The Essence of Ecotourism: An Environmental Study to the Application of Carrying Capacity in Mt. Gulugud Baboy in Batangas

Kimberly Claire Bautista, Joshua Juan, Leah Ellaine Valenzuela Enrico Garcia

ABSTRACT

Overcrowding is one of the most unresolved issues in the tourism industry specifically in natural attractions. It is described as a destinations where hosts or guest locals or visitors feel that there are too many visitors and that the quality of life in the area or the quality of the experience has deteriorated unacceptably. Therefore, having carrying capacity as a form of sustainability can reduce overcrowding in different natural attractions. The purpose of this study is to identify the carrying capacity, the standard total daily visits and the quantified tour guides' perceptions, experiences and observations, as a basis for adding guidelines in local environmental protection policy. By computing carrying capacity and standard total daily visit, it can monitor and control the number of tourist arrival per day in the mountain since it became popular at a short time. The carrying capacity for the climbing area of the mountain was estimated using "Boullon's" formula. Both the upper and lower limits were used and results showed that tourists in the climbing area should not exceed 150 persons while visitors of the place should not exceed 600 persons for it to be considered not overcrowded. Perceptions of 34 guides were also collected during surveys to quantify experiences and observations. Tour guides which also local residents want additional policies, specifically on solid waste management, segregation, and some infrastructure to support the needs of both the tourists and the locals. It is recommended that the local environmental protection policy should be revisit and implemented before the next peak season.

Keywords: *carrying capacity, standard total daily visit, environmental policy, Mt. Gulugod Baboy, local tourism*

INTRODUCTION

Tourism is to visit spectacular places. It heavily relies on natural resources and culture of the destination. As a result, preservation of the environment and cultural heritage is one of the main topics of tourism development in the present age. In tourism it is common to have a distinction between the physical environment and socio-cultural environment working with one another. Today, tourism is often viewed as a powerful engine of growth and development for several local government units; however, the number of tourists a destination receives dramatically impacts on the environmental, social, and cultural resources of the area. In particular, tourism is based on a complex relationship with the surrounding environment, which is affected by tourists' inflows. Because of this timely problem, much emphasis should be placed on the need to identify the carrying capacity of a tourist destination, and that is the maximum number of tourists a destination can accommodate. One great example will be Mt. Pulag. One of the foremost adventure destinations in Northern Luzon, Philippines. Mount Pulag is in many Filipino and international mountain climbers' must-do list or bucket list. Mount Pulag is the highest peak in Luzon, the third highest in the Philippines. But today, Mt. Pulag is bursting at the seams due to the influx of climbers that brought problems in its carrying capacity. So recently on January 2018, Office of Civil Defense Cordillera (OCD-CAR) information officer Ivy Carasi said the park management has issued an order indefinitely suspending all activities due to forest fire. Based on an initial investigation, the fire started when a butane gas stove brought by a hiker allegedly exploded that lead to temporarily close the mountain for at least 6 months.

According to Bhakti Chougule (2011), tourism is the important industry which ecotourism is growing at a very fast rate. It has been stated "tourism destroys tourism." There are certain negative impacts because of the commercialization which is gradually destroying the environmental resources on which we are dependent. The concept of ecotourism fulfills both the requirements-tourism development and environmental protection. Carrying capacity is an essential tool to protect ecological aspects, rich biodiversity, and rare species, dense forest in an area specializes in soft adventure, cultural and natural experiences. Carrying capacity management includes environmental, economic, social indicators as well

as managing visitor's satisfaction and impacts, even if certain challenges considered when measured perfectly, carrying capacity can be very useful in environmental management practices. According to Carl Cater (2015), ecotourism is widely recognized and promoted as a sustainable form of nature-based tourism, often with cultural components. Such attention has commanded a great deal of academic work, use by development practitioners, and a United Nations designated 'year of ecotourism' in 2002. However, it is clear that ecotourism has not always been able to deliver on its promises. This is often a result of misinterpretation of what ecotourism means in different contexts and cultures, and its links to broader tourism and development objectives.

As stated by Regina Butarbutar (2013), the ecotourism is global issues who most talked lately in Indonesia, it is one of the activities special tourist interest which low impacts on natural tourism. The presence of ecotourism in the era of sustainable and tourism development mission should be minimum negative impacts, both on the environment resources and on socio-cultural local values. Ecotourism activities were more oriented on the utilization of natural resources, the natural ecosystems and have not been polluted yet. However, when all of tourism development cannot be separated from the negative impacts, such as ecosystem distress in ecotourism object when visited by large number of tourists, there are many conflicts of interest between the ecotourism management with local communities, especially regarding the benefits sharing and its accessibilities. The purpose of this paper is to identify the environmental impacts arising as a result of ecotourism activities and to find out alternative efforts in mitigating the environmental impact of ecotourism activities. Carrying capacity of ecotourism is not just limited to the number of visits, but also covers other aspects, such as: (1) ecological capacity that is ability of natural environment in providing the needs of tourists, (2) physical capacity, that is ability of facilities and infrastructure in providing the needs of tourists, (3) social capacity, that is ability to absorb tourism activities without the negative impacts on the local communities, (4) the economic capacity, that is ability to absorb destination commercial efforts and accommodate any interests of the local economy. According to Pipin Noviati Sadikin (2017), Mount Rinjani National Park (MRNP) in West Nusa Tenggara, Indonesia has applied ecotourism which becomes more popular

at international and national level. Yet, the MRNP ecotourism faces various problems such as ecotourism resources damage, erosion, or garbage left by ecotourism activities, etc. This study aims to analyze (i) the land suitability for ecotourism based on criteria of tourism object range, land use and land cover, zone type, biodiversity range, and slope, and (ii) carrying capacity of the ecotourism area, the total number of visitors who can enjoy ecotourism attraction based on activities type, total area, capacity days, and turnover factor. The results of the land suitability for ecotourism analysis show that the MRNP ecotourism has been applied on the suitable land for ecotourism, except in Pelawangan Senaru and at the Peak of Mount Rinjani due to its sensitive and fragile area.

Gulugod-Baboy means “pig’s spine”, so named because of the contours of the hills. “Gulod”, however, means hill; “pig’s hill” can also depict the pastoral scene of the mountain. You would normal encounter cows, goats, and in the past, pigs, as you trek through the mountain. Mt. Gulugod-Baboy is the general term that describes the hills that traverse Calumpan Peninsula in Mabini, Batangas. Located in Southern Batangas, the peninsula is more known for the diving resorts of Anilao – the birthplace of Philippine scuba diving. Since dive enthusiasts are also enthusiasts for anything ‘outdoor’, they began exploring the hills, and soon, Gulugod Baboy became a hiking destination on its right, although today it remains a popular side-trip to a diving escapade to Anilao, or to the nearby Sombrero or Maricaban islands. At its peaks, you can see, from east to west: Janao Bay, Maricaban strait which bears Sombrero and Maricaban islands, a distant, faint blue Mindoro, Verde Island (SW) and Batangas Bay. The city and port of Batangas is visible on the east, and behind and beside them, the mountains of Lobo, the nearest one being Mt. Pinamucan (E). To the northeast is Mt. Maculot, and even Mt. Batulao and the Tagaytay highlands (NW). Assessing the carrying capacity of Mt. Gulugod Baboy can be very useful to the municipality which creates the environmental policy for the early preservation and conservation of the mountain and the wildlife living there. The number of tourists that can be accommodated and the experience, as well as observation of each, should be the foundation as to what and what's not to be executed on the policy.

Figure 1. Conceptual Framework

The conceptual framework presented in Figure 1 shows the integration of some important local environmental policy guidelines namely: carrying capacity that identifies how many persons are capable to limit maximum space use; standard total daily visit that set limitations in a certain place to achieved quality movement; quantified tour guides' experiences and observations to evaluate existing local environmental policy and guidelines.

Objectives of the Study

The purpose of this study is mainly to add some important local environmental policy guidelines based on the following specific objectives: (1) identify the carrying capacity of Mt. Gulugod Baboy, (2) identify the total optimal number of visitors in Mt. Gulugod Baboy, and (3) determine the perceived sustainability measures of tourist guides in Mt. Gulugod Baboy.

METHODOLOGY

The study is a quantitative type of research and was conducted in Mabini, Batangas on April 27, 2018. Data were gathered using checklists answered by the tour guides. This contains information whether they experience problems in Mt. Gulugod Baboy as well as their perception of the needs at the site. Primary data were obtained by conducting interview with the tourism officials of the municipality of Mabini. This will include information such as the frequency of tourist arrival, its existing environmental policy resolution, facts about Mt. Gulugod Baboy and their plans for the succeeding months.

Carrying capacity and total daily visit of the water falls was computed using the formula of "Boullon" (1985). The formula is widely used to identify the tourism carrying capacity and standard total daily visit.

Carrying Capacity = area used by tourists/average individual standard

Rotation Coefficient = no. of daily hours area is open to tourist/average time of visit Total

Daily Visit = carrying capacity x rotation coefficient

RESULTS AND DISCUSSION

Carrying Capacity of Mt. Gulugod Baboy

The average daily carrying capacity of Mt. Gulugod Baboy was computed using "Boullon's formula". The computed value will assess using the standard in the Visitor Carrying Capacity Guidelines used by the Florida Department of Environmental Protection, Division of Recreation and Parks. It requires 50-200 square feet or 4.65-18.58 square meters (as converted) per mountaineer only.

Table 1. Computed Daily Carrying Capacity for Mt. Gulugod Baboy

Area Requirement Limits	Area Used by Tourists (Mt. Gulugod	Average Individual Standards	Carrying Capacity

	Baboy)		
Lower Limit	700 sqm	4.65 sqm	150.54
Upper Limit	700 sqm	18.58 sqm	37.67

Table 1 presents the average carrying capacity of Mt. Gulugod Baboy. The area limit guided by the standard was set to 4.65 sqm as for the lower limit and 18.58 sqm for the higher limit. The area that encompasses Mt. Gulugod Baboy is approximately 700 square meters (estimated). Using the lower limit the computed carrying capacity is 150.54, individuals that will enjoy the 4.65 sqm limit as indicated by carrying capacity standard. Moreover, the upper limit value of 37.67 individuals will enjoy a standard space of 18.58 sqm.

According to Coccosis (2017), controlling tourism growth becomes a central policy issue in this context bringing forward the issue of tourist carrying capacity or 'how much tourism can be acceptable' in a tourist destination.

Standard total daily visit for Mt. Gulugod Baboy

The Carrying Capacity which will be computed as the area used by tourists divided by the average individual standard is needed in finding the standard total daily visit. Another variable is the rotation coefficient which is the number of daily hours the area is open to tourist divided by the average time of visit. Hence, the total daily visit is the carrying capacity multiply by rotation coefficient.

Table 2. Computed Total Daily Visit for Mt. Gulugod Baboy

Area Requirement Limits	Rotation Coefficient (3-hr stay)	Rotation Coefficient (12-hr stay)	Total Daily Visit (3-hr stay)	Total Daily Visit (12-hr stay)
Lower Limit	4	1	602.16	150.54
Upper Limit	4	1	150.68	37.67

If we use the lower limit, which is 4.65 sqm, the carrying capacity will be 150.54 and the total daily visit will be ranging from 150-602

tourists, if they stay for 3-12 hours. However, using the upper limit which is 18.58 sqm, the carrying capacity and the total daily visit will be lowered to and range from 37 and 37-150, if they stayed for 3-12 hours

Using the data from the Upper Limits' Total Daily Visits, the Mt. Gulugod Baboy exceeds more than three times of the computed standard total daily visits, giving an average visitors of 500 daily during peak seasons. Results indicate that the carrying capacity is not observed, if the visitors will come in Mt. Gulugod Baboy and stay there for more than 3 hours.

Catton Hui (2015) defines carrying capacity as the maximum persistently supportable load of a focal population in a bounded environment. Here, definitions of carrying capacity for natural populations, ecosystems and humans, as well as biocapacity, are presented, with issues fully discussed pertaining to their proper interpretation, models and estimation, debate and derived paradoxes.

Table 3. Frequency of Tourist Visit in Relation to Carrying Capacity (Estimated)

3-Hour Stay Interval	Frequency of Tourists' Visit (Peak Season)	Carrying Capacity (Based on Computed 150 per climber)
05:00-08:00	223	Not Observed
08:01-11:00	144	Observed
11:01-14:00	83	Observed
14:01-17:00	50	Observed
Total	500	

Results shows that in the 3-hour stay interval, only 05:00-08:00 period was not observed the carrying capacity and it indicates that this is the peak hours to visit the mountain. Tourists' still enjoy the breathtaking view of the mountain in other time intervals, given that they stay only for 3 hours. Local tourists' officials mentioned that they want to set cut-offs per

intervals during peak seasons or even weekends but the tourists' insist to stay more than 3 hours. The results of this study will give them an idea on how to include cut-off time in the local environmental protection policy and to formalize the idea that visitors understands and follow when it is included in the policy guideline.

According to Harry Coccosis (2017), controlling tourism growth becomes a central policy issue in this context bringing forward the issue of tourist carrying capacity or 'how much tourism can be acceptable' in a tourist destination. Tourism Carrying Capacity Assessment (TCAA), with the aim to identify and impose limits, can be valuable in planning for sustainable tourism.

Perceived sustainability measures of tourist guides in Mt. Gulugod Baboy

In quantifying the sustainability measures of tourist guides in Mt. Gulogud Baboy, the researchers used a modified environmental sustainability questionnaire. In consideration of the frequency of tourists' visit presented on table 3, the researchers conducted a survey during weekend between opening and closing of the mountain for visitors.

Table 3. Perceived sustainability measures of tourist guides in Mt. Gulugod Baboy

Indicators	Weighted Mean	Interpretation
Cleanliness is monitored at the site.	3.70	Strongly Agree
The authority provides signage's on the site for hiker's safety.	3.57	Strongly Agree
No visible damages on the mountain.	3.50	Strongly Agree
Proper waste segregation and garbage disposal are practiced.	3.60	Strongly Agree

I think climate change is not affecting the growth of trees in the mountain	3.70	Strongly Agree
We are not tolerating the cutting of trees in the area.	3.53	Strongly Agree
The peacefulness of the place is still preserved.	3.80	Strongly Agree
I think climate change doesn't affect goods and services provided by the mountains	3.77	Strongly Agree
Being a tour guide is one of the sources of income of some residents in Mabini Batangas.	3.60	Strongly Agree
The mountain is providing source of income to some residents living nearby the mountain.	3.43	Strongly Agree
I am providing services needed by the tourists in Mt. Gulugod Baboy.	3.60	Strongly Agree
The tourists are approachable.	3.60	Strongly
The tourists are not affecting our culture and traditions	3.83	Strongly Agree
Our way of living is not affected by the tourists.	3.67	Strongly Agree
I encourage tourists to maintain and sustain the area.	3.77	Strongly Agree

4= Strongly Agree; 3= Agree; 2=Disagree; 1= Strongly Disagree

Majority of the tour guides' disagreed on experiencing overcrowding, thus the carrying capacity of Mt. Gulugud Baboy shows that there are some given times that overcrowding were experireinced. The peacefulness is still observed at the mountain. Still, tour guides agreed on monitoring the cleanliness of the sites to lessen polluted area. Although, the locals and tourist guides are cleaning the area, that wasn't enough to control the disposal materials of the tourists.

Results also generated a weighted mean of 3.60, strongly agree, for providing a good services for the tourists by the locals and tour guides. They are encouraging the tourists to maintain and sustain the area. Majority of the tour guides and locals strongly agree that they are not tolerating the tourists to cut any trees. As summarized, tour guides' suggested some additional environmental protection policy based on what they observed (1) improve signage's on the sites, (2) banning of smoking and drinking alcoholic beverages, (3) fine for cutting any trees, (4) provide more garbage cans in every peak.

According to Newsome (2010), travel to and appreciation of natural landscapes and geological phenomena continues to grow as a niche area of tourism. Despite economic recessions, political problems, the increasing price of oil and even the risk of natural disasters, such as volcanic eruptions, people still yearn for new experiences and need to fulfill that deep aspect humanity, which is having a sense of wonder about the planet we live on. It is our belief that geotourism will continue to rise as an important tourism activity as our planet becomes increasingly overcrowded, as wild places continue to be diminished and people strive for sustainable lifestyles and authentic natural experiences.

CONCLUSION AND RECOMMENDATION

The computed carrying capacity of Mt. Gulugod Baboy was 150.54 for the lower limit of 4.65 sqm and 37.67 for the upper limit of 18.58 sqm per climber. For the lower limit, the standard total daily visit will be ranging from, 150-602, while for the upper limit will be ranging from 37-150 both if the tourists' stay for 3-12 hours in Mt. Gulugod Baboy. In the 3-hour stay interval, only 05:00-08:00 in the morning period exceeds carrying capacity with a frequency of 223 tourist visits. Majority of the tour guides' strongly agreed that they are monitoring the cleanliness of the sites. Tour guides' also encourage tourists to maintain and sustain the beauty and cleanliness of the area. They strongly agree that Mt. Gulugod Baboy is somehow a provider in source of income to the residents living nearby area.

The study recommends reviewing the environmental policy guidelines to add cut-off per three-hour interval from opening to closing of the mountain using the carrying capacity of 150 tourists' per batch. Regulate the 37-150 maximum visitors to maintain the standard total daily

visit. For the tourists', it is recommended that they avoid the peak hours 05:00-08:00 in the morning intervals, during peak season, to minimize tourists' arrivals and achieved the standard total daily visit. Provision of trash bins, the practice of solid waste management for both tourists' and local guides, and review of the existing local environmental protection policy guidelines are also recommended.

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