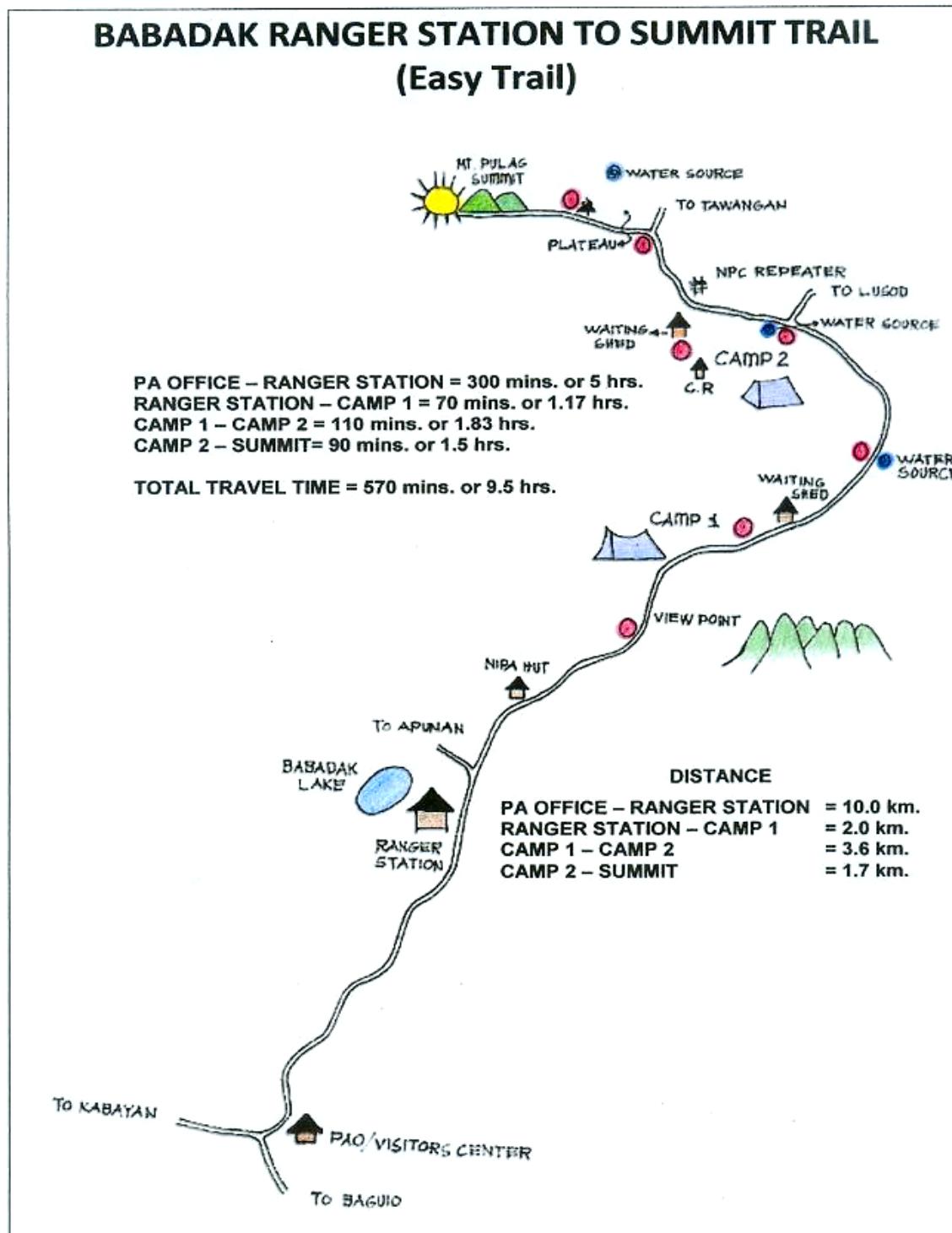
There are two (2) buildings in the station, the ranger station and the Community and Environment and Natural Resources (CENR) building. These buildings accommodate

the visitors who rest from 7 pm to 2 o'clock in the following morning. At 2:00 o'clock in the morning, visitors start to walk to the summit. The two (2) buildings have 7 lodging rooms and can accommodate an average of 8 persons per room, 3 comfort rooms, a kitchen for building each and a fire place (CENR building). A total of 351 m<sup>2</sup> is occupied by both ranger station and the CENR building.

Two (2) kilometers away from the ranger station is camp I with an area of 105 m<sup>2</sup>. Within Camp I is a waiting shed where visitors usually rest for about 15-20 minutes during the trek. The camp is traveled from the ranger station for 1.17 hours. In the camp, part of the summit can be viewed.

Camp II has an area of 1,659 m<sup>2</sup> and is 3.6 kilometers or 110 minutes walk away from camp I. The camp has a separate pit for men and women, a waiting shed which is sometimes used for lodging by Park Rangers during their patrol works, and with a water source 100 meters away from the camp.

Fig. 2. Sketch map of Babadak Ranger Station to Summit Trail



The summit which is the second highest point in the Philippines has an elevation of 2,922 meters above sea level. It is the highest point in the park that all visitors want to reach. It is where the beautiful sunrise and sunset can be viewed. The summit is 1.7 kilometers away from camp II and is traveled for about 1.5 hours. The summit has an area of 95 m<sup>2</sup> with 10m<sup>2</sup> covered with dense 1 meter tall dwarf bamboos.



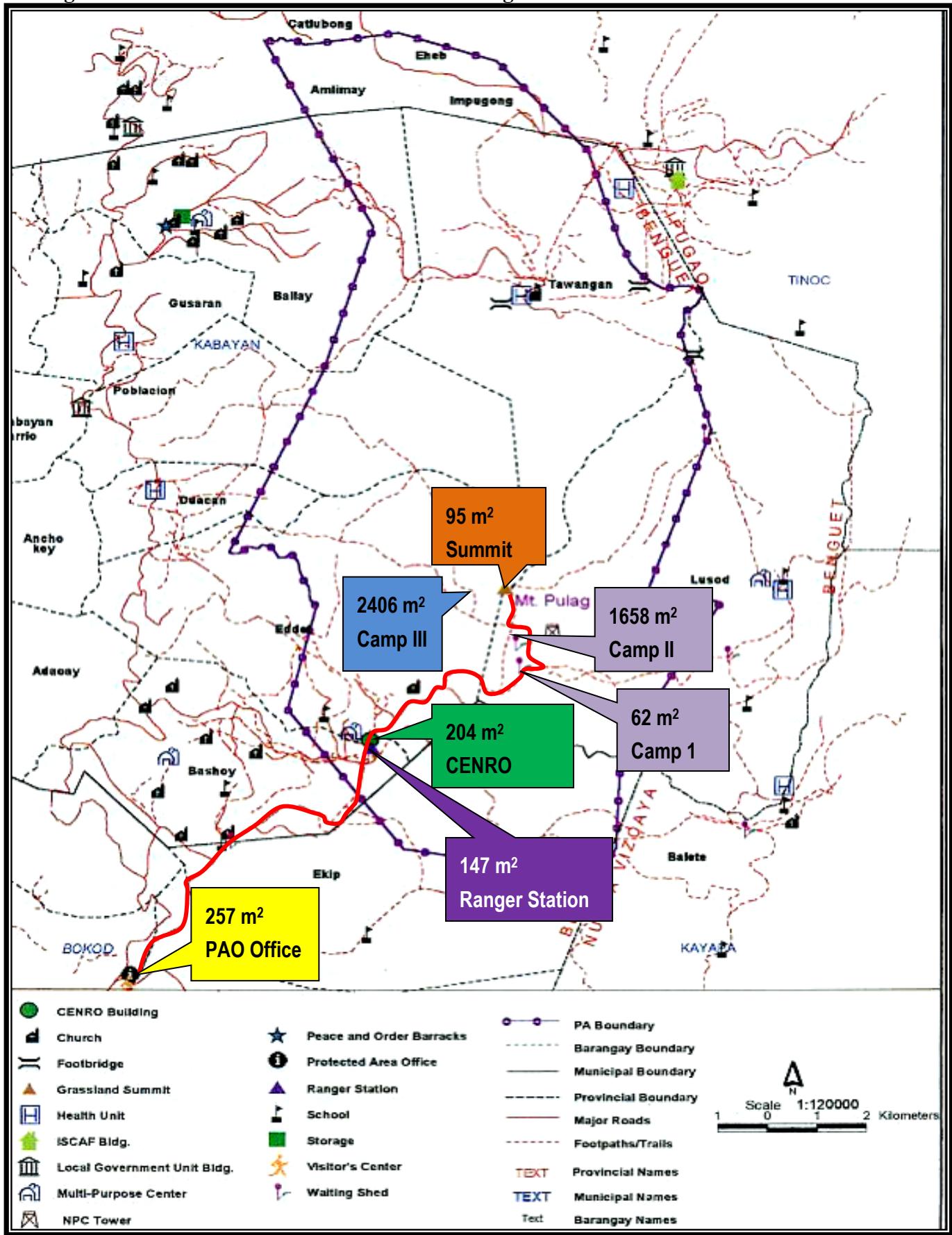
The visitors usually use the trail in going back to PA office to sign out. The total length of the PAO - Babadak Ranger Station to summit trail is 17.3 kilometers with a total traveling time of 9.5 hours (Table 3).

**Table 3. Facilities, size and activities in the Babadak Ranger Station to summit trail**

FACILITIES	SIZE/ AREA	DISTANCE			Time of Travel	ACTIVITIES
		From	To	Kms		
PA Office	257 M <sup>2</sup>	Baguio City	PA Office, Ambangeg, Bokod, Benguet	60	3 hrs	Briefing Buying station of souvenirs Viewing of photos Worshipping/Fellowship Meetins/Conference Lodging
Babadak Ranger Station/CENR Building	351 M <sup>2</sup>	PA Office	Babadak Ranger Station	10	5 hrs	Lodging Cooking Bathing Briefing Camping
Camp 1/ Waiting	62 M <sup>2</sup>	Babada	Camp I	2	1.17 hrs	Resting

shed		k Ranger Station				Bird watching Landscape viewing Summit viewing
Camp II	1,659 M <sup>2</sup> or 0. 1659 hectares	Camp I	Camp II	3.6	1.83 hrs	Camping Cooking Worshipping Socialization program Star gazing Trekking
Summit	95 M <sup>2</sup>	Camp II	Summit	1.7	1.5 hrs	Sunrise and sunset viewing Grassland/landscape viewing Picture taking Meditating Worshipping

Figure 3. Location of the different facilities along the Babadak – summit trail



### **B.2.2 Akiki Trail (Killer Trail - Fig. 2)**

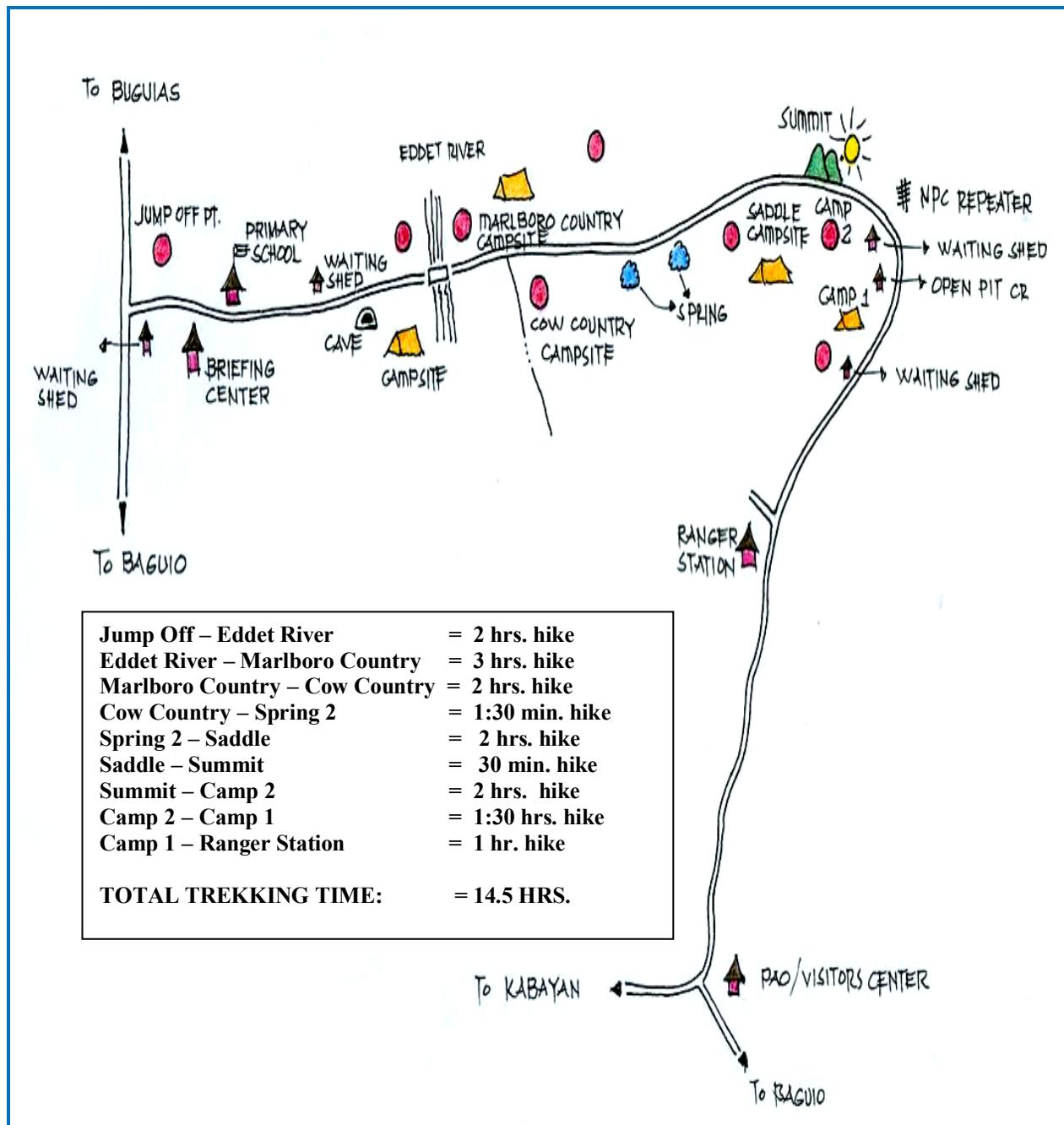
The Akiki trail or killer trail is suited for the expert/professional trekkers. This route offers the steepest and most challenging hike in the park. The Jump-off is Duacan, Kabayan, Benguet which is about 84 kilometers or 5 hours travel from the City of Baguio. Visitors take Norton Trans that runs three morning buses from Baguio City to Kabayan.

Prior to ascent, briefing is done at the briefing center by the Park Ranger/s. From the briefing area, visitors travel about two (2) hours to reach the Eddet River where visitors bathe, and rest/camp in designated camp sites which is near the river. Three (3) hours walk from the Eddet River is the Marlboro Country where camping could also be done. Other designated camping areas along the Akiki trail includes cow country which is 2 hrs hike from Marlboro country, and Camp III which is also 3.5 hrs walk from cow country. Camp III is the nearest camp to the summit which is only about 30 minutes walk. Visitors should start to walk as early as 4 o'clock in the morning to view the sunrise in the summit. This has an area of 2,407 m<sup>2</sup> or 0.2407 hectare with one (1) common pit for men and women. There is no waiting shed in the camp.

For visitors with private cars/vehicles and arrive early in the jump off usually camps in cow country or camp III. On the other hand, visitor who takes the Norton Trans bus and arrives in the afternoon sleeps first in the primary school near the briefing center, or camps in the Eddet River, then camp again for the second night in Camp III. Usually, visitors trekking the Akiki Trail end up to the PA Office in Ambangeg, Bokod, Benguet for sign out.

The total travel time for a visitor to reach the summit using the Akiki trail is 14.5 hours.

Fig. 2. Sketch map of the Akiki Trail (Killer trail)



**Table 4. Facilities, size and activities in the Akiki Trail**

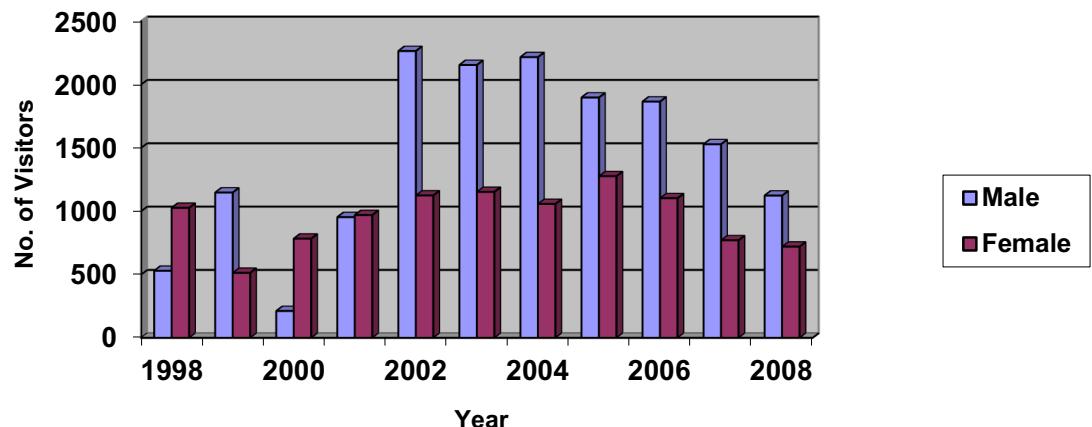
### B. 3. Profile of visitor

Profile of the visitors was gathered in the Protected Area and Wildlife and Coastal Zone Management Service (PAWCZMS) Office, Diego Silang Street, Baguio City. A total of 26,352 local tourists visited the Mt. Pulag National Park from 1998 up to the 1<sup>st</sup> quarter of 2008, composed 15,888 males and 10,492 females. The average total number of visitors per year is 2,396 with 1,444 and 954 male and female, respectively. The year 2002 had the highest number of local visitors (3,388) and the least was in 2000 with only 995. These visitors came from different regions or provinces in the Philippines and from different organizational affiliations (Table 5).

**Table 5. Total Number of Local Visitors in Mt. Pulag from 1998 – 1<sup>st</sup> Quarter of 2008**

YEAR	MALE	FEMALE	TOTAL
1998	529	1,026	1,555
1999	1,147	513	1,660
2000	212	783	995
2001	953	969	1,922
2002	2,264	1,124	3,388
2003	2,154	1,152	3,278
2004	2,216	1,057	3,273
2005	1,897	1,276	3,173
2006	1,865	1,102	2,967
2007	1,528	770	2,298
2008	1,123	720	1,843
<b>TOTAL</b>	<b>15,888</b>	<b>10,492</b>	<b>26,352</b>
<b>MEAN</b>	<b>1,444</b>	<b>954</b>	<b>2,396</b>

**Figure 4. Graph showing the number of Local visitors in Mt. Pulag National Park**

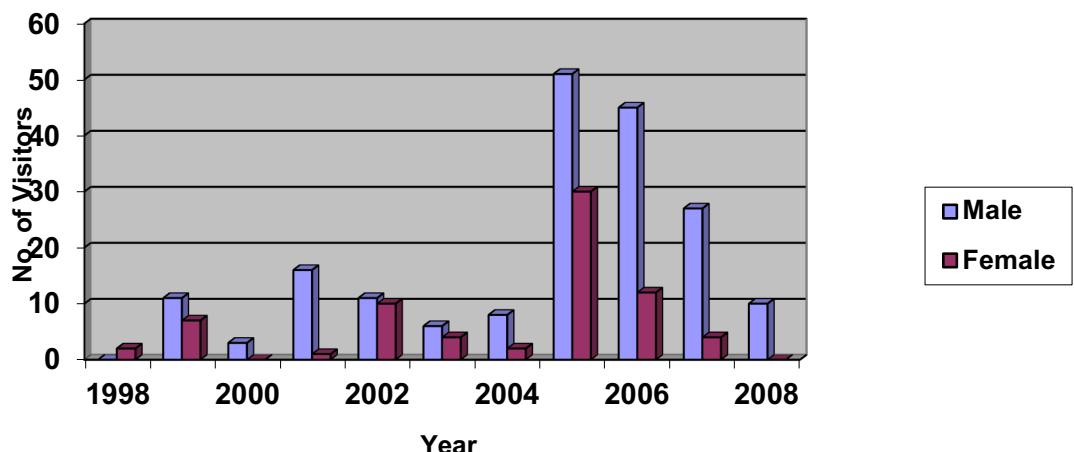


As regard the number of foreign visitors, a total of 290 tourists visited the Mt. Pulag National Park (Table 6). There were 188 males and 72 females. The average foreign visitors for 10 years and 1 quarter were 24 persons per year at 17 males and 7 females. The highest number of foreign visitor was recorded in 2005 with 81 tourists composed of 51 males and 30 females.

**Table 6. Total Number of Foreign Visitors in Mt. Pulag from 1998 – 1<sup>st</sup> Quarter of 2008**

YEAR	MALE	FEMALE	TOTAL
1998	0	2	2
1999	11	7	18
2000	3	0	3
2001	16	1	17
2002	11	10	21
2003	6	4	10
2004	8	2	10
2005	51	30	81
2006	45	12	57
2007	27	4	31
2008	10	0	10
<b>TOTAL</b>	<b>188</b>	<b>72</b>	<b>260</b>
<b>MEAN</b>	<b>17</b>	<b>7</b>	<b>24</b>

**Fig. 5. Bar graph of foreign visitors in Mt. Pulag National Park**



Based from the result of interview and observation, the rotation coefficient of visit in the park for 24 hours is one (1) considering the total time of travel in reaching the summit to view the spectacular sunrise at about 4:45 to 6:00 o'clock in the morning.

#### **b.4. Prevailing fee rates in the Park.**

There are several fees collected and the rate depends on the number of visitors, tour guides, routes and duration of stay. These rates of fees were approved by the Protected Area Management Board (PAMB) members (Table 7).

The entrance fee which is paid at PA Office in Ambangeg, Bokod, Benguet amounts to P100, camping fee of P 50.00 and green fee of P25.00. The students are entitled to a 20% discount for entrance fee and 20% discount for green fee. The green fee is remitted to the Municipality of Kabayan. The other fees paid are remitted to the Integrated Protected Area Fund (IPAF).

Regarding the fee for tour guides, the rate following the Ranger station – grassland route for a group composed of 1-7 visitors/members is P500.00. This is lower than the rate for a tour guide following the Akiki Jump Off to grassland route with the same number of group members which is P1,200.00 for two (2) nights. The higher the number of visitors,

the higher the number of tour guides needed, and the higher the amount paid by the tourist. An additional cost of P300.00 is paid to the tour guide for every one night extension. Likewise, the Porter fee for the Ranger Station – grassland route is lower than the Akiki Jump Off – grassland route which are P250.00-300.00 and P1,200.00, respectively.

**Table 7. Prevailing fee rates in the Protected Area**

**A. Ranger Station – Grassland route**

<b>Number of tour guides</b>	<b>Number of visitors</b>	<b>Corresponding Amount (P)</b>	<b>Duration of Stay</b>
1	1-7	500	2 days and 1 night
1	8	800	2 days and 1 night
1	9	900	2 days and 1 night
1	10	1,000	2 days and 1 night
2	11	1,100	2 days and 1 night
2	12	1,200	2 days and 1 night
2	13	1,300	2 days and 1 night
2	14	1,400	2 days and 1 night
2	15	1,500	2 days and 1 night
2	16	1,600	2 days and 1 night
2	17	1,700	2 days and 1 night
2	18	1,800	2 days and 1 night
2	19	1,900	2 days and 1 night
2	20	2000	2 days and 1 night

**B. Akiki Trail**

<b>Number of tour guides</b>	<b>Number of visitors</b>	<b>Corresponding Amount (P)</b>	<b>Duration of Stay</b>
1	1	1,000	2 nights
1	2-7	1,800 – Ranger Station – Akiki Jump Off	2 nights
		1,800 – Akiki Jump off – Grassland – Ranger Station	2 nights
		2,000 – Akiki Jump Off – Grassland – Akiki Jump Off	3 nights
1	8	1,900 – Ranger Station – Grassland – Akiki Jump Off	2 nights
		1,900 – Akiki Jump Off – Grassland – Ranger Station	2 nights
		2,100 – Akiki Jump Off – Grassland – Akiki Jump Off	3 nights

**C. Porter rates**

<b>Number of Porter</b>	<b>Routes</b>	<b>Amount/Fee (P)</b>
1	Ranger Station – Grassland	250 – 300
1	Ambangeg – Ranger Station	400
1	Akiki Jump Off – grassland	1,200
1	Ballay – Tawangan – Grassland	2,500 – 3,000
1	Grassland – Ballay	2,500 – 3,000

**D. Other Fees**

<b>Number of Visitor</b>	<b>Kind of Fees</b>	<b>Amount/Fee (P)</b>
1	Entrance fee	100
1	Camping fee	50
1	Green Fee	25

## C. MANAGEMENT PERSPECTIVE (PARK MANAGERS AND OFFICIALS)

### C.1. Profile of the respondents (PA management group)

With a total of fourteen (14) respondents, the same numbers of male and female were interviewed. Among the respondents, three (3) are park rangers (21%) who are directly manning the Protected Area, two (2) occupies a position of Forester I and also two (2) are Senior Environment and Management Specialist. Other interviewees are holding a position of Supervising Environment and Management Specialist, Environment and Management Specialist I, Community Development Officer II, a Protected Area Management Board (PAMB) member, and the Protected Area Superintendent (PASu) who heads the supervision and management of the Protected Area on site.

Forty two percent (42%) of the respondents are from the Protected Area and Wildlife Coastal Zone Management Service (PAWCZMS), 29% are both from Community and Environment and Natural Resources, Baguio City (CENRO-Baguio) and Mt. Pulag, National Park Protected Area Office.

**Table 8. Demographic Profile of the Protected Area Managers**

VARIABLES	POSITION/LEVEL	FREQUENCY	PERCENTAGE (%)
Sex	MALE	7	50
	FEMALE	7	50
Position	Sr. EMS	2	14
	EMS1	1	7
	SpvgEMS	1	7
	CDO II	1	7
	PASu	1	7
	Park Rangers	3	21
	Forester 1	2	14
	PAMB member	1	7
	PAWCZMS	6	42
Office	CENRO Baguio	4	29
	Mt. Pulag	4	29

## C.2. Assessment of Mt. Pulag with respect to the condition of some of the attraction sites

Some of the attraction sites within the park were assessed based from the result of the analyses of the interview conducted to the PA managers, and observations. Some of the problems identified were treated as limiting factors affecting the use of the facilities by the users (Annex 1).

In the Protected Area Office (PAO) at Ambangeg, Bokod, Benguet, the identified problems are lack of water during summer season, the need for a wider parking space, limited space of the briefing area, limited souvenir displays, number of shelves, number of kiosk, lodging rooms, bathroom and comfort rooms. All of these identified problems on the use of the PA office affect the user's comfort especially if the visitors are more than 50. Interview result showed that combination of any of the identified problems affects 29% of the PA managers interviewed. All the problems mentioned affects 71% of the PA managers (Annex 1).



For the Babadak Ranger Station and CENRO building, the problems were roof drips during heavy rainfall, limited



space for accommodation, limited comfort rooms and cooking area. The two buildings' roofing should be repaired and broken windows should be replaced. The



problems on space for accommodation, limited comfort rooms and cooking areas were observed as a problem when more than 50 visitors will stay in the station. Fifty eight (58) percent of the total PA Manager's respondents observed that combination of any of the problems affects them while the problem on the condition of the two buildings that drips during heavy rainfall need immediate repair affects 14 % of the respondents. All of the identified problems worried 28% of the PA manager respondents (Annex 1).

The limited number of waiting shed and its condition is a problem in Camp I. The waiting shed has no sidewalls to protect the visitors especially during heavy rainfall with strong winds. Since the shed was designated as a resting area of traveling visitors, provision of pit for men and women is needed. Source of water was also identified as a problem in the camp. All these problems were 100% identified by the PA management respondents.

Campsite II is situated in the ecotone of mossy forest and grassland areas. With an area of 1,658.993 sq. m or 0.166 hectare, the size of the camp is still identified as a problem especially when the number of visitors are big. Other problems mentioned include the limited number and conditions of pits for

men and women, and waiting



shed. The pits have no roof tops and sidings were just covered with some pieces of corrugated iron and bunch of rono (*Mischantus sinensis*) that can be easily destroyed by strong typhoons. The provision of additional waiting shed, separate pits for men and women will improve the comfort

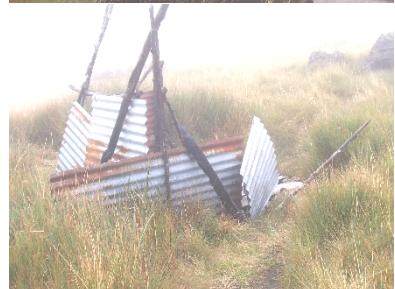
of the stakeholders who will use the facilities in the area. From the total PA managers interviewed, the problem on size of the camp, number of pits for men and women and their uncomfortable condition affect 7% each the respondents. Fourteen percent (14%) of the respondents said that the insufficient number of waiting shed is a problem.

Combination of any of the problems mentioned shared 37%. Observation also showed that part of the camp is already devoid of vegetation that should be revegetated.



Camp site III is the widest camp with an area of 2,406.497 sq.m or 0.241 hectare. It is the

nearest camp to the summit when traversing the Akiki killer trail. The absence of waiting shed, insufficient number of pit and its uncomfortable condition, lack of water during summer season were the problems in the camps that affects the comfort of every stakeholder that camp in the area. Because it is very cold and the camp has no waiting shed to shield during thunderstorm, there is a need to build at least one (1) waiting shed in the area. This will serve as a resting place not only for the visitors but for the community members traversing the park and the forest rangers manning the Protected Area. Further, with the status of the lone common pit for men and women, immediate construction of separate pit for men and women should be undertaken. All these problems were identified by the 14 PA managers interviewed.



The tower/relay station is an alternate site to view the spectacular sunrise and sunset in Mt. Pulag. It is nearer when traversing the Babadak – summit route than the summit. This attraction site has no facilities like comfort room and shed that limits the time of stay of every stakeholder in the area. These are the problems identified by the all the PA manager respondents interviewed.

The summit has an elevation of 2,935 masl. It has an area of 95 sq. meters. The limited size is a problem that it cannot accommodate great number of visitors. The accommodation of visitors in the summit is also affected by the dense dwarf bamboos of about 1 meter height occupying about 10m<sup>2</sup>. Other problems identified include the windy condition, extreme cold and poor visibility starting from 9AM. These problems however are natural beyond the control of man. Likewise, soil and vegetation degradation were also noticed in the summit that needs to be addressed by the management to prevent further degradation of the area. One hundred (100) percent among the management respondents identified these problems.



Mt. Tabayok is another peak in the park. The absence of pit for men and women, the very cold condition in the area were the problems identified by 64% of the PA respondents. Result of interview showed that 21% did not answer considering that they did not visit the area (Annex 1).

The Ambulalakaw Lake has no facilities like waiting shed, comfort rooms and picnic tables, and the extremely cold condition in the area. Combination of any of these problems affected seventy two (72) percent of the respondents and 14% said that all these are the problems in the area (Appendix 1).

### **C.3. Problems in the management of the PA and solutions proposed by the PA managers**

Interviewed PA managers identified problems that affect the management of the park (Table 9). Possible solutions were also identified to address these problems.

Table 9. Identified problems by the PA Managers in the management of the protected area.

<b>Problems</b>	<b>Solutions</b>
Accessibility/transportation problem from PA Office to Babadak Ranger Station	- Source out fund (congressional/pork barrel) for the improvement of Ambangge to Babadak road.
The cultivation areas create life-soar to tourist especially to environmentalist	- Develop the cultivated areas into a sustainable and presentable SALT farm to form part of the tourist attraction
Wrappers of food/scattering of garbage seen in the area	- Strict implementation of PA rules and regulations
Visitors are sometimes wild/shouting	Tour guides must have to assert his/her authority in implementing rules and regulations
Endemic plant collection	Strict implementation of forestry rules by the PA managers
Absence of waiting sheds in Camps I, II, III	Provide additional waiting shed in Camps I and II, and construct at least one in Camp III
Condition of the waiting sheds	Put up walls of waiting sheds in camps I and II
Illegal clearings/swidden/kaingin farming	Intensify law enforcement
Very few number of park rangers to man the PA	Source out additional funds for employment of forest guards/Park Rangers
Cooking materials left in the area which caused explosion	Require visitors to bring home their wastes/garbage
Stealing – visitors experienced lost of personal belongings	Guides were instructed to be vigilant
Forest fire/grassland fire occurrence	Intensify IEC to the different communities and organize fire brigades in these communities
Guide and visitors – misunderstanding because of fee	Tour guides to fully explain about the payment of fees
Lost way/out of way	Slow hikers were advised to go first before others for them to be monitored
Health problems of visitors or accidents like sprains	Hikers were advised to bring with them first aid kits
Land conversion from forest to agricultural lands	Survey of gardens should be undertaken so that expansion will be avoided, Intensify IEC and forest protection
Multiple Land Tenure Instruments (LTI) issued to communities within the Park	Stop issuance of LTI for the protection of the park
Denuded Forested Area	Rehabilitate/reforest denuded areas
Soil compaction along the trail	Regulate number of visitors through carrying capacity assessment

## **D. COMMUNITY PERSPECTIVE**

### **D.1. Socio-Demographic Characteristics of the Community (Table 10)**

A total of thirty five (35) respondents were interviewed in the community. Eighteen (18) are males (51%) and seventeen (17) are females (49%). The respondents' age ranged from 15 to 68 years old. Majority of the respondents are aged 15 – 20 years old (31%), fourteen percent (14%) are 21-25 years old, and eleven percent (11%) are from ages 36-40 and 41-45. The oldest respondent is a 68 year old man who had been visiting the National Park. Respondents have high literacy rate for all of them (100%) had undergone formal schooling: 43% for tertiary education (37% college level and 6% college graduate), 28% secondary education (17% high school level and 14% graduate), 20% primary level (14 % graduate and 6% undergraduate), and 6% post graduate (Table 10).

With regard to the household type, 22% belongs to nuclear type where the household consists of a mother, a father and children. Eleven percent (11%) belongs to the extended type where the respondents are living with their parents/children, grand parents and other relatives. Two (2) respondents did not answer to where household they belong. In household size, a big percentage (51%) had household size of 6-10, followed by 1-5 (37%) and the rest (12 %) have 11-15 house hold size.

The religious sect in the area is very diverse. Majority (28%) are Roman Catholic, followed by 17% Born Again Christian, Baptist (12%), Lutheran (11%) and 30% belong to other religious sect like Church of Christ, Life in the Spirit Fellowship, Anglican, TCDNCI and Christian Church. Three (3%) did not reveal the sect they belong.

The community respondents have been living in their respective barangays for a number of years. Twenty six (26%) are living in the area for 16-20 years, 20% for both 16-20 and 31-35 14% for both 6-10, and 11-20 years. Others stayed for 1-5 years, and 36 years above (6%) (Table 10).

**Table 10. Socio-Demographic Characteristic/Profile of the Community**

VARIABLES	LEVEL	FREQUENCY	PERCENTAGE
Sex	MALE	18	51
	FEMALE	17	49
Age	15-20	11	31
	21-25	5	14
	26-30	2	6
	31-35	1	3
	36-40	4	11
	41-45	4	11
	46-50	3	9
	51-60	2	6
	61-65	2	6
	66-above	1	3
Educational Attainment	Elementary level	2	6
	Elementary Graduate	5	14
	High School level	6	17
	High School Grad.	5	14
	College Level	13	37
	College Graduate	2	6
	Post Grad. Level	0	0
	Post Graduate	2	6
Household Type	Nuclear	22	63
	Extended	11	31
	No Answer	2	6
Household Size	1-5	13	37
	6-10	18	51
	11-15	4	12
	15 and above	0	0
Religion	Roman Catholic	9	28
	Lutheran	4	11
	Christian Church	2	6
	TCDNCl	1	3
	Baptist	4	12
	Pentecost	3	9
	Church of Christ	1	3
	Born Again Christian	6	17
	Life in Spirit Fellowship	2	6
	Evangelical	1	3
	Anglican	1	3
	No Answer	1	3
No. of years of Residence in the Barangay	1-5 years	1	3
	6-10 years	5	14
	11-15 years	5	14
	16-20 years	9	26
	25-30 years	7	20
	31-35 years	7	20
	36 years and above	1	3

## D.2. Economic profile of the Community

One hundred percent (100%) of the community respondents interviewed are engaged in farming and seventeen percent (17%) are also tour guides (Table 11). In the park, about more than 70 community members act as tour guides. With the great number, rotation in tour guiding is being practiced and facilitated by the officers and members of their organization called Mount Pulag Indigenous Tour Guide Association (MPITGA). This income generating activity plays an important role to the community's life. Their earnings support the education, food and clothing of their families. Thus, the ecotourism in the area should be sustained for the community's economic benefits. Likewise, nine percent (9%) of the respondents are engaged in selling their farm produce either in the nearby barangays (public market) or direct to the City of Baguio depending on the volume of the harvest. Potato, cabbage, sweet peace, carrots and other leafy vegetables are being raised in the area.

**Table 11. Respondents' activities in the area**

VARIABLES	FREQUENCY	PERCENTAGE (%)
Farming (1)	35	100
Farming and vending	3	9
Farming and tour guiding	6	17

In terms of farming size, 60% have below 1 hectare farm lot. Twenty nine percent (29%) have 1 – 2 hectares, 6% have about 2.1 – 3 hectares and 6% have more than 3 hectares (Table 12). With the size of the farms which are being tilled by the respondents, majority (89%) are not satisfied (Table 13). They need additional areas ranging from 1-3 hectares for a greater produce to cater the financial needs of their families. Twenty six percent (52%) need additional 2-3 hectares while 13 % need only a hectare to be satisfied (Table 14).

**Table 12. Farming size**

VARIABLES	FREQUENCY	PERCENTAGE (%)
Below 1 hectare	21	60
1.1 ha – 2 has	10	29
2.1 – 3 has	2	6
3.1 – 4 has	1	3
4.1 – 5 has	1	3

**Table 13. Satisfaction of the area farmed**

VARIABLES	FREQUENCY	PERCENTAGE
Yes	4	11
No	31	89

**Table 14. Additional needed farm area**

VARIABLES	FREQUENCY	PERCENTAGE
1 hectare	4	13
2 hectares	8	26
3 hectares	8	26
No answer	11	36

Aside from farming, vending and tour guiding, respondents want also to be engaged in other livelihood projects. Thirty five percent (35%) want to have piggery; 26% prefer to plant fruit bearing trees; 28% for development of fishpond, production and selling of different souvenirs; and 11% want to have poultry and furniture shop (Table 15).

**Table 15. Other activities the respondents' want to do in the area**

VARIABLES	FREQUENCY	PERCENTAGE
Plant fruit bearing trees	9	26
Hog raising	12	35
Poultry, furniture industry	4	11
Fish Pond	5	14
Production and selling of souvenirs	5	14

## D.2. Community Perspective on the assessment of the Ecotourism Activity in the Area

The community's assessment on the condition of the attraction site is very important to consider in the sustainability of ecotourism in Mt. Pulag National Park. There

observation on some of the problems (Annex 1) will not only address the visitor's concern and satisfaction but will perhaps help the residents in the area economically.

The respondents in the community noted that the Protected Area Office (PAO) lacks water during summer season, a wider parking space is needed and limited souvenirs displayed. The need for a wider parking space was raised since the road side below the office is being used as parking area when the PA office compound is already full. This situation is dangerous to passersby especially when pupils/students passes through the narrow road. The community would like also to have souvenirs display in the office that would also augment their meager income from farming. Interview result showed that combination of any of the identified problems affects 11% of the community interviewed and all of these problems affect 17% of the interviewees (Annex 1). A big percentage of 31% however have no response about the condition of the PA office.

In the Babadak Ranger Station and CENRO building, community observed that both buildings drip during heavy rainfall. The levels of satisfaction of visitors who stay in the buildings are definitely affected. The very cold condition also in the area is a problem by the community. Forty eight (48) percent of the total community respondents are affected by identified problems and combination of the two problems affects 9% of them. Forty three (43) percent have no response.



The limited number of waiting shed in camp I and its condition is a problem to the community. People from barangay Tawangan and other community members passing through the Babadak-summit trail usually rest in the shed. Additional shed is needed especially when large numbers of visitors and community members rest in the shed at the same time. The need to provide sidings of the waiting shed is also necessary to protect the users especially during heavy rainfall with strong winds. The lack of comfort rooms/pit for men and women, source of water were also identified as problems in the camp. Combination of any of these problems concerns 45% of the community

respondents and all these problems affects 23% of the respondents.

Camp II offers a bigger area to campers. However, with the expected number of visitors that camp in the area, the limited number and conditions of pits for men and women, and waiting shed are the problems identified based from the assessment of community respondents. The pits having no roof tops and temporary sidings covered with some pieces of corrugated iron and bunch of rono (*Mischantus sinensis*) affects the comfort and use by the users. The sidings of the waiting shed needs also covering for the protection of users from heavy rainfall and strong winds. Twenty three (23) percent from the community respondents are uncomfortable about the insufficient number of pit for men and women, and six (6) percent for the condition of the pit for women. A big percentage of (43%) from the respondents identified a combination of any of these problems that affects every user of the camp facilities.



In Camp III, the respondents identified the absence of waiting shed, insufficient number of pit and its uncomfortable condition and lack of water during summer season. The construction of at least one (1) waiting shed will provide protection for the community and trekkers from thunderstorm, especially that it is very cold in the area. Twenty (20) percent from the respondents identified this as a problem in the camp. On the other hand, no separate pit for men and women and construction of additional pits each for both sexes is deemed necessary. The pits should have rooftops and coverings for the comfort of the users. Fourteen (14) percent of the community respondents noted this as a problem that should be taken into consideration in the management of the camp. The combination



of any of these problems affects 31% from among the respondents and 20% identified all these as a problem.

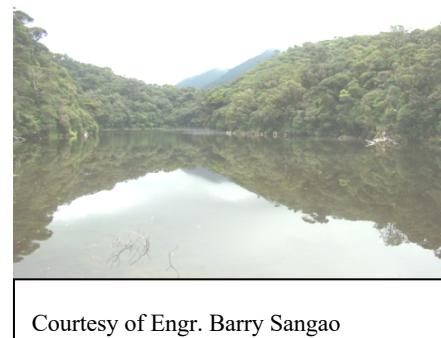
The tower/relay station which is the alternate viewing site for sunrise and sunset has no facilities like comfort room and shed that concerns 100% of the community respondents.

Soil and vegetation degradation is the problem identified by the respondents not only on the summit but also in the trails crossing the grassland areas. Other problems include the windy condition, extreme cold and poor visibility in the area especially during rainy months. The problems on soil degradation and poor visibility have both a 14% share from the respondents' answer. Any combination of these problems affects 17% of the respondents. Thirty one percent (31%) of the community respondents identified these as problems (Annex 1).



Mt. Tabayok is another peak in the park usually trekked by experts. The absence of pit for men and women were identified by 9% of the community respondents. Likewise, the construction of shed shares 3% from the respondents. A total of 66% respondents noted these as problems in the area and 23% respondents have no idea on the problems in Mt. Tabayok.

The adjudged cleanest inland body in the region has also no facilities like waiting shed, comfort rooms and picnic tables as identified by 23% of the respondents. Likewise, some (6%) community respondents noted that some portions of the mossy forest near the Ambulalakaw Lake are being destroyed/converted to other land uses. The conversion of the mossy forest into an agricultural area is a threat in the lake which also



Courtesy of Engr. Barry Sangao

blots the natural landscape of the area. All these problems identified affects forty nine (49) percent of the community respondents and combination of any of these affects 23% of them.

### **D.3. Problems identified by the community in the management of the PA and the proposed solutions**

In the management of the PA, the immediately affected on the impacts are the community members living within and outside the park. Respondents from the community members identified potential and existing problems and identified possible solutions for the improvement and sustainability of the ecotourism in Mt. Pulag Naitonal Park (Table 16).

Table 16. Identified problems by the Community respondents in the management of the protected area

<b>Problems</b>	<b>Solutions</b>
Occurrence of Forest Fire	The community should be vigilant in the protection of the PA. Employ more forest guards from the community
Poor condition of the road from the PAO to Babadak	Source out funds for the rehabilitation of the road/cementing. A counter part from the community members should be provided i.e. labor
Expansion of vegetable gardens that destroy the forest vegetation	Government should provide alternative source of income/livelihood to the community
Insufficient number of park rangers	Employ additional park rangers from every barangay covered by the PA for more effective protection of the PA
Lack of waiting sheds in some tourist attraction sites	Construct waiting shed in camps I, II and III. Concerned community members should also have counterparts in the construction of the needed waiting sheds.
Condition of the waiting sheds	Put up walls of waiting sheds in camps I and II
Parking space in PAO	Additional parking space in PAO should be provided. If possible, the school ground near the PA office should be opened as parking space. This should be negotiated by the PA managers.
Forest destruction near the Ambulalakaw lake	Strict implementation of PD 705. Identify culprits and penalties should be imposed.

## **E. VISITORS' PERSPECTIVE**

### **E.1. Profile of the respondents**

A total of forty nine (49) visitors were interviewed. Interviews were done during their visit in the Protected Area, and in their houses/offices. Majority (55%) of the respondents belong to the male sex. Only 45% belong to the opposite sex. Most of the respondents are aged 20-30 years old (41%) followed by 31-40 years old (29%), then 20 years old and below (18%), and the least is from 51-60 years old of 4% (Table 17). Respondents have high literacy rate where 51% were college graduate, 27% were college undergraduate and 10% were post graduate. Generally, the visitors were Roman Catholic (74%), twenty percent (20%) are protestant while the rest (6%) belong to other groups. The visitors have different organizational affiliations. Majority of them (31%) are members of the mountaineering clubs coming from different regions, eight percent (8%) are members of lions' club and haribon foundation. Thirty seven percent (37%) from other organizations like Phi Sigma, knights of Columbus, Soroptimist International, Baguio Foresters Society, Soluzions Phils., DENR, and Environmental trekkers. Twelve (12%) did not answer.

Of the 49 visitors, sixteen (16) or 33% were Ilocanos, sixteen percent (16%) are Tagalogs, and twenty six percent (26%) are Igorots coming from tribes of Ibaloi, Kankanaey and Kalanguya. Other visitors are Bicolanos, Kapampangan, Bisaya, Ibanag, Applai and a Chinese Citizen comprising a total of twenty four percent (24%).

**Table 17. Socio-Demographic Characteristic Profile of the Visitors**

VARIABLES	LEVEL	FREQUENCY	PERCENTAGE
Sex	MALE	27	55
	FEMALE	22	45
Age	Below 20	9	18
	21-30	20	41
	31-40	14	29
	41-50	4	8
	51-60	2	4
	61- up	0	0
Household size	Below 5	28	57
	6-10	20	41
	11-up	1	2
Educational attainment	College Level/undergraduate	17	35
	College Graduate	25	51
	Post Graduate	5	10
	No answer	2	4
Religion	Roman Catholic	36	74
	Protestants	10	20
	Anglican	1	2
	Baptist	2	4
Organizational affiliation	Phi Sigma	3	6
	Knights of Columbus	2	4
	Lions club	4	8
	Soroptimist International	2	4
	Baguio Prof. Foresters Society	2	4
	Soluzions, Phils.	2	4
	Mountaineering Clubs	15	31
	Environmental trekkers	1	2
	Haribon Foundation Phils.	4	8
	DENR	1	2
	Others	6	12
	No answer	7	14
Ethnic Group	Ilocano	16	33
	Tagalog	8	16
	Ibaloi	6	12
	Kalanguya	3	6
	Kankanaey	4	8
	Applai	2	4
	Ibanag	2	4
	Bisaya	2	4
	Kapampangan	2	4
	Bicolano	3	6
	Chinese	1	2

## E. 2 ECONOMIC PROFILES OF THE RESPONDENTS

### B.1 Visitors' source of income

Majority (24%) of the respondents are Government employees who are employed as Researchers (10%), Clerks (8%), Accountants (4%) and Auditor (2%). Private Company Employees constitute 22% who are also employed as Call Center Agents (6%), Bank Employees (6%), Geodetic Engineers (4%), IT professionals (4%) and Senior Sale Representative (2%). The visitors engaged in business represents 16%, consultants are 10%, driving (6%), HR specialist (4%) and journalist (4%). Others have no primary source of income since they are housewives and students (Table 18).

**Table 18. Primary Source of Income of visitors**

OCCUPATION	FREQUENCY	PERCENTAGE (%)
Government Employee	<b>12</b>	<b>24</b>
- Auditor	(1)	(2)
- Clerk	(4)	(8)
- Accountant	(2)	(4)
- Researcher	(5)	(10)
Private company employee	<b>11</b>	<b>22</b>
- Geodetic Engineer	(2)	(4)
- Senior Sales Executive	(1)	(2)
- Call Center Agent	(3)	(6)
- Bank Employee	(3)	(6)
- IT professional	(2)	(4)
Jeepney Driver	3	6
Journalist	2	4
Consultant	5	10
HR Specialist	2	4
Salesman/Businessman	8	16
Students	4	8
None (housewife)	2	4

As to the monthly income, 31% of the respondents have salary ranging from P10,001 – 20,000 and 20% have revenue ranging from P20,001-30,000 monthly. Eight percent (8%) have monthly income of more than P50,001, and 6%, 4% and 2% have income ranging from P30,001-40,000, below 10,000, and P40,001-50,000, respectively. Fourteen (14) respondents or 29% did not reveal their monthly income (Table 19)

**Table 19. Monthly Income of the Visitors**

VARIABLES	FREQUENCY	PERCENTAGE
Below P10,000	2	4
10,001-20,000	15	31
20,001-30,000	10	20
30,001-40,000	3	6
40,001 –50,000	1	2
50,001-up	4	8
No Answer	14	29

Other respondents have other secondary sources of income to augment their monthly revenues (Table 20). Sixteen percent (16%) drive taxis, 10% do carpentry works and 6% have sari-sari stores while 33 % did not answer.

**Table 20. Visitors' secondary source of income**

VARIABLES	FREQUENCY	PERCENTAGE
Sari-sari Store	3	6
Carpentry	5	10
Taxi Driver	8	16
No Answer	33	67

Monthly expenditures are classified into five (5) categories: food, clothing, education, health and transportation (Table 21).

The highest expenses are incurred for food (43%) with income bracket of below P5000 followed by P5001-10,000 a month (29%). Only 8% and 4% revealed that they spend food for an amount of P10,001 - 15,000 and P15,001-2000, respectively. However, 16% of the respondents have no answer.

On the other hand, about 70% spends money below P5,000 for clothing per month and 29% spend about P5,001 – 10,000. Zero from the respondents spends above 10,000. As regards education, still most of the respondents spend below 5,000 (31%) a month and only 2% spend about more than P5,001 – 10,000. Majority (78%) of the respondents however have no response about their expenses on education. Moreover, visitors (31%) usually spend below P5,000 for the maintenance of their health. Others have no response (69%) on how

much do they spend for medication. Further, thirty seven percent (37%) of the respondents revealed that they use up below P5,000 of their income for transportation in going to their work places. Others spend P5,001 – 10,000 (4%) and 10,001-15,000 (2%) per month.

**Table 21. Monthly expenditures for food, clothing, education, health and transportation of the visitors**

VARIABLES	FREQUENCY	PERCENTAGE
<b>FOOD</b>		
Below 5,000	21	43
5,001-10,000	14	29
10,001-15,000	4	8
15,001-20,000	2	4
20,001 – up	0	0
No Answer	8	16
<b>CLOTHING</b>		
Below 5,000	34	70
5,001-10,000	7	14
10,001-15,000	0	0
15,001-20,000	0	0
20,001 – up	0	0
No Answer	8	16
<b>EDUCATION</b>		
Below 5,000	10	20
5,001-10,000	1	2
10,001-15,000	0	0
15,001-20,000	0	0
20,001 – up	0	0
No Answer	38	78
<b>HEALTH</b>		
Below 5,000	15	31
5,001-10,000	0	0
10,001-15,000	0	0
15,001-20,000	0	0
20,001 – up	0	0
No Answer	34	69
<b>TRANSPORTATION</b>		
Below 5,000	18	37
5,001-10,000	2	4
10,001-15,000	1	2
15,001-20,000	0	0
20,001 – up	0	0
No Answer	28	59

### E.3. TOURISM/RECREATIONAL PREFERENCE OF VISITORS

The visitors of the Mount Pulag National Park are coming in group as revealed by all respondents (100%). Thirty three percent (33%) of the respondents disclosed that the group is composed of 21-30 individuals, and 29% of them said that some are 10 and below members per group (Table 25). Twenty four percent (24%) are visiting the park with members 11-20; eight percent (8%) are with members 31-50, and 4% with group members of 61-80 members. The group members consist of officemates (27%), friends (25%), club members (18%), family members or relatives (16%) and Schoolmates/students (8%) (Table 22).

**Table 22. Manner of visit, number and composition of group members visiting the park**

VARIABLES	LEVEL	FREQUENCY	PERCENTAGE (%)
Manner of Visit	Individual	0	0
	Group	49	100
Number of group members	10 and below	14	29
	11-20	12	24
	21-30	16	33
	31-40	2	4
	41-50	2	4
	51-60	0	0
	61-70	1	2
	71-80	1	2
	81-90	0	0
	91-100	1	2
Composition of group members	100 – up		
	Family members/relatives	8	16
	Friends	12	25
	Officemates	13	27
	Schoolmate/students	4	8
	Club members	9	18
	No answer	3	6

As regards the reasons for the visits, thirty nine percent (39%) said that it is for recreation and adventure while 22% revealed that it is for educational tour/field trip. Other reasons include the visit of the second highest mountain in the Philippines and as tourist spot

(14%), six percent (6%) for nature viewing and four percent (4%) want to see the virgin Ambulalakaw Lake (Table 23).

**Table 23. Reasons for visit and type of visit**

VARIABLES	LEVEL	FREQUENCY	PERCENTAG (%)
Reasons For Visit	For recreation/adventure	19	39
	Educational tour/field trip	11	22
	Curiosity	5	10
	To feel the coldness of the peak	2	4
	Tourism	7	14
	To see the virgin ambulalakaw lake	2	4
	Nature viewing	3	6
Type of Visit	Hard	21	43
	Soft	28	57

The visit in the park are classified into two types; the hard and soft visits. The hard visit is when the visitors will camp in the designated camping areas and will stay in the park for more than a day while the soft visit is that when the visitors will not camp and immediately leave the park. Fifty seven percent (57%) have the soft type of visit considering the very cold temperature in the park especially during night time, while 43% have the hard type (Table 23).

There are facilities/attraction sites preferred by the visitors. Being the second highest mountain in the Philippines, the summit of the park is more preferred by the visitors (25%). The camping areas are also preferred with a score of 16%. However, many visitors (33%) preferred all the attraction sites/facilities or the combination of any of the tourist spots within the park (Table 24).

On the number of days of stay of the visitors, 57% only stays in the park for one day. Usually, visitors climb the Mount Pulag starting from the Protected Area Office in Ambangeg up to the ranger station in the afternoon. After which, visitors stay at the ranger station and at 2 AM early morning of the following day, visitor starts to trek to reach the summit before 5 AM where the beautiful sun will start to rise. At the summit, starting at 9 AM, the area is cloudy that makes visibility poor already. This time the visitors return to the ranger station down to the Protected Areas office in Barangay Ambangeg, Bokod, Benguet on the same day and go home. Other visitors stay for 2 days (37%) and 3 days (6%). Nobody from the respondents stayed in the park more than three days (Table 24).

Table 24. Preferred attraction sites and number of days of stay by the visitors in the park

VARIABLE	LEVEL	FREQUENCY	PERCENTAGE (%)
Facilities preferred/ attraction sites	Camping areas	8	16
	Summit	12	25
	Lodging house with BR/CR	1	2
	PA office	2	4
	Combination of any of the attraction sites	10	20
	All of the above	16	33
Number of days stay during the visit	1 day	28	57
	2 days	18	37
	3 days	3	6

Thirty Seven (37) or seventy five percent (75%) of the respondents are willing to comeback to visit the park (Table 25). Of the 37 respondents, 41% want to revisit the park if they have available time and resources. Eight percent (8%) also wish to come during summer months for a better appreciation/view of the park and for safety considerations. Considering that some of the visitors are with their family members during their trek, 19% of the respondents are interested also to revisit the park with their children when they are strong

and old enough to climb the protected area. Others want to comeback after two years (8%) and when the attraction sites have already complete facilities like sheds, pits and others (5%).

In terms of willingness to pay on the fees collected in the park, 100% of the respondents are willing to pay. An additional of 50-300 pesos was noted for entrance fees/environmental as revealed by about 14% from the respondents and 61% are willing to pay the same rate being collected in the park. Twelve (12) or 32% have no answer if how much are they willing to pay (Table 25).

**Table 25. Reasons to revisit the park and willingness to pay for the fees collected in the park**

VARIABLE	LEVEL	FREQUENCY	PERCENTAGE (%)
Reasons and time to revisit the park	If there is available time and resources	15	41
	During summer time for better appreciation of the park Summit	8	21
	When children are big enough to climb the park	7	19
	After two years	3	8
	When there is complete facilities in every attraction sites	2	5
	No answer	12	32
Number of days of stay during the visit	1 day	28	57
	2 days	18	37
	3 days	3	6
Willingness to pay	P50	1	2
	P200	3	6
	P300	3	6

#### **E.4. DIFFERENT ATTRACTION SITES AND PROBLEMS/LIMITATION ON THE USE OF THE AREA/FACILITIES**

The different attraction sites within the park have problems/limitations that affect the use by the visitors (Annex 1). Some of these problems were treated as limiting factors.

In the Protected Area Office (PAO), the identified problem on lack of water during summer season affects 6% of the visitors and the need for a wider parking space also affects the visitors by 6% considering that the PA office has limited parking area. Souvenir displays are also available in the PA office. However, 2 % of the respondent visitors are not satisfied including the shelves (2%) where they are displayed. With a number of visitors per group that sometimes reach more than 90 persons, the number of kiosk within the PA office is a limiting factor. Two (2%) of the respondents from the visitor are affected. The number of lodging rooms further affects the visitors (6%), and comfort rooms and bathrooms limits the use by the visitors (2%). All these problems in the PA office affect the visitors (20%) or any combination of these limitations affects the respondents (47%) (Annex 1)

Regarding Babadak Ranger Station, two percent (2%) from the visitors' respondents are affected on the limited space for cooking/dining table. Usually, these are observed when greater number of visitors will stay in the buildings/ranger station. Another factor that limits the use of the ranger station is the additional camping and guiding fees (10%). That and additional one day stay in the station is an additional cost of P150 with corresponding additional guiding fee of P250.00. Further, the ranger station needs repair because the building drips during heavy rainfall that affects visitors' comfort (4%). Any combination of the different limitations limits the stay of the visitors (57%) in the ranger station. All these problems concern 20% of the respondents' visitors (Annex 1).

In Camp site I, the number one limitation is the number of waiting shed as responded by 16% of the visitors. The lone waiting shed in camp I is the first resting area to be

reached when traversing the Babadak – summit route. The condition also of the shed affects the comfort of the visitor by 2%. Though camp I is seldom use by visitors, comfort rooms should be constructed and this affect 6% of the visitors. The combination of any of these problems limits the use of the attraction area by the visitor respondents (31%), and all the mentioned limitations/problems affects 37% among the respondents, visitors (Annex 1).

The size of campsite II with an area of 1,658.993 sq. m or 0.166 hectare also limits its use to the visitors (12%) especially when visitors are in big numbers. Likewise, the insufficient number of pits for women, men and their uncomfortable condition limits the use of the camp for the visitors. The number of shed is also very important. Additional construction of waiting shed and the provision of sidewalls enhance the comfort or use of the camp by the visitors. The respondents from the visitors (16%) were affected by any combination of these limitations on the use of the camp. Likewise, all of these limitations are a problem to the 43% visitor respondents' visitors (Annex 1).

Camp site III is the widest camp with an area of 2,406.497 sq.m or 0.241 hectare. It is the nearest to in the summit when traversing the Akiki killer trail. There is no waiting shed in this camp despite of the very cold condition to shield hikers from thunderstorm. Two percent (2%) and 12% of the respondents from the visitors are affected of the problem by the coldness of the area and lack of waiting shed, respectively. Likewise, with the insufficient number of pits and the status of the lone common pit for men and women affects the stay of the visitors' respondents by 4% and 8% respectively. Lack of water during summer and the absence of other facilities like tables also affect the visitors stay. The combination of any of these limitations affected the respondents (4%). Moreover, all of these limitations affect the visitor respondents by 10% (Annex 1).

The tower/relay station is another site to view the sunrise and sunset in Mt. Pulag. It is nearer to reach when traversing the Babadak – summit route than the summit. This attraction site has no facilities like comfort room and shed that affects the visitors (10%). The poor visibility and the extreme coldness of the site also is a problem to the visitors. The combination of these limitations affected 29% of the visitors and all of the problems

identified limit the visitors at 33% (Annex 1).

The summit has an elevation of 2,935 masl. It has an area of 95 sq. meters. The limited space to view the spectacular sunrise and sunset, the beautiful vast grassland areas, and the other adjoining provinces/municipalities, affects 6% of the visitor respondents. The windy condition, extreme cold, poor visibility in the area starting from 9 AM also limits the time of stay of the respondents. Likewise, soil and vegetation degradation were also noticed in the summit that concerns 2% of the visitors. The combination of any of the limitations affected the respondents by 25%. Further, the limitations showed that visitors were affected by 31% (Annex 1).

In Mt.Tabayok, a big percentage (61%) from the visitors had no idea on the problems in the area but some of them identified the absence of shed (2%), non-availability of pit for men and women (2%), the very cold condition in the area (4%). Combination of any from the limitations affects 10% of the visitors and 20% are affected by all the identified problems (Annex 1).

The identified problems by the visitor respondents in Ambulalakaw Lake are: no facilities like waiting shed and pit (2%) and picnic tables (4%) and the extreme cold condition (10%) in the area. However, a big percentage (57%) from the visitors had not gone to the Ambulalakaw Lake or have no idea about the limitations identified. (Annex 1).

## **E.5 MOST POPULAR TOURIST ATTRACTION SITES IN THE PROTECTED AREA**

On the most attractive sites in the park, one hundred percent (100%) of the respondents from the visitors stated that summit is the number one (1) most popular attraction site in the Protected Area. The summit is the best place where to view the sunrise and sunset which every visitor aims to reach being the second highest peak in the Philippines (Table 26).

Sixty percent (60%) of the visitors claimed that Camp site II is the second most popular attraction site. It is the nearest camp in the summit through the Babadak ranger station to the summit route. Camp II is safer to stay/camp because of the presence of waiting shed to shield trekkers/hikers from heavy rainfall, and it is also near to a water source.

**Table 26. Most popular tourist attraction sites/facilities for the visitors.**

ATTRACTION SITE/FACILITY	VISITOR			REASONS
	RANK	FREQ.	PERCENTAGE (%)	
Summit	1	49	100	<ul style="list-style-type: none"> <li>- A place where to view best the sunrise and sunset</li> <li>- Second highest elevation in the country</li> <li>- A place that every visitor in the PA want to reach</li> <li>- A place where you can see neighboring provinces/municipalities</li> </ul>
Camp Site II	2	16	33	<ul style="list-style-type: none"> <li>- With waiting shed</li> <li>- It is the nearest camp to the summit using the easy trail</li> <li>- Camp II is near water source</li> <li>Safer to stay than camp III</li> </ul>
PA Office	3	13	27	<ul style="list-style-type: none"> <li>- It is where briefing is conducted</li> <li>- Free water and good comfort rooms, bedrooms</li> <li>- Souvenir buying station</li> <li>- Good lodging house</li> </ul>
Ranger Station	4	11	23	<ul style="list-style-type: none"> <li>- Cooking and resting area with fire place</li> <li>- Starting point for hiking for the easy way (Babadak – summit)</li> <li>- Relatively warmer to stay/rest</li> <li>- Stations for tour guides/Park Rangers</li> </ul>
Waiting shed/Camp I	5	5	10	<ul style="list-style-type: none"> <li>- Nearest camp site from ranger station</li> <li>- Resting shed when traveling</li> </ul>

Camp III	<b>5</b>	5	10	- Very wide camp - Nearest camp in the summit (using the killer trail)
Akiki Trail	<b>6</b>	4	8	- Trekking for the experts - You can see the different vegetation from pine ecosystem to mossy forest and grassland areas - Most Challenging trail
Relay Station	<b>7</b>	3	6	- Easier to trek than the summit - It is near the summit - Alternate site to view best the sunrise and sunset
Ambulalakaw Lake	<b>8</b>	2	4	- Beautiful Lake - Judged as the cleanest inland body in the region -Beautiful lake surrounded with mossy forest

The PA office ranked 3<sup>rd</sup> by 27% of the visitors. This office is where coordination/transaction of business regarding the PA visit is usually conducted. It is where briefings of visitors, PAMB meetings/seminars/workshops are conducted, and buying station for souvenirs.

The Babadak Ranger Station building that includes the Community Environment and Natural Resources (CENRO) building ranks fourth most popular to the 23% visitor respondent. The ranger station is where the visitors stay/sleep before going up to the summit when using the easy trail (PA Office – summit route). It is warmer because of the presence of fire place and has lodging rooms.

The Camp I with waiting shed is ranked 5<sup>th</sup> for 10% of the visitors' preference. When traversing the Babadak - summit trail, waiting shed in camp I is one of the identified resting area where part of the summit can be viewed. Camp I is the nearest camp in the ranger station. This camp is situated within the lush mossy forest of the Park. Camp III is also ranked 5<sup>th</sup> by the respondent visitors. Camp III is the nearest camp to the summit when traversing the Akiki killer trail.

The most dangerous trail or the Akiki killer trail is 6<sup>th</sup> popular attraction to the 8% visitor respondents. This trail is recommended only for expert trekkers. It is the most challenging trail since it takes about 2-3 days hike to reach the Mt. Pulag summit. The jump-off is in the Municipality of Kabayan. The beautiful scenery of the landscape can be viewed along the stretch of the Akiki trail, from pine ecosystem to mossy forest to the grassland areas.

The relay station which is the alternative site to view the sunset and sunrise is ranked 7<sup>th</sup>. This station is easier to trek than the summit and is also near to the summit.

The adjudged cleanest inland body in the Region, the Ambulalakaw Lake is ranked 8<sup>th</sup> by the visitors (4%). The Ambulalakaw Lake is a beautiful lake surrounded by lush mossy forest.



## **E.7 CARRYING CAPACITY OF SOME ATTRACTION SITES**

Based from the result of analyses of interview to the respondents and using the STATISTICA 4, carrying capacities of some attraction sites within the park were computed (Table 27).

### **a. Briefing area in the Protected Area Office**

#### **a.1. Limiting factors**

**a.1.1. Rainy months (LF3)** – Considering that the municipality of Bokod is under climatic type II of the Coronas rainfall classification, rainfall is one of the limiting factors identified. Rainfall hampers the continuous visit of tourists in the area. It was computed that there are 123 days or four rainy months in 365 days or a year that is from June – September that affects the trip or visit of the visitors to the park/PA office.

## **a.2 Average Size Requirement**

The average size requirement for a visitor to be comfortable during briefing is  $1\text{m}^2$  which is the same with the average standard area of a visitor to view the displayed items/souvenirs. The requirement ranged from  $0.5\text{ m}^2$  to  $1.5\text{ m}^2$ . The average number of hours to stay in the PA office is 1 hour.

## **a.3. CARCAP Computation and Mathematical Model**

From the various data generated and preceding computations, the following carrying capacity values are derived:

**a.3.1. The Carrying Capacity (CC) of the briefing area is 70 visitors computed as follows:**

Effective total size of the briefing area

$$\text{CC} = \frac{\text{Effective total size of the briefing area}}{\text{Standard area occupied by a visitor}}$$

$70\text{ sq m}$

$$\text{CC} = \frac{70\text{ sq m}}{1\text{ sq m}}$$

$$\text{CC} = 70\text{ visitors}$$

**a.3.2. The Potential Carrying Capacity (PCC)** is 560 visitors.

PCC = CC multiply by rotation coefficient (RC)

where:

Effective Total number of hour area is open for briefing

$$RC = \frac{\text{Effective Total number of hour area is open for briefing}}{\text{Average number of hours of visit}}$$

8 hours

$$RC = \frac{8}{1 \text{ hour}} = 8$$

PCC = 70 visitors x 8

PCC = 560 visitors per day

**a.3.3. With regard to the Real Carrying Capacity (RCC), the computed carrying capacity is 558 visitors per day.**

$$RCC = PCC \times \frac{100 - \underline{123}}{100}$$

$$RCC = 560 \times (0.9966302)$$

$$RCC = 558 \text{ visitors}$$

MODEL is:

**RCC = 560 (PCC) [0.9966302(LF<sub>1</sub>)]**

The computed CC and PCC of the briefing area are the same with 560 visitors while the RCC is 558 visitors. Briefing can be done from 8:00 -12:00 in .the morning and 1:00-5:00 in the afternoon.

## **b. Ranger Station and CENRO building**

### **b.1. Limiting factor**

There is only one limiting factor identified that affects the carrying capacity of the ranger station. This is the rainy months from June – September with 123 rainy days.

### **b.2. Average Stay of Visitors and Size Requirement**

On the average, the standard size or space required by the visitors to stay for lodging is 2 sq. meters. The visitors should be in the station at least 6 PM up to 2:00 AM in the following morning to have a good rest. Starting 2:00 AM, visitors will start to walk to the summit.

## **b. 3. CARCAP Computation and Mathematical Model**

For the ranger station, the following carrying capacity values are derived:

**b.3.1 The Carrying Capacity (CC) of the ranger station is 42 visitors taking into consideration the total area of the lodging rooms (84 sq. meters) and the standard area requirement of the visitors. Details of the computation are as follows:**

Total area of the lodging rooms

$$CC = \frac{\text{Total area of the lodging rooms}}{\text{Standard size requirement per visitor}}$$

84 sq m

$$CC = \frac{84 \text{ sq m}}{2 \text{ sq m}}$$

$$CC = 42 \text{ visitors}$$

**b.3.2 The Potential Carrying Capacity (PCC)** is computed at 42 visitors as shown below:

PCC = CC multiply by rotation coefficient (RC)  
where:

$$RC = \frac{\text{Total number of hour ranger station is open}}{\text{Average number of hours in the ranger station}}$$

$$RC = \frac{24 \text{ hours}}{24 \text{ hours}} = 1$$

$$PCC = 42 \text{ visitors} \times 1$$

$$PCC = 42 \text{ Visitors}$$

**b.3.3. The Real Carrying Capacity (RCC) is 42 visitors.**

$$RCC = PCC \times \frac{100 - \underline{123}}{100}$$

$$RCC = 42 (0.9966302)$$

$$RCC = 41.85 \text{ or } 42 \text{ visitors}$$

MODEL is:

$$\mathbf{RCC = 42(PCC) [0.9966302(LF_1)]}$$

Based from the computations, the CC, PCC and RCC in both lodging rooms

of the Ranger Station and CENRO building are the same with 42 visitors. These numbers of the visitors can be accommodated by both CENRO and Ranger Station comfortably.

## b. Camp II

### d.1. Limiting factors

There are three (3) identified limiting factors in the camp. This include **rainfall for four months (Lf1)**, **limited numbers of waiting shed (Lf2)** and **comfort rooms/pits for men and women (LF3)**. With one (1) existing waiting shed, additional of one (1) should be constructed and two (2) additional pits for men and women should be dug.

### e.2. Average Stay of Visitors and Size Requirement

No rotation coefficient is observed in the area considering that camping is only done ones. From the camp, visitors should at least start to walk about 3:15 AM to reach the summit to witness the beautiful sunrise which start about 4:45 AM. The summit is about 1.5 hours walk from the camp or 1.7 kilometers. The average standard area occupied by a visitor is 3.75 sq. meters.

### e. 3. CARCAP Computation and Mathematical Model

The following carrying capacity values were derived:

**b.3.1** The Carrying Capacity (CC) of camp II is 443 visitors. Details of the computation are as follows:

$$\begin{aligned} CC &= \frac{\text{Total area of camp}}{\text{Standard size requirement per visitor}} \\ &= \frac{1,659 \text{ sq m}}{3.75 \text{ sq m}} \\ CC &= 443 \text{ visitors} \end{aligned}$$

e.3.2 The Potential Carrying Capacity (PCC) is computed at 443 visitors as shown below:

$$\text{PCC} = \text{CC} \text{ multiply by rotation coefficient (RC)}$$

where:

Total number of hours camp II is open

$$\text{RC} = \frac{\text{Average number of hours in the camp}}{24 \text{ hours}}$$

$$\text{RC} = \frac{24 \text{ hours}}{24 \text{ hours}} = 1$$

$$\text{PCC} = 443 \text{ users} \times 1$$

$$\text{PCC} = 443 \text{ Visitors}$$

e.3.3. The Real Carrying Capacity (RCC) is 437 visitors.

$$\text{RCC} = \text{PCC} \times \frac{100 - \frac{123}{100}}{100} \times \frac{100 - \frac{1}{2}}{100} \times \frac{100 - \frac{2}{4}}{100}$$

$$\text{RCC} = 443 (0.9966302) (0.995) (0.995)$$

$$\text{RCC} = 437 \text{ visitors}$$

MODEL is:

$$\text{RCC} = 443 (\text{PCC}) [0.9966302(\text{LF}_1) (0.955(\text{LF}_2) (0.955 (\text{LF}_3))]$$

Camp II has a CC and PCC of 443 campers with a computed RCC of 437. The visitors who camp in the area are expected to have been briefed early in the Protected Area Office and were able to reach the camp before sunset.

## f. Summit for Sunrise Viewing

### f.1. Limiting factors

Rainfall for four months (**LF1**) was only the limiting factor that was identified that limits the visit of tourist to the summit. The total area of the summit is 95 sq. meters. Within the summit, a total of about 10 sq. meters is occupied by about 1 meter height of dwarf bamboos (*Yushabia niitakayamensis* Hayata Keng F.) that couldn't be occupied when viewing in the summit. Thus, the summit has only an effective area for viewing of 85 m<sup>2</sup>.



Other observation that limits the stay of the viewers includes the windy and extremely cold condition in the area, poor visibility due to blanketing of clouds in the summit which starts about 9:00 AM especially during wet season. Likewise, the soil and vegetation degradation is a problem.

### f.2. Average Stay of Visitors and Size Requirement

The average stay of the visitor in the summit to view the sunrise and other stunning scenes in the area is 2 hours. Viewers are comfortable with the standard area occupied of 1.11 sq. meters.

### **f.3. CARCAP Computation and Mathematical Model**

The following carrying capacity values for summit for viewing were derived:

**f.3.1 The Carrying Capacity (CC) of the summit is 77 visitors/viewers.**  
Details of the computation are as follows:

Total effective area of summit for viewing

CC = -----

Standard size requirement per visitor

85 sq m

CC = -----

1.11 sq m

CC = 77 visitors

**f.3.2 The Potential Carrying Capacity (PCC) is computed at 77 visitors as shown below:**

PCC = CC multiply by rotation coefficient (RC)

where:

Total number of hours area is open

RC = -----

Average number of hours stay in the summit

2 hours

RC = ----- = 1

2 hours

PCC = 77 visitors/viewers x 1

PCC = 77 Visitors/viewers

### f.3.3. The Real Carrying Capacity (RCC) is 77 visitors

$$\begin{array}{r} 100 - \underline{123} \\ \hline 100 \\ \text{RCC} = \text{PCC} \times \frac{\text{-----}}{100} \end{array}$$

$$\begin{aligned} \text{RCC} &= 77 (0.9966302) \\ \text{RCC} &= 76.74 \text{ or } 77 \text{ visitors} \end{aligned}$$

MODEL is:

**RCC = 77 CC) [0.9966302]**

The area of summit is very small that has the same CC, PCC and RCC of 77 viewers. The area cannot accommodate larger number of visitors, thus alternate site for viewing which is in relay station should be resorted to.

## g. Camp III

Camp III is the widest camp in the park with an area of 2,406 sq. meters or 0.2406 ha. It is the nearest camp in the summit that is can be hiked for only about 30 minutes.

### g.1. Limiting factors

Like in Camp II, rainfall (**LF1**), lack of pits for men and women (**LF2**), and lack of waiting shed (**LF3**) were the identified as a limiting factor that limits camping of tourist in the camp. To date, no waiting shed is constructed in the



camp which is very important to be provided for all the stakeholders or trekkers using or passing through the camp.

### **g.2. Average Stay of Visitors and Size Requirement**

No rotation coefficient in camping areas. The average stay of the visitor in the camp using tents is 10 hours that starts from 6:00 pm to 4:00 AM. From 4:00 am, trekkers should start to walk to summit for sunrise viewing. The average standard area occupied by the campers is 3.75 sq. meters.

### **g. 3. CARCAP Computation and Mathematical Model**

The following carrying capacity values were derived:

**g.3.1 The Carrying Capacity (CC) of camp III is 642 visitors.** Details of the computation are as follows:

$$CC = \frac{\text{Total area of camp}}{\text{Standard size requirement per visitor}}$$

$$CC = \frac{2406 \text{ sq m}}{3.75 \text{ sq m}}$$

$$CC = 642 \text{ visitors}$$

**g.3.2 The Potential Carrying Capacity (PCC) computed is 642 visitors** as shown below:

$$\text{PCC} = \text{CC} \text{ multiply by rotation coefficient (RC)}$$

where:

Total number of hours camp II is open

$$\text{RC} = \frac{\text{Total number of hours camp II is open}}{\text{Average number of hours in the camp}}$$

24 hours

$$\text{RC} = \frac{24 \text{ hours}}{24 \text{ hours}} = 1$$

$$\text{PCC} = 642 \text{ campers} \times 1$$

$$\text{PCC} = 642 \text{ campers/visitors}$$

**g.3.3. The Real Carrying Capacity (RCC) is 638 visitors**

$$\text{RCC} = \text{PCC} \times \frac{100 - \underline{123}}{100} \times \frac{100 - \underline{1}}{3} \times \frac{100 - \underline{0}}{1}$$

$$\text{RCC} = 642 (0.9966302) (0.996667) (1)$$

$$\text{RCC} = 637.70 \text{ or } 638 \text{ visitors}$$

MODEL is:

$$\text{RCC} = 642 (\text{PCC}) [0.9966302(\text{LF}_1) (0.996667) (1 (\text{LF}_3))]$$

Based from computation, the CC and PCC have 642 campers with PCC of 638 campers daily. With the computed carrying capacity, the great number of visitors cannot be accommodated by the summit should the visitors will flock the summit at the same time. Likewise, the foot trails leading to the site will be compacted.

The summary result of carrying capacity computation expressed per annum and the mathematical model computation are presented in tables 27 and 28, respectively. The basis in computing the carrying capacity on per annum is 8 months/year which are the observed usual visit of hikers. The 4 months which are rainy months were assumed that there are no tourists/visitors to the park.

**Table 27. Summary result of computed carrying capacity some of the different attraction sites.**

TOURIST ATTRACTION SITE	CARRYING CAPACITY					
	CC		PCC		RCC	
	PER DAY	PER ANNUM	PER DAY	PER ANNUM	PER DAY	PER ANNUM
Briefing area in PA Office	70	16,940	560	135,520	558	135,036
Ranger station	42	10,164	42	10,164	42	10,164
Camp II	443	107,206	443	107,206	437	105,754
Camp III	642	155,364	642	155,354	638	154,396
Summit for Viewing	77	18,634	77	18,634	77	18,634

Based from computations, the briefing area in the PA office can accommodate 16,940 visitors per year with a real carrying capacity of 135,036 visitors per year. However, interview from the Park Superintendent revelead that not all visitors briefed will climb the park. The Babadak Ranger station and the CENRO building have a total carrying capacity of 42 visitors with a computed total number of visitors that can be accommodated per annum of 10,164. Likewise, with only one identified limiting factor of 4 rainy months, the computed real carrying capacity of the station is the same (10,164 per annum)

Camp II which is usually used as camping area using the Babadak-summit trail can accommodate 107,206 visitors per year and with a RCC of 105,754 visitors per year. For camp III, the computed CC and PCC are the same of 642 per day and with 155,354 visitors per annum while the computed RCC with three limiting factors (4 months rainfall, lack of waiting shed and pits for men and women) had 638 visitors per day and 154,396 visitors per year. The summit which is the ultimate goal of the visitors to reach can hold viewers up to a number of 18,634 per annum.

The computed carrying capacity of the different facilities in the park per annum is very high compared to the average number of tourists visited the park for 10 years. It connotes that the visitors of the MPNP is within the carrying capacity of the different ecotourism sites/facilities in the park. However, with the average number of visitors of 2,936 per year, environmental problems in the park already exist which include waste generation, soil compaction and degradation of vegetation along trails. These problems can be aggravated further when bigger number of visitors will visit the park in the future which definitely affects the sustainability of the park as ecotourism area and as a watershed.

The carrying capacity of Camp I was not computed considering that this is not being used by campers. However, the identified problems by the visitors and community members include the lack of pit for men and women and the absence of walls of the existing waiting shed should be addressed. On the other hand, Carrying Capacity of the trek was not included in the computation. However, the average standard distance (2 meters) between trekkers was identified based from the results of the interview and the total length of the Babadak-Summit trail (17.30 kilometers). The expected carrying capacity of the trail which is more than 8,000 visitors per day is unlikely to happen.

**Table 28. Mathematical Model of the different attraction sites**

ATTRACTION SITES	MATHEMATICAL MODEL
Briefing Area in PA Office	RCC = 560 (PCC) [0.9966302(LF <sub>1</sub> )]
Ranger Station and CENRO Building	RCC = 42(PCC) [0.9966302(LF <sub>1</sub> )]
Camp II	RCC = 443 ( PCC) [0.9966302(LF <sub>1</sub> ) (0.955(LF2) (0.955 (LF3
Camp III	RCC = 642 ( PCC) [0.9966302(LF <sub>1</sub> ) (0.996667) (1 (LF3)
Summit	RCC = 77 CC) [0.9966302]

## **F. PROBLEMS ENCOUNTERED BY THE VISITORS IN THE PROTECTED AREA**

The different problems encountered by the respondent visitors were noted including the possible solutions. Observations showed that most of the problems encountered are related to the development/protection and management of Mount Pulag National Park. One of the common problems encountered which were also observed by community members interviewed and PA managers is the very poor condition of the road starting from the PA office to Babadak Ranger Station. This is very dangerous to traveling tourist and to anybody especially during rainy season. Another common problem is the expansion of cultivated areas which creates eye soar to the visitors. This should be stopped to prevent the destruction of the forested areas.

Visitors observed problems on facilities in almost all the attraction sites. A bigger TV screen during briefing is needed especially when bigger numbers of visitors come to the office. Likewise, the video tapes used by PA managers should be about the Mt. Pulag National Park to augment information about trekking in protected areas. The present conditions of the building in ranger station usually used as lodging area are not comfortable for use because the building drips during heavy rainfall. Repair of these said buildings should be immediately done. The inadequate number of pits for men and women in camps I, II and III are also mentioned as problems to the visitors. Provision of sidewalls of waiting sheds in camps I and II is also a concern of the visitors in addition to the construction of at least one shed in camp III.. Regarding the protection and management of the park against forest fires, kaingin making, minor forest product utilization/collection, additional park rangers should be hired to augment the existing man power manning the whole 11,500 Mt. Pulag National Park.

**Table 29. Problems encountered by the respondent visitors, community and PA managers**

<b>Problems</b>	<b>Solutions</b>
Poor condition of the PAO – Babadak road	Repair/cement the road for easy transportation
Pictures/videos used in the briefing	The video should feature the PA
Parking space in PAO	Additional parking space in PAO should be provided
Poor condition of ranger station and CENRO building	Dripping buildings during heavy rainfall should be repaired
Instill discipline and importance in preserving the mountain	Strictly implement existing laws in the PA
Expansion of vegetable gardens that destroy the forest vegetation	Government do something to stop expansion of gardens
Insufficient number of park rangers	Employ additional park rangers for the protection of the PA
Lack of waiting sheds and pits in camp sites	Construct waiting shed in camp III, dig additional pits for men and women in camp sites I, II, III
Condition of the waiting sheds	Put up walls of waiting sheds in camps I and II

#### **G. INTEGRATION OF CARRYING CAPACITY COMPUTATION IN RELATION TO MANAGEMENT AND COMMUNITY PERSPECTIVE**

The result of carrying capacity computation plays an important role for the Mount Pulag National Park management. The computed carrying capacity, potential and real carrying capacities are essential bases in decision-making towards effective management of the different attractions sites for the sustainable ecotourism in the park. Example is the observation on the result of carrying capacity computation for the summit which is lower than the carrying capacities of camps II and III. This connotes that the summit area cannot contain all the visitors that can be accommodated by camps II and III. Thus, the management should look into how the campers can still view the sunrise without sacrificing the satisfaction of the visitors. Perhaps,

alternative site should be offered where sunrise can also be viewed like in the relay station. Likewise, the *by-batch* scheme should be adopted/practiced to minimize further the compaction of the soil and degradation of the vegetation along the trails. While other visitors are waiting for their turn, environmental programs or activities could be introduced by the management to entertain them. The participation of community members to entertain visitors can also be resorted to by presenting cultural dance or other activities that can amuse them. Tour guides may also offer some attraction sites that can be explored while visitors are still in the camp.

The problems identified or the limiting factors that affect the comfort of the visitors in using the different attraction sites/facilities could be prioritized for development for a sustained ecotourism management of the Protected Area. These ecotourism developments will entice more local and foreign tourists to come to the park. Thus, this opens more opportunities to the community members living within and adjacent to the park, the local government units, businessmen and other stakeholders for social and economic development.

## H. SUMMARY AND CONCLUSION

From the foregoing discussions, it can be surmised and concluded that:

1. The Mount Pulag National Park covers a very vast area and offers many attraction sites/facilities and activities that entice tourists locally and internationally to visit in the area;
2. The Mount Pulag National Park is a watershed that feeds water into two major river systems in the province of Benguet and Nueva Vizcaya. As a watershed, it also supplies the water needs of the many communities and stakeholders for domestic and industrial uses, irrigation and hydroelectric power production in Luzon;
3. The Mount Pulag is vegetatively covered with three prominent vegetation zones; the pine forest covering an area of 2,047 hectares, mossy forest (5,822 has) and grassland areas (804 has);

4. Trekking in Mt. Pulag could be done through four (4) different routes (Babadak Ranger Station to summit route; Akiki Trail; Tinoc summit trail which via Tawangan and Lusod; and Bayombong, Nueva Vizcaya to summit trail) to reach the summit. There are challenging trails suited for expert trekkers and for beginners. Fees paid for porters have also different charges;
5. There are enough numbers of tour guides (more than 70) to assist visitors coming in the park;
6. The average visitors in Mt. Pulag National Park for 10 years and 1<sup>st</sup> quarter of 2008 was 2,396 composed of 1,444 and 954 males and females, respectively. For foreign visitors, the average was 24 composed of 17 males and 7 females;
7. The compositions of the respondents interviewed were: community members (35 respondents), visitors (49 respondents) and Protected Area managers (14 respondents). The community respondents live in different barangays covered by the national park with ages ranging from 15-68 years old who are all farmers with additional source of income in tour guiding and vending. The interviewed visitors came from different places and affiliated to different organizations. Fourteen percent (14%) are government employees and others were employed in private companies, businessmen and self employed/students. The interviewed PA managers mostly came from the PAWCZMS, CENRO personnel and a representative from Protected Area Management Board (PAMB).
8. Visitors in Mount Pulag usually come in groups as revealed by 100% of the respondents. They come in group with members of 10 and below (29%), 11-20 (24%), 21-30 (33%), 31-50 (8%) and 61-80 (4%).
9. Visitors come to the park for several reasons. Thirty nine percent (39%) said it is for adventure/recreation, educational tour/field trip (22%), tourism (14%), curiosity (10%), nature viewing and to feel the coldness of the peak (8%).
10. The first three (3) most popular and preferred attraction sites by the visitors are: Summit (100%), Camp site II (33%) and PA Office (27%).
11. Responses from the visitors showed that seventy five percent (75%) have plans to comeback to visit the park. As regards willingness to pay, 100% are willing to pay the fees imposed by the park management. From the 75%, 14% are willing to

pay extra for environmental fees (entrance/lodging, green fee) ranging from P50 – 300, 61% are willing to pay the same fees collected and 12% have no answer if how much they want to pay.

12. Some of the visitors' identified problems/limitations on the use of the different attraction sites in the park were classified as limiting factors that affects the carrying capacity of these facilities. Others affect the comfort on the users.
13. The carrying capacity (per day) of the Babadak Ranger Station (lodging rooms) (42 visitors), Camp II (443 campers), Camp III (642 campers), and Summit for viewing (77 viewers). The numbers of visitors that can be accommodated by the different attraction sites/facilities are bases in decision-making to enhance the management of the park.
14. With the number of expected visitors that can use the different facilities in the park, the summit can not possibly accommodate them based from the computed carrying capacity of the site. Offering alternative site for viewing the sunrise is likely to be done and *by-batch* scheme could be adopted when the number of visitors are more than the computed carrying capacity of the summit;
15. The identified problems that affect visitors comfort and satisfaction are: the size of the briefing area, display room and size of the TV screen when briefing is done; poor condition of the PA office to Babadak road; condition of the CENRO and ranger station in Babadak that drips during heavy rainfall; no sidewalls of the existing waiting sheds; additional waiting sheds in camps I and II and construction of new shed in camp III; poor conditions of pits for men and women in the camping sites; and limited area of summit for viewing. These can be addressed by the management in collaboration with the community members, LGUs and other stakeholders in order to attract more visitors to the park.
16. The increase in the number of visitors will give opportunities to the community, LGU, businessmen based in the vicinities of the park for social and economic development.
17. The critical environment parameters that affect significantly the sustainable management of the park are the expansion of gardens within the park, soil compaction and vegetation degradation, bio-prospecting or illegal collection of

plants, solid waste generation, forest fire occurrence and timber poaching. The issuance of several Land Tenure Instruments (LTI) such as CADC, CALC, tax declarations and other instruments also complicates the management of the park.

18. Other significant findings of the study relate to: (a) There are common problems identified by the three sets of respondents that needs immediate action/solutions; (b) The need to hire additional park rangers to man the 11,500 hectare national park; (c) willingness to come back and pay for environmental protection; (d) some community members want additional farm lots to cultivate which is a threat to the protection of the park; (e) Soil and vegetation degradation in the trails particularly in grassland areas. These affect the ecotourism services offered by the park.

## **RECOMMENDATIONS**

In the management of Mount Pulag National Park (MPNP), strategies should be designed to establish sustained tourism activities and to ensure the sustainability of management of natural resources in the park, the following recommendations are hereby forwarded:

### ***Protected Area Office***

The problems/limiting factors identified based from the result of interview to three (3) of respondents (community, visitors, PA managers) should be addressed. To address these limitations, the following are being recommended:

- A bigger TV screen should be used during the conduct of briefing and the video tapes to be used should feature the Mt. Pulag National Park vis-à-vis foreign scenes with background on environment songs;
- Additional area/space should be located as additional parking area for visitors/clients. The possible site is within the Benguet State University Bokod Extension compound which should be negotiated with the management of the school.
- Water harvesting should be done in the PA office during rainy season for use during the dry season. Thus, water tank should be installed to ensure availability of water always.

### ***PA Office to Babadak Road***

The rugged condition of the road affects every visitor/stakeholder who wants to visit the park. The present condition of the road is very dangerous especially during rainy months. The development of the road should however be agreed upon by the PA management group, community and other stakeholders managing the park. Perhaps, on the side of the management, the development (cementing) of the road will enhance the mobility of the officers who are protecting the park. On the other hand, there is a fear that the road improvement will trigger the entry of land speculators or encroachment in the park which will complicate the protection of the park against squatting, forest conversion to agricultural areas/kaingin making, forest product harvesting, and other destruction activities. This favors the community and visitors in terms of accessibility and mobilization/transportation of agricultural products especially the farmers. Thus, public consultation regarding the road improvement should be undertaken. Should development of the road is agreed upon by the concerned parties, sourcing out of funds should be done.

### ***Babadak Ranger Station***

The poor condition of the ranger station and CENRO buildings should be immediately addressed for the comfort of the users/visitors. The number one problem is the dripping of the building during heavy rainfall. Re-painting of the roofing, replacement of broken windows especially in the lodging rooms, and other necessary repairs should be undertaken. To finance the repair of the buildings, a percentage on the amount collected as lodging fees should be allocated for the purpose.

### ***For Camp I***

To enhance the comfort on the use of camp I and the waiting shed as a resting area, the following should be undertaken:

- Put up sidewalls of the waiting shed to protect the users during the heavy rainfall and strong winds;
- Construct at least 1 additional waiting shed to accommodate greater number of

- visitors especially when community members from Barangays Tawangan and Lusod will rest in the camp at the same time
- with other travelers/visitors
- Dig at least 1 pit each for both sexes with coverings (side walls, rooftops) near the camp away from water ways.

### ***Camp II***

Being the most used camp in the park, the following are recommended:

- Provide side walls of the shed especially that the shed also is being used by park rangers as a lodging when patrolling the park.
- Additional one shed should also be constructed with side walls.
- Dig at least 1 pit each for both sexes with coverings (side walls, rooftops) near the camp away from water ways.
- The degraded vegetation in the flat area of the camp should be planted to grasses during the rainy months when minimal or no visitors are camping in the area. When grasses have recovered, they will serve as carpet to campers which will enhance their comfort in using the camp.

### ***Summit***

The summit is the objective of every visitor to reach. The comfort of some visitors however is being sacrificed when they are great in numbers more than 77 visitors because of limited size of the summit. Thus, alternate site where viewing of sunrise should be offered to visitors like the tower relay station. The peak which is devoid of vegetation should be planted to grasses during rainy months to enhance the landscape of the summit.

### ***Tower Relay Station***

The relay station is an alternative best site for viewing the sunrise and sunset. Based from interview of the respondents, provision of shed and pits were the problems raised in the area. However, the park management should look into it but they should see to it that

construction and digging of pit in the site will not negatively affect the relay station area.

### ***Camp III***

The following suggestions/recommendations to enhance the comfort of the visitors to camp in the area are:

- Construct at least 1 waiting shed as shield to campers or stakeholders passing in the area during thunderstorms. The shed should also have side walls;
- Dig at least 2 additional pits each for men and women away from water ways/source. These pits should also have walls and roof tops durable enough to withstand typhoons, strong winds and rains.

### ***Ambulalakaw Lake***

This lake is one of the ecotourism areas in the park with no facilities. If possible, a shed and comfort rooms/pits for men and women should be provided in the area for the comfort of the visitors. Likewise, the protection of the mossy forest near the lake should be intensified. It is suggested/recommended that additional park rangers should be hired to enhance the protection of the lake and other resources within the park.

### ***Mt. Tabayok***

A shed should be constructed in the area for the protection of every visitor. Pits for both sexes should also be provided for the trekkers.

### ***Grassland Areas***

The grassland area is threatened to some environmental problems and the following recommendations are suggested:

- Protection of the grassland area against grass fires during summer months. Thus, forest fire brigades should be formed compose of DENR employees, community

members, tour guides and other stakeholders. Fire fighting tools should always be available for use by the fire brigades for immediate suppression of any fire occurrence within the park

- Soil compaction and vegetation degradation in the grassland areas are noticeable in the trails. The management should maintain only designated trails going to the summit. No parallel trails should be established by the trekkers/hikers. There are portions where the trails look like canals due to compaction, if possible, stones should be filled-up to lessen soil compaction and degradation of vegetations near the designated trails. Trails should be maintained regularly.

### ***Forest areas***

The environmental issues concerning forest lands shall be dealt accordingly to avert the destruction of the vegetative cover of the park. The following are being recommended/suggested:

- The conversion of forest lands to agricultural lands which are initiated by doing first kaingin in the area by the land claimants should be stopped. If possible, setting of boundaries and releasing of some areas in the parks as A & D to perfect the land claims should be undertaken to limit the activities of the community for agricultural purposes in this areas. This is very important because conflicts usually arise where boundaries are not defined. Review of all existing policies related to the management of the protected area and use of the resources in the park should also be done to determine gaps that need immediate attention for policy decision-making/formulation.
- If possible, survey and mapping of existing cultivated areas should be undertaken. Any expansion to be done by the cultivators should be dealt accordingly.



- The PAMB should be strengthened due to its multi-sectoral composition in finding ways to sustainably manage the park.
- There should be strict implementation of bio-prospecting law (E.O. 247) to prevent illegal collection of plants in the park.
- Putting up of check points in every entry points in the park should be undertaken. This would at least help thwart timber poaching, bio-prospecting and other illegal activities in the area.

### ***Socio-economic concerns***

To address the socio-economic problems in the area, the following are recommended:

- Provide alternative livelihood to communities heavily dependent on the resources of the protected area.
- Provide environment-friendly livelihood trainings to the communities.
- Development of agroforestry farms in suitable cultivated areas should be undertaken to enhance the environment condition of the area and provide more income to cultivators/farmer communities.
- Encourage the adoption of the Sloping Agricultural Land Technology (SALT) in the cultivation of the farms to enhance the beauty of the landscape for Soil and Water Conservation (SWC) and to entice more visitors to come in the park.
- Employ some community members as Park Rangers to effectively protect the area and to provide additional income for their families.

### ***Over-all Management recommendations***

1. Strict enforcement of existing laws and policies relative to the Protected Area Management, wildlife protection and bio-prospecting.
2. Development of an effective information system that caters to the information needs of all stakeholders should be prepared. The information education campaign activities should be undertaken by LGUs, DENR and other entities.
3. Establishment of management zones for every land-use in the park. Zone

management strategies should be applied to ensure the protection and management of the park while compatible land use practices that cater the socio-economic needs of the community shall be realized.

4. Strengthen the conduct of research and development in support to the PA development and management of the PA.
5. Continue the monitoring and evaluation of biodiversity in the PA for effective biodiversity conservation.
6. Implementation of the General Management Plan of the Mount Pulag National Park which caters the effective management of the park for the socio-economic and environment development of the Protected Area;
7. Intensify forest protection activities in the park. Additional number of Park Rangers should be hired.
8. In visiting Mount Pulag National Park, all visitors should coordinate or register first to the Protected Area Office at Ambangeg, Bokod, Benguet including the different Local Government Units, Schools and other stakeholders for proper accounting on the number of visitors relative to the Carrying Capacity of the park.

## **PROBLEMS MET**

1. The interview schedule is very long and interviewees especially the visitors are very hard to come within reach of because they are rushing and/or tired;
2. The interview schedules were changed/modified several times that affected the flow of the study implementation;

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Annex 1. Limitations identified by the PA Managers, Community respondents and Visitors on the use of some attraction sites in Mt. Pulag

ATTRACTION SITES	LIMITATIONS	PA MANAGERS		COMMUNITY		VISITORS	
		F	%	F	%	F	%
PA Office/ Visitor's Center	Lack of water during summer	0	0	3	9	3	6
	Need wider parking area	0	0	4	12	3	6
	Limited souvenirs	0	0	2	6	1	2
	Small TV used in briefing	0	0	0	0	1	2
	Inadequate shelves for displays	0	0	0	0	1	2
	Limited kiosk	0	0	0	0	1	2
	Limited area of briefing area	0	0	0	0	2	4
	Number of lodging room	0	0	0	0	3	6
	Number of CRs/BRs	0	0	0	0	1	2
	Combination of any of the above	4	29	4	11	23	47
	All of the above	10	71	6	17	10	20
	No limitations	0	0	9	26	0	0
	No answer	0	0	11	31	0	0
Babadak Ranger Station	Limited space/accommodation	0	0	0	0	1	2
	Limited cooking space/table	0	0	0	0	1	2
	Building drip during heavy rainfall	2	14	0	0	2	4
	Combination of any of the above	8	58	3	9	28	57
	All of the above	4	28	17	48	10	20
	Additional Camping and guiding fee	0	0	0	0	5	10
	No answer	0	0	15	43	2	4
Camp site I	Number of waiting shed	0	0	5	14	8	16
	Size of waiting shed	0	0	0	0	1	2
	Water availability	0	0	2	6	1	2
	Number of comfort rooms	0	0	3	9	3	6
	Condition of waiting shed	0	0	1	3	3	6
	Combination of any of the above	0	0	16	45	15	31
	All of the above	14	100	8	23	18	37
Camp Site II	Small Size of the Camping area	1	7	0	0	6	12
	Insufficient Number of pit for women	1	7	5	14	3	6
	Uncomfortable condition of pit for women	1	7	2	6	3	6
	Insufficient number of pit for men	1	7	3	9	2	4
	Uncomfortable condition of pit for men	1	7	0	0	2	4
	Insufficient number of waiting shed	2	14	6	17	3	6
	Dilapidated condition of waiting	0	0	3	9	1	2

	shed						
	Combination of any of the above	5	37	15	43	8	16
	All of the above	2	14	1	3	21	43
Camp Site III	Insufficient Number of pits	0	0	2	6	2	4
	Absence of waiting shed	0	0	7	20	6	12
	No separate pit for men and women	0	0	5	14	4	8
	Extremely cold	0	0	1	3	1	2
	Absence of picnic tables	0	0	0	0	1	2
	Lack of water during summer	0	0	3	9	2	4
	Combination of any of the above	0	0	11	31	2	4
	All of the above	14	100	7	20	5	10
	No answer	0	0	0	0	26	53
Tower/Relation Station	Absence of Comfort room	0	0	0	0	5	10
	Absence of shed/shelter	0	0	0	0	6	12
	Poor visibility	0	0	0	0	3	6
	Extremely cold	0	0	0	0	2	4
	Combination of any of the above	14	100	0	0	14	29
	All of the above	0	0	35	100	16	33
	No answer	0	0	0	0	3	6
Summit	Limited space	0	0	0	0	3	6
	Extremely cold	0	0	3	14	2	4
	Soil and vegetation degradation	0	0	5	14	1	2
	Prevailing wind condition	0	0	5	14	2	4
	Spectacular view can be seen before dawn and before noon	0	0	0	0	3	6
	Poor visibility	0	0	5	14	7	14
	Combination of any of the above	0	0	6	17	12	25
	All of the above	14	100	11	31	15	31
	No answer	0	0	0	0	4	8
Mt. Tabayok	Absence of shed	0	0	3	9	1	2
	Absence of pit	0	0	1	3	1	2
	Extremely cold	0	0	0	0	2	4
	Combination of any of the two	9	64	9	26	5	10
	All of the above	2	14	14	40	10	20
	No answer	3	21	8	23	30	61
Ambulalakaw Lake	No facilities like shed, CR	0	0	6	17	1	2
	No picnic tables	0	0	2	6	2	4
	Extremely cold	0	0	0	0	5	10
	Forest destruction near the lake	0	0	2	6		
	Combination of any of the two	10	72	8	23	6	12
	All of the above	2	14	17	49	7	14
No answer	No answer	0	0	0	0	28	57

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