

The Sustainable Taman Nasional Gunung Gede Pangrango Ecotourism Policy Scheme

Haswan Yunaz¹, Joella van Donkersgoed², Reny Andriyanty³ and Iswahyu Pranawukir⁴

Abstract

The environmental damage of Taman Nasional Gunung Gede Pangrango (TNGGP) is triggered by visitors or the local community, it can threaten the sustainability of the ecotourism area and disrupt the stability of the ecological are functions. The solving of existing problems is the forming of sustainable ecotourism development policy, that it can preserve and preserve the ecotourism area of TNGGP. This study method was descriptive. The research was analyzed by Analytic Hierarchy Process. AHP is one of the tools to formulate the priorities policies among many intangible factors. The needed ecotourism policy ware TNGGP area conservation, increasing the role of the local community around TNGGP and the enhancing unique ecological experiences for visitors policy. The ecotourism policies must apply based on priority of TNGGP ecosystem protection and preservation, protection of vulnerable ecosystems, activities to improve community welfare around TNGGP, protection of unique and endangered species, providing environmental education to visitors and local community around the TNGPP, management's efforts towards TNGGP entry rates, fostering TNGGP staff to improve services for visitors, and unique ecotourism experience activities and environmental awareness raising for all stakeholders in TNGGP.

Keywords: TNGGP Ecotourism, Enviroment, Sustainable Policy

INTRODUCTION

The National Park as one of nature conservation areas is expected to remain intact in a sustainable because it has its own uniqueness, such as its original ecosystem (Mondino & Beery, 2018), AdrianaTisca, Istrat, Dumitrescu, & Cornu (2016), Kahvec, Ok, & Yilmaz (2012) Yilmaz (2011) and Waylen, McGowan, & Milner-Gulland (2009). It must be managed with a zoning system that can be used for research, science, education, cultivation, tourism and recreation purposes (Khoshtaria & Chachava, 2017a). The National Park is a forest area that is still remaining and is expected to be relatively maintained among Indonesia's forest areas that have begun to become extinct. The reality reflect many national park areas has increasingly ecosystem functions and the structure of the area damaged (McClure et al. (2018), Grimes, Bouchair, & Tebbouche (2017) and Waylen et al. (2009). Its utilization also are not optimal for the social and economic welfare of the community in each region as happened in 7 (seven) bioregions in Indonesia (Sugandy, 2007).

One of the main national parks in Indonesia is Gunung Gede Pangrango National Park. Gunung Gede Pangrango National Park (TNGGP) is one of the five oldest conservation areas in Indonesia and is the last bastion of biodiversity and tropical forest ecosystems of the islandof Java. This area is one of the ecotourism destinations that has a wealth of flora and fauna that is abundant and it can be used as a representation of the problems faced by all national parks in Indonesia. Nearly 50% of the bird species on Java are in this area. There are more than 250 species of birds in this region that rare. TNGGP is also unique as a habitat for Javan Gibbon, a tailed monkey that is rare and protected animal since 1931. Its population is only 10% of the world's population. Based on the development data of priority species threatened with extinction in TNGGP in 2016, the following data are obtained:

¹ Economic Faculty of Kosgoro 1957 Business and Informatics Institute Jakarta, Indonesia, Email: haswan.yunaz@ibi-k57.ac.id

² Cultural Heritage and Preservation Rutgers University-New Brunswick, Email: j.van.donkersgoed@rutgers.edu

³ Economic Faculty of Kosgoro 1957 Business and Informatics Institute Jakarta, Indonesia, Email: r.andriyanty@gmail.com

⁴ Faculty of Social Science and Political Science, Kosgoro 1957 Business and Informatics Institute Jakarta, Indonesia, Email: prana1enator@gmail.com

Table 1. The data of Development of Endangered Priority Species in Site Monitor, year 2015 till 2016.

No.	Species	Year	
		2015	2016
1.	Owa Jawa (<i>Hylobates Moloch</i>)	102	98
2.	Elang Jawa (<i>Nizaetus Bartelsi</i>)	6	17
3.	Macan Tutul (<i>Panthera Pardus Melas</i>)	2	3

Source: TNGGP, 2017.

The all various advantages possessed that TNGPP have, it faces various problems that can threaten its sustainability, especially in relation to the increasing flow of tourist arrivals. Based on the following graph, there is a tendency to increase the number of visits to TNGGP.

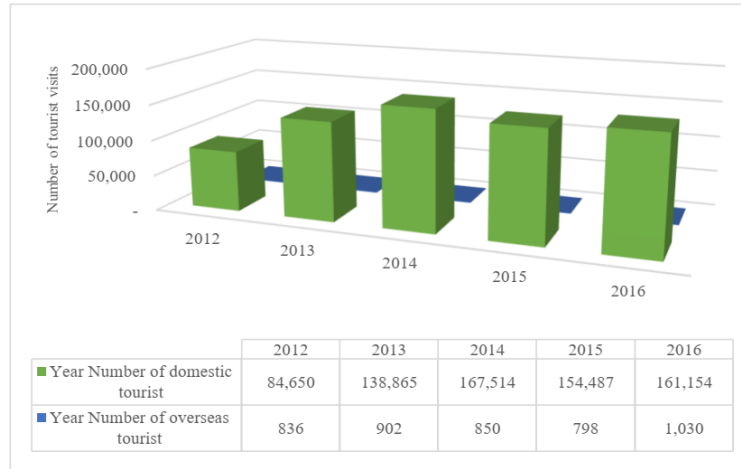


Figure 1. Graph of the number of visitors to TNGPP development year 2012-2016. Source: TNGGP (2017).

Source: TNGGP (2017).

The Increasing the number of visitor has consequences. One of the main consequences is ecosystem destruction activities (Che & Holden, 2008). The high disruption to the ecotourism area in TNGPP is a fairly serious problem with the sustainability of the region. Based on the research of Yunaz (2000), among behaviors that damage the environment are vandalism and deprivation of fauna activities around TNGPP. Around it, there are many ecotourism facilities which are damaged by being scribbled by visitors such as directions to Puncak Gede and Pangrango Peak. It shown in the following picture:



Figure 2. TNGGP conditions due to the ignorance visitors about the environment

In that study, it was also seen that on average there were 50 percent of visitors wishing to bring the original of TNGPP’s flora and fauna. That behavior is very contrary to the behavior of an ecotourist who must preserve the environment. This condition also indicates that the understanding of the environment among visitors is not correct. That circumstances must be anticipated. The necessary effort is encouraging and educating all visitors

about the importance of the presence of germplasm in TNGGP. The complete behavior of visitors' vandalism towards the environment, especially the treatment of flora and fauna is presented in the following table:

Table 2. The Desire to Take the Originaly TNGGP's Flora and Fauna.

The desire to take of originaly TNGGP's flora and fauna	Number	
	respondents	%
Carry it	30	50
Not carry	30	50
Total	60	100

All above conditions, enforce to formulate the best pattern of sustainable ecotourism development. The expansion of ecotourism also brings negatif impact for enviroment, tourism attractiveness and social cultural local values. The enviroment impact can also be formed from changes in initial values (Andriyanty, 2024). In case it is uncontrolled, it induce pollution and enviroment damage (Butarbutar & Soemarno, 2013). The ecotourism must focus on management objectives local characteristics, without changing the rural community. It must prevent the ecosytem damage, where it guarantees the availability of sustainable organisms, water and air (Tojeiro, 2011).

The sustainable ecotourism management must consider the conservation and ensure the enviroment quality as a top priority (Hidayah, Rosyid, & Armono, 2016). In the fact, the ecotourism is very exposed on damage, especially the rare species (Bentz, Dearden, & Calado, 2013) also declared by Petit and Prudent (2008) and Mimura et al. (2007). Vandalism activities will certainly cause damage to TNGGP. This long term environmental damage will threaten the sustainability of the ecotourism area and disrupt the stability of the ecological functions of the region. For this reason, we need a form of sustainable ecotourism development policy pattern that is expected to solve various existing problems so that it can preserve the TNGGP ecotourism area and it can continue to be enjoyed by next generations. By sustainable ecotourism mechanism can promote the conservation enthusiasm and also socio-economic development (Mona, El-Naggat, El-Gayar, Masood, & Mohamed (2019), Tang & Chen (2017), Song & Kuwahara (2016), Augustine & Dolinting (2016) and Schloegel (2007).

RESEARCH METHOD

This study method was descriptive. The research was analyzed by Analytic Hierarchy Process. AHP is one of the tools to formulate policies among many factors that are intangible, all factors are considered important but are relatively based on different interests and determining the priorities quandary. That circumstance requires a relative prioriras determination in decision making (Saaty, 2008). Decision theory is the process of selecting the right path, through the application of knowledge, artistic techniques, and skills. It also utilizes the experience to learn various alternatives to solve problems identified through the strategies provided (Janssen, Käsmann, Rudat, & Rades, 2016). This Analytical Hierarchy Process can be applied to solve measurable (quantitative) problems and those that require judgment. The use of opinions in solving problems is done by comparing input in pairs (pairwise comparison). For that we need a measuring scale that can distinguish each opinion and has regularity, thus facilitating the transformation of opinions in the form of numbers (scale value). The level of validity of an opinion depends on the consistency and accuracy of the opinion (Saaty, 2008).

The policy analysis of the TNGGP development is indispensable in the development of the demand for the Pangrango Mountain National Park area as an ecotourism area. This analytical approach considers the various benefits expected in sustainable ecotourism development (Bunruamkaew & Murayama, 2011). In this reseach the analysis of the sustainable development of TNGGP ecotourism policies focuses on three main things, namely conservation, increasing community participation around TNGGP and enhancing unique ecological experiences for visitors. Conservation policy will concern the consideration of sustainable ecotourism because of the high vandalism in the TNGGP environment. The zoning determination for agricultural, ecotourism zones and protected area, or land using status recognition must take into consideration of planning, conservation and biodiversity and forest restoration (Khoshtaria & Chachava, 2017b). The insistence for

national authorities to accelerate endangered species protection including international collaboration through policy mechanism (McClure et al., 2018). The promotion of conservation action may further increase the demand of ecotourism (Zimmerhackel et al., 2018). The Bahamas as the largest salvage shark as ecotourism in the world, challenges the main management conservation measures that have been carried out by the government for the past 25 years. The long coastline ban in the 1990s has preserved this important ecological resource for the shark diving industry. Furthermore, the supervision supported by the establishment of shark sanctuaries in 2011 will have a positive effect on divers who will return in the future (Haas, Fedler, & Brooks, 2017).

The second focus is the development of increasing the community participation around the TNGGP which will have a major impact on the protection of rare and unique flora and fauna exploitation activities by both visitors and local communities. The conservation awareness must be collaborated between rural community and government. The community active participation must be developed because they have the biggest share of it (Yilmaz, 2011). The development of community-based ecotourism can keep and conserve all environment. Combined, these endeavors have supported a sustainable village environment improvement (Fatimah, 2018). The development of integrative participatory community-based ecotourism in Sangkhom District has succeeded united the mutual stakeholder with their difference and also increase their participation in ecotourism development planning. In line with planning, the process must integrate nasional policy with local government planning to start community based sustainable Sangkhom district ecotourism (Auesriwong, Nilnoppakun, & Paraweck, 2015). There are many aspects of community dependence on ecotourism cause uncertainty between tourism and environmental protection. The ecotourism is main resource but still having trouble in comunal participatory of the Puerto Princesa Subterranean River National Park (Jalani, 2012). Local awareness and their interest in environmental conservation tend to be low. In addition, hunting and conflicts of interest between local residents, and underdeveloped infrastructure (transportation, roads, etc.) are major weaknesses in development of ecotourism (Paresashvili, 2014).

The third focus is on enhancing unique ecological experiences for visitors. This is important considering the increasing of visitor satisfaction. The increasing number of visitor will increase the TNGGP revenue. It can be allocated to invest in TNGGP conservation. There are many global ecotourism, experiencing a decline in investment in natural asset maintenance (Adamu, Yacob, Radam, Hashim, & Adam, 2015). Tourism activities must be redefined in terms, ways and fields and renewal of this field in the tourism market (AdrianaTisca et al., 2016). The ecotourism information is very potential, which is used to make purchasing decisions among the vistors, to support the green market, animal welfare and conservation advantages (Moorhouse, D'Cruze, & Macdonald, 2017).

Based on the matter above, the hierarchical structure developed in this study leads to the ecotourism development policy based on conservation areas. The stages of analysis determine policy priorities with the AHP method are as follows:

1. Preparation of the TNGGP development policy model. The preparation of policy models is intended to simplify the complexity of management problems. And then it can be analyzed systematically. This model is structured by making a hierarchical structure of problems consisting of 3 levels as shown in Figure 3. Determination of the relative importance of the elements of the model.
2. Determination of the relative importance of elements of the policy model is determined through pairwise comparison. At each level of the hierarchy, a group of experts who are experts in sustainable ecotourism are asked to compare the relative importance of one element to another with reference to the level of the hierarchy above.

Table 2. The Scale of Measurement of the level of importance of Alternative policies for development of TNGGP ecotourism demand.

Intensity of Interest	The definition
1	Both elements are compared equally important.
3	One element is slightly more important than the other elements.
5	One element is very important compared to other elements.
7	One element is clearly more important than the other elements.
9	One absolute element is more important than other elements.
2,4,6,8	The values between two contiguous considerations.
reverse	If for activity <i>i</i> get one number when compared with activity <i>j</i> , then <i>j</i> has the opposite value compared to <i>i</i> .

Source: Saaty (2008).

The expert group gives value 1 if the policy element *i* is equal to *j*, the expert group gives numbers 3, 5, 7, 9 if judging the policy element *i* is a little more important, very important, clearly more important and absolutely more important than the policy element *j*. And the expert group will assess 2,4,6 and 8 if they feel the policy elements *i* and *j* have almost the same level of importance. For the opposite, if the element *i* is given a value of 3, the policy element *j* will be 1/3 which means that the element *j* is a little more important than the element *i*. And the same as if *i* is worth 4,5,6,7,8,9, then the value of *j* will be 1/4, 1/5, 1/6, 1/7, 1/8 and 1/9 with the opposite meaning too. In this case, benchmarking is done using the measurement scale as listed in table 6. To get the final result as the main priority weight of the policies taken, the assessment results are calculated using Expert Choice software.

RESULT AND DISCUSSION

The AHP analysis performe the Pairwise comparison value with the main criteria with respect to the goal with a consistency index value of 0.021 showing the results of the hierarchy of principles, criteria and alternative policies for sustainable ecotourism development in TNGGP according to the following table.

Table 3. The importance of the principle of sustainable ecotourism development.

Principle	weight of interest *)
Conservation area	0,4815
Increasing of community participation around TNGGP	0,2627
The improving unique ecological experience for Visitors	0,2558

From the results of expert evaluations shown in Table 3, it can be seen that the first hierarchy of the principle of sustainable ecotourism development is conservation of the area (0.4815) and followed by the increasing the participation of communities around TNGGP (0.2627) and visitor's unique experience (0, 2558). That means, however the development of sustainable ecotourism conservation of the area is the main principle that needs attention. To support the realization of the principles and criteria for sustainable ecotourism development by utilizing the potential of TNGGP in each element of S-T Strategy, various alternative policies are needed with the following descriptions:

1. Conservation actions for the management of the TNGGP area ecosystem. One of the keys to the success of conservation of natural areas, especially for an ecotourism area, is the ability of management to manage the ecosystem of the area in such a way especially in fragile ecosystem areas and unique/rare species that need to be protected strictly. As a management role, managerial skills are needed which are supported by the ability of qualified human resources in accordance with their respective fields. This is supported by (Barichiev et al. (2018), Cortés-Avizanda, Martín-López, Ceballos, & Pereira (2018), Harstad (2016) and

Abdullah, Mamat, Yaacob, Radam, & Fui (2015). Many of the natural conservation areas that were previously good ecosystems are now seriously damaged, such as Gunung Leuser National Park in Nangroe Aceh Darussalam, Tanjung Puting National Park in Kalimantan. There are four important elements in managing ecotourism ecosystems, namely: 1) Compilation of management master plans; 2) Organizing regional management institutional structures; 3) Implementation of a master plan for managing ecotourism areas consistently and consequently; 4) Supervision of all ecotourism activities and 5) Conservation actions for the TNGGP area ecosystem management.

2. The increasing the role of the community around TNGGP intend to empowering the local communities proportionally and professionally. It is absolutely necessary because all local communities are the main fortress for national parks security (Sangha, Russell-Smith, & Costanza (2019), Muttaqin, Alviya, Lugina, Hamdani, & Indartik (2019), Sangchumnong (2018), Auesriwong et al. (2015), and Nicula & Spânu (2014). It prevents damage from various forms of extinct flora and fauna disturbances and illegal land clearing. It must be considered that local communities can also be a major threat to the existence of the national park because if the welfare level of community is low, and then the community will intervene in the TNGGP. The forming of policy are expected to stimulate the local community welfare, it will increase the awareness of the environment that is getting higher.

3. The improving unique ecological experience for Visitors.

The ecotourism management particularly play an important role for TNGGP visitor experience ((Ma, Chow, Cheung, & Liu (2018), Wahid, Aliman, Hashim, & Harudin (2016), Teo, Khan, & Rahim, (2014) and Kamri & Radam, (2013). Many studies reflect that the more visitors, the higher the ecosystem damage more unpredictable (Platon, Frone, & Constantinescu (2015), Nor, Corstanje, Harris, Grafius, & Siriwardena, (2017), Flaherty, Turk, & Anderson (2019), Kariminia, Ahmad, & Hashim (2013). The management of ecotourism visitors is an absolute requirement to ensure the sustainability of ecotourism because the behavior of good enders will provide a good atmosphere for the integrity of the ecotourism area (Bagis et al., 2024). This policy will be in line with sustainable ecotourism development obligate the good level of service proportionally and professionally. The services to visitors become an important attention. On the main principle of the ecotourists that they look for something unique and directly see the natural beauty with its ecological process. The willingness to pay among visitors will increase if they get the tremendous unique natural beauty experience. The services must be oriented to the total quality management 9000.

Graphically the analysis in this study can be seen in the following figure:

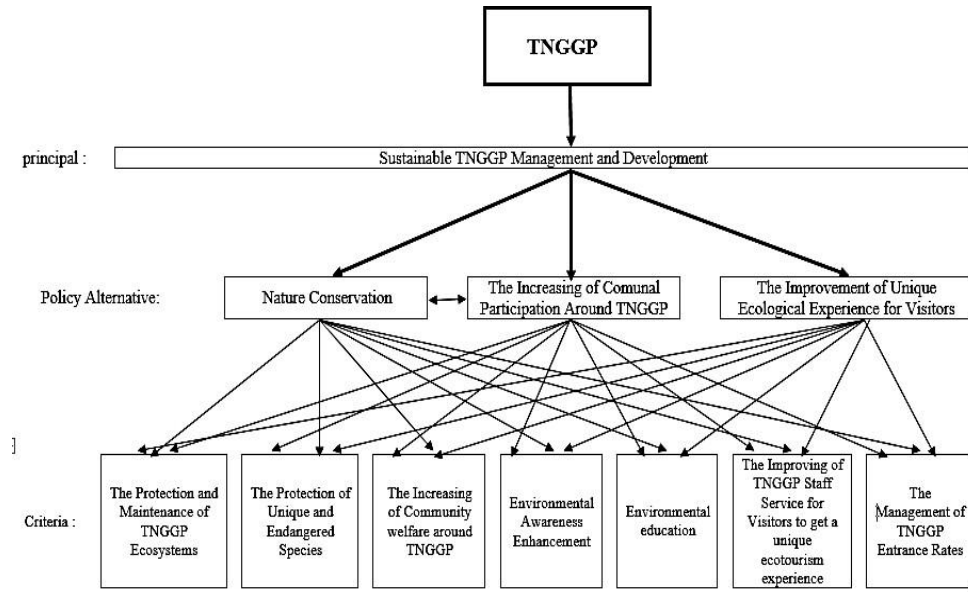


Figure 3. Policy hierarchy for the development of TNGGP.

Second hierarchy from the results of expert assessments shown in Table 4 below. It can be seen that the main criteria for sustainable ecotourism development, that need to be considered are the protection and maintenance of fragile TNGGP ecosystems, the enhancement of local community welfare activities around TNGGP, the protection of unique and endangered species, then providing the environmental education to visitors and surrounding residents in TNGGP, TNGGP entry rate management, the development and enrichment of service quality of TNGGP staffs and environmental awareness enhancements for all TNGGP stakeholders.

Table 4. The level of importance of sustainable conservation ecotourism criteria.

Criteria	Importance weight	Rank
Protection and Maintenance of TNGGP Ecosystems	0,356	1
The increasing of local community around TNGGP welfare	0,344	2
The protection of unique and endangered species	0,151	3
The environmental education	0,085	4
The management of TNGGP entrance rates	0,044	5
The development of TNGGP staff to Improve their services	0,015	6
The environmental awareness enhancement	0,005	7

The design of sustainable ecotourism development is a relational hierarchy between related elements in the implementation of ecotourism. If it applied and supported by consistently and consequently policies can ensure a sustainable ecotourism area. That meaning that ecotourism area can be perceived by present and future generations. To arrange the relationship between related elements in the design of sustainable ecotourism development, a policy hierarchy needs to be established. There are three principles and seven criteria that underlie the development of sustainable TNGGP ecotourism, namely:

1. The conservation area must focus on sustainable ecotourism development. The conservation support for natural area consists of two criteria, namely:
 - a. The protection of fragile flora in ecosystems must prioritize on the core zone that are easily fragile

((Flaherty et al. (2019), Nor et al., (2017), Baral, Guariguata, & Keenan, 2016, Abdullah et al. (2015), Kariminia et al. (2013), Makhzoumi, Chmaitelly, & Lteif, (2012). Their biodiversity is low but the natural beauty is unique and rare plants such as edelweiss flowers;



Figure 4. Flora diversity in TNGGP.

The TNGGP has more than 1,500 species of plants which are included in flowering plants, nails, mosses, and talus plants. In 1959, a well-known botanist named Meijer, found about 330 species of plants in one hectare. The Forests around the Gunung Gede Pangrango national park can be classified into three main ecosystem types, namely the sub-montane ecosystem (1,000 - 1,500 m above the sea level), Montana (1,500 - 2,400 m asl) and sub-alpine ecosystems (2,400 - 3,019 m asl). Sub montana forest ecosystems have the highest diversity of plant species, characterized by large and tall trees and forming towering canopy (30-40 m). The dominant tree species in this area are Rasamala (*Altingia excelsa*), Saninten (*Castanopsis argentea*), Tide (*Lithocarpus* spp) and Huru (*Litsea* spp). The diversity of these tree species allows various types of epiphytes, lianas, tera, ferns and mosses, so that the state of the forest becomes very tight. The diversity of plant species in Montana forest decline, the lower plants are not too tight, epiphytic plants begin to be dominated by moss plants. The tree species that dominate the ecosystem are Puspa (*Schima wallichii*), Jamuju (*Dacrycarpus imbricatus*), and Kiputri (*Podocarpus neriifolius*). In the sub-alpine ecosystem the diversity of plant species is getting poorer, the size of the trees is small and is dominated by the type of Cantigi (*Vaccinium varingaefolium*) and Kitanduk (*Leptospermum javanicum*). Tree boles, rocks, even soil is grown by the moss which is quite thick. In this ecosystem, Edelwis Jawa (*Anaphalis javanica*) is a symbol of the success of mountain climbers. In Suryakencana Square (Gunung Gede) and Mandalawangi (Mount Pangrango) there are grasslands that are overgrown by Edelwis (*Anaphalis javanica*). The dominant type of grass in this area is mountain grass, namely *Isachne pangerangensis* and *Agrotis infirma*. On the edge of the square overgrown with shrubs and shrubs include Cantigi (*Vaccinium varingaefolium*) and kitanduk (*Leptospermum javanicum*).

b. The unique and rare fauna species protection means that in conserving is absolutely protected (Green, Zipkin, Incorvaia, & Holekamp (2019), Jambari et al. (2019), Evans, Asner, & Goossens (2018) and Zimmerhackel et al. (2018). It should not be disturbed by visitors because it will threaten their extinction.



Figure 5. Fauna Diversity in TNGGP.

Nowadays The TNGGP has a high diversity of species consisting of birds, mammals, insects, amphibians, reptiles and others. The abundant of bird species in this region is high. Around 260 of the 450 species of birds that live in Java (around 53%) are recorded as living in the region. The number of endemic bird species that live in TNGGP render it to be one of the world's endemic bird areas. A number of 21 species of 25 bird species endemic to Java and Bali live in this region, such as Javan Hawk-eagle (*Spizaetus bartelsi*), Raja Undang (*Halcyon javensis*) and others. In the area of TNGGP there are also recorded around 58 rare species of birds and are protected by law. TNGGP is also a place to live for four types of primates, two of which are west java endemic and are already rare, namely Owa (*Hylobates moloch*) Da surili (*Presbytis comata*). There are 103 types of mammals living in this area, more than 13 types are rare and protected by law, including Leopard (*Phantera pardus*), Forest Dog (*Cuon alpinus*), Singung (*Mydaus javansis*), Pangolin (*Hystrix javanica*), Deer (*Muntiacus muntjak*) and others. TNGGP has also many types of insect identified with number 300 types. Insects that attract attention are butterflies, among others *Dodona adonira windu*, *Vanessa cardul*, *V.canae javanica*, *Danais albata*, *Celestrina ceyx*, *C.singalensis astarga*, *C.dilecta pareadilecta* dan *C.askasa*.

2. Increasing the community around TNGGP role means that sustainable ecotourism development must involve community participation both living around the ecotourism area, business world and other related institutions such as universities. To build the community participation, there are two criteria:

a. Community welfare means that the community will grow its participation if they get the economic benefits from the existence of an ecotourism area. It also must consider the local wisdom (Vitasurya, 2016). In other words, a welfare factor is one of the requirements for the community participation in sustainability ecotourism (Angelsen et al. (2014), Herdiansyah, Soepandji, Seda, & Dewi (2014), and Christie & Rayment (2012).

b. The level of environmental awareness means that the community will intensify its participation to protect the environment if they have high level of environment awareness. Currently TNGGP has initiated education and natural tourism packages activities. The packages provided are: Revealing the Secrets of the Mountain Tropical Rainforest, Revealing Life in the Tree Head, Tracing the Origin of Our Drinking Water, Following in the Footsteps of Scientists, Out Bond, etc. (BBTNGGP, 2017).

3. Unique ecological experience for visitors. Each visitor must get a unique natural beauty experience that cannot be obtained from other areas. The expectation of visitor is such as seeing the uniqueness of natural phenomena, hearing the sounds of rare animals such as Javan Gibbons, enjoying the beautiful view of the sunset from the mountain peak. To provide it, there are two criteria that must be fulfilled, namely:

a. The improving of service ability of TNGGP Staff aims to improve the unique ecotourism experience visitors and become loyal visitors. TNGGP has structured and developed staff competency. Through the improvement of the education of all TNGGP staff, the service will be higher for visitors. The development of the education level of TNGGP staff show according to the following :

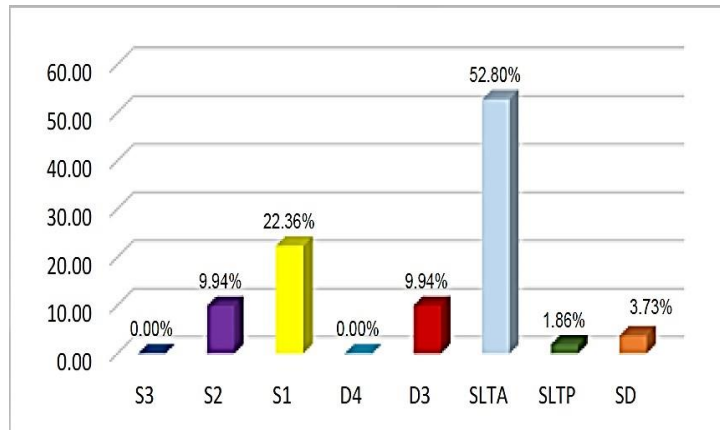


Figure 6. The development of the Number of BBTNGGP Employees EducationLevel year 2016.

b. The Management of TNGGP Entrance Rates. The financial entry rates management means the increasing of TNGGP revenues for an investment in conservation activities (Quezada-Sarmiento, Macas-Romero, Roman, & Martin, (2018), Hejnowicz, Raffaelli,Rudd, & White (2014), Ramdas & Mohamed (2014), Mombo et al. (2014). It can be a protector and market share strategy for visitors. In the holiday season, TNGGP can apply expensive tickets so thevisitors who enter will be limited. In detail, TNGGP receipts in 2016 can be seen in the following graph:

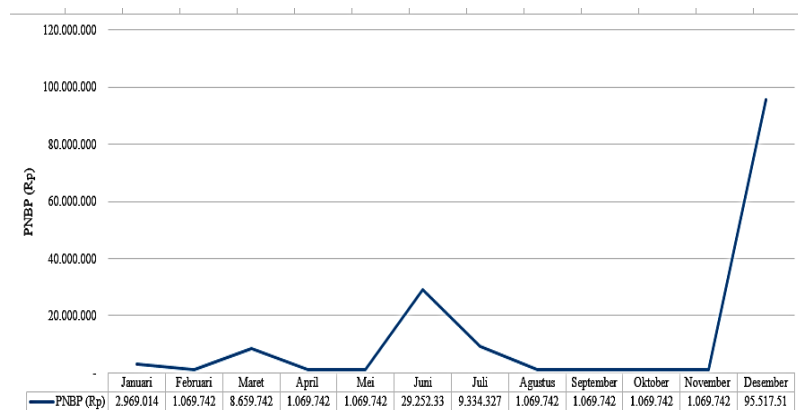


Figure 7. Non-Tax State Revenues from tickets and others in TNGGP year 2016.

Source: TNGGP Statistic (2017).

The main focus of the principle of the TNGGP sustainable ecotourism development is focused on preserve the area conservation, especially for fragile ecosystems. It is the main principles and criteria that must be adhered to. This means that regardless of the importance of sustainable ecotourism development, regional conservation must not be ignored. Based on the results of the AHP analysis above, policies on ecosystem management are the main priority (Lago et al. (2019), Ingelmo (2013) and Janusz & Bajdor (2013). The management of ecological and aesthetic potential should indeed be a top priority in the sustainable ecotourism development. The biodiversity and its ecosystem are the biggest attraction of ecotourism. The defective ecology will decrease visits

Sustainable ecotourism development absolutely requires community participation with criteria for increasing environmental awareness (Samad et al., 2019) and improving the welfare level of local communities living around the TNGGP area. this is supported by the statement of Nugroho, Pramukanto, Negara, Purnomowati, & Wulandari (2016). Communities around ecotourism areas must be involved starting from the planning

activities to the implementation and monitoring and evaluation of an ecotourism area. The community potentials can be utilized as tourism objects that can support natural areas as the main tourist attraction. So the local community can act better in understanding of the sustainable ecotourism importance by itself. The role of management in sustainable ecotourism development plays an important role. The entry rate management is a determining policy for the ecotourism activity sustainability (Pranawukir, 2021). The offering of attractive advertisement packaging as well as environmental education. It can enhance the ecotourism sustainability also (Nicula & Spânu, 2014). The market share determination is a strategy that can stimulate better and bigger visitors. Restrictions on the number of visitors and the provision of environmental education are also important to maintain the visitors' environmental care behavior (Abdul Wahab Samad et al., 2023).

CONCLUSION

The ecotourism development design must involve the integration of demand and supply side of ecotourism by applying the principles of sustainable development. This development process requires regional conservation policies, increased community participation around TNGGP and visitors' unique ecological experience improvement policies. The policy must be applied with priority on the protection and maintenance of the fragile TNGGP ecosystem protection, the activities to improve community welfare around TNGGP, the protection of unique and endangered species, the provision of environmental education among visitors and residents in the TNGGP, management efforts towards TNGGP entry rates, fostering TNGGP staff to improve services for visitors, unique ecotourism experience activities and environmental awareness raising for all stakeholders in TNGGP. The application of the ecotourism sector policy development process is expected to generate the ecological benefits for the improvement and preservation of the environment, economic benefits for the community and provide positive values for the social life to incarnate of the sustainable ecotourism area.

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