INTERNATIONAL CONFERENCE ON ECOTOURISM

"Ecotourism Destination Management for Small Islands in Adapting Climate Change Challenges"

Ministry of Foreign Affairs
Republic of Indonesia

Center for Tourism Studies
Universitas Gadjah Mada

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NATURE-BASED RECREATIONAL ACTIVITY AND FACILITY DEVELOPMENT FOR ECOTOURISM OF TAMAN WISATA ALAM GROJOGAN SEWU, TAWANG MANGU, INDONESIA

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Abstract

The landscape potency and visitor interest enthusiasm have enhanced the trend of visit to Taman Wisata Alam Grojogan sewu (TWAGS). The waterfalls and natural site of TWAGS are as main attractions, however planning of nature-based recreational activity and facilities for ecotourism development has been thought and analyzed. The project objectives were to improve advantage of the recreational site through development of activity program and facilities in quality and quantity based on landscape characteristics and visitor data. Approaching the recreation planning method, analysis of site potencies and problems developed by Gold (1980), the method was based on analysis technique on various maps of site characteristics. Maps of slope, land use, vegetation, potencies of landscape view, activity trails, activity intensity, and existing facilities were analyzed and synthesized to develop ecotourism of TWAGS.

The concept of Nature Park TWAGS lead to enhance the advantage of whole site potencial of the landscapes by spreading activity on the site in programs of nature-based recreational activities, to plan quantitative and qualitative the nature-based recreational facilities in TWAGS. The programs upgraded to natural recreation of educational and conservation aims for visitors in various ages, disable (difflable) people and all economical segments of visitor. Than, nature-based recreational activity and facilities were developed to meet the needs of nature park and the concept of integrated ecotourism activity plan.

Keywords: nature-based recreation, activity, facilities, Grojogan Sewu.

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Introduction

The natural area including of forests has potential opportunity as nature-based recreation. Nature has always offered an extraordinary appeal to people for countless reasons: the romance of adventure, the promise of the unexpected, the chance to find beauty and other benefits in human being. The forest in particular have offered a wide range of opportunities and challenges for people that have proven strongly seductive over the course of human history. Recreation plans can be classified by their scope, orientation, geographic area, or client. A component of recreation plans should be devoted to special populations, e.g. the handicapped or disadvantaged. Recreation plans can also be classified by the client, planning area, or level of government it serves. These differences determine the orientation, scale of analysis, and product of any recreation planning effort. They can also help determine the types of users, service area, and supplier of different kinds of recreation opportunities (Ray, 2003).

The new view of planning sees the process as dynamic and incremental. It begins with the values, behavior, or priorities of many people and accommodation. Some terms regarding recreation are explained as outdoor recreation, park and recreation planning. First, recreation is any leisure time activity which is pursued for its own sake, or what happens to a person as result of a recreation experience. Outdoor recreation is leisure time activities which utilize an outdoor public or private space. Park is any area of public or private land set aside for aesthetic, educational, recreational, or cultural use. Recreational planning is a process that relates people to leisure time and space. The use of information to create designs that relate to existing or potential users of a recreation space or population of a planning areal (Gold, 1980).

This agenda is a guide to four goals protect the ecosystem to guarantee that special natural settings are available for future generations, increase service satisfaction and education of Americans about their public lands, build community connections to expand available resources, and improve relationships to get the job done (Ray, 2003). The outdoors has always offered an attractive array of opportunities and experiences for people. Only relatively recently has it become important to understand what people do and why as noted in the section on legislative interest. Much of the interest evolved in response to a recognition that what people do affects the natural environment incrementally over time (and vice versa). Knowing the resources and appropriately managing them for use important is offering people high quality opportunities for a variety of experiences while keeping the natural environment healthy for current and future generations. Clearly people participate in outdoor recreation for many personally important reasons. The survey also revealed that those who were active in outdoor recreation rated quality of life higher than those who participated less frequently.
Outdoor recreation is important to and pursued by a large number of individuals. It is apparent that the trend for participation in outdoor recreation is increasing. Nowadays, nature-based recreation plays an important role in sustaining human life and concerning conservation along with improvement quality of life and useful of the richness of Indonesian flora fauna through ecotourism development.

Eventhough, the TWAGS is one of many potencial places of nature park in Indonesia with plentiful flora fauna and scenic beauty of landscape, does not have accurately a recreation management plan, than the optimal requirement of nature-based activity and facilities have been taking into account through ecotourism development focusing in conservation and education aspects. The project objectives were to improve advantage of the recreational site through development of activity program and facilities in quality and quantity based on landscape characteristics and visitor data towards ecotourism development in TWAGS.

Method

The project located at Taman Wisata alam Grojogan Sewu (TWAGS) was conducted by survey method. Multiple factors of site characteristics were identified as integral to positive recreational factors (potencial) and negative recreational factors (problems). The analysis was defined by Mc Harg (1967), Gold (1980) and Gul et. Al. (2006) through field survey and previous research data. Recreational factors including vegetation, slope, visual values, and activity tracking line were taking into account in analysis for ecotourism development plan (see Figure 1).

Visitor data was referred previous research by Handayani (2011). Visitor age, sex, education, and works were as supporting data to improve the site existing plan. The data were preferred to correlate the site characteristics analysis and visitor activity in the park. Activity program development proceeded to facility improvement in quality and quantity based on recreation planning standard.

Figure 1. Schematic process project

Session II : Cluster Presentation
This study was carried out in Taman Wisata Alam Grojogan Sewu (TWAGS) the nature park which located at the Karanganyar District of Central Jawa Province. The whole area of park covers 64.3 Ha and the park is in 20.2 Ha. The park is famous with beautiful waterfall as a main attraction inside the park. The waterfall covers 81 m height with white and high water debit are felt from 1025 m altitude. The TWAGS is located in highland range 900 - 1100 m altitude and at range 7°39'17'' - 7°39'49''LS dan 114°18'33'' - 114°20'16''BT.

![Map of Central Java Province with TWAGS marked](image)

Figure 2. Grojogan Sewu Waterfall, Karang Anyar is a main attraction located inside the nature park.

The nature-scenic beauty, diversity flora fauna in pattern of tropical rain forest, geomorphological features of TWAGS show generally recreational potency development and it became the nature park on October, 12 1968 through legal authority letter by Ministry of Agriculture no 264/KPTS/UM/10/1968. The TWAGS has been in management of Directorate of Nature Conservation and Forest Management, Ministry of Forestry. Nature tourism of the park has been managed by private company.

The mean annual rainfall is about 2000 – 4000 mm. The park has various slope from flat to steep land. Respectively, the mean air temperature are 10°C and 25°C and surrounded by Samin River and Blumbang River.

Results

Figure 3 shows the nature park, especially around the waterfall generally has been special usage for picnic activities. The nature park has aesthetic scenic, small restaurant, toilets, swimming pool, a small mosque and many local people
give rent matt for picnic. Visitors heavily go down the stairs to entry the park and step up the stairs to the exit about 100 m length. The park is currently used for limited recreational activities, such as no-arrangement picnicking, playgrounds, and walking trails.

![Figure 3. Topography and Existing Features of TWA Grojogan Sewu Tawang Mangu](image)

The nature park of TWAGS covers the tropical rain forest at highland with diversity flora, dominated by pine trees (*Pinus merkusii*). Other vegetation are Puspa (*Scima walichii*), Kaliandra (*Caliandra sp.*), Mahoni (*Swietenia mahagoni*), Flamboyan (*Delonix regia*), Beringin (*Ficus benjamin*), Suren (*Toona sureen*), Benda (*Artocarpus elastica*), dam Kantil (*Michelia champaca*).

The diversity of fauna are often find such as monkey long-tailed mongkey (*Maccaca fascicularis*), jalak putih lawu bird (*Sistrurus usmelanopterus*), tekukur bird (*Streptopelia chinensis*), kutulang (*Psithyrurus caferauregaster*), prenjak (*Prima rufescens*), perkutut bird (*Geofilia striata*), gelatik batu (*Parus mayor*), jalak uren (*Sistrurus ontra*) and kacamat bird (*Zosterops palpebrosas*).
Figure 4. Diversity of flora fauna has the uniqueness as potential aspect for nature-based recreation.

The flora fauna characteristics of TWAGS were covered on the site as performed as spacial use of landscape. Figure 5 distributes recreational site including eight spacial types: 1) main entrance, 2) pines trees/steep land, 3) waterfall attraction, 4) hiking on steep land, 5) picnic ground, 6) second entrance area/exit one/picnic ground, 7) shrubs, and 8) pines trees.

Figure 5. Nature-based Recreational Spacial potencial of TWAGS

Based on field observation less than 50% of nature park area was used for recreation. The activity tracking such as hiking has not been spread evenly across inside the site and the recreational activities are concentrated in the waterfalls area. Figure 6 shows intensive recreational area dominated in the centre of nature.
park that relatively on flat slope or less than 10% slope. Because of large area of steep land inside the park and heavy material of vegetation, small number of recreational activity has been occurred in 10% and up of slope or flat land (Figure 7).

Figure 6. Distribution of Activity Intensity in TWA GS

Figure 7. Slope Analysis of TWAGS
Slope variations in TWAGS can be planned for various activities and facilities. Beer (1990) makes various types of land use suitability based on slope analysis (Table 1). Figure 7 performs three types of slope inside TWAGS included flat slope (angle slope 0-10%) was approximately 25% of area, moderate slope (angle slope 10-40%) was approximately 40% of total area and slope high/steep land (angle slope > 40%) covered about 35% of the nature park. Semi intensive – no intensive activity can be seen on medium-high slope of TWAGS, than it is necessary to improve facilities for nature-based recreation (see Figure 6).

Table 1. Type of land use based on permitted angle of slope (Beer 1990)

<table>
<thead>
<tr>
<th>Type of land use</th>
<th>Permitted angle of slope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streets and drives</td>
<td>8%</td>
</tr>
<tr>
<td>Parking areas</td>
<td>5%</td>
</tr>
<tr>
<td>Main footpaths - bitumen/asphalt</td>
<td>8%</td>
</tr>
<tr>
<td>Main ramp on footpath - short</td>
<td>14%</td>
</tr>
<tr>
<td>Entrance areas</td>
<td>4%</td>
</tr>
<tr>
<td>Minor footpaths</td>
<td>14%</td>
</tr>
<tr>
<td>Terraces – paved</td>
<td>2%</td>
</tr>
<tr>
<td>Lawns</td>
<td>5%</td>
</tr>
<tr>
<td>Mown grass banks</td>
<td>33%</td>
</tr>
<tr>
<td>Planted slopes</td>
<td>50%</td>
</tr>
</tbody>
</table>

Beer (1990)

Table 2. Slope analysis of TWAGS

<table>
<thead>
<tr>
<th>Slope analysis of TWAGS</th>
<th>Angle of slope</th>
<th>Nature-based Recreational Activity</th>
<th>Nature-based Recreational Facility</th>
</tr>
</thead>
<tbody>
<tr>
<td>The gently sloping and flat land</td>
<td>&lt; 10%</td>
<td>Walking, tracking, picnic, resting, Children playing</td>
<td>Footpath, Children Play Ground, Picnic ground/terrace,</td>
</tr>
<tr>
<td>The moderately sloping land</td>
<td>10-40%</td>
<td>Hiking, hard tracking</td>
<td>Board information, natural trail</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>--------</td>
<td>------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>The steep and the very steep land</td>
<td>&gt;40%</td>
<td>Climbing, Rock climbing</td>
<td>Climbing facility information board, natural trail</td>
</tr>
</tbody>
</table>

The various slope of TWAGS was overlaid with the beauty and unique scenery proposed development of nature-based recreational activities and recreational facilities. Table 2, Figure 8 and Figure 9 show programme and synthesis of slope and visual scenic to realize nature-based recreational activity and facility.

Figure B. Visual scenic of TWA Grojogan Sewu Tawang Mangu
Characteristics of Visitor in TWAGS

Visitor in TWAGS was dominated by young people (15-24 years old), male, under graduate and student (Suripto, 2008, Arifah, 2010 and Handayani, 2011). The data was not inclusive of disable people, and children. However, based field observation the children has often visited to the nature park. In the last five years, foreign people has came about 1500 people per year. It can be compared with domestic people about 350,000 people per year. The majority of the visitors came from Yogyakarta and surrounding or from Central Java Province. The main reason for their visit was picnicking or recreation. The average staying time in the park was 1 – 3 hours (65%) and 4-6 hours (17%), and staying one night (15%). They came with friends of family for enjoying the nature especially to come close to waterfall (see Table 3 and Figure 11). Most of the visitors usually came to TWAGS on Sunday, Saturday or national holiday. Figure 10 shows characteristics visitor of TWAGS according to sex ratio, age, education and working.
Figure 10. Visitor characteristics of TWAGS

Table 3. Most popular attractions of visitor

<table>
<thead>
<tr>
<th>No</th>
<th>Attractions</th>
<th>Percentage frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Water fountain</td>
<td>43</td>
</tr>
<tr>
<td>2</td>
<td>Culinary (Rabit Satay)</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Forest</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Natural resources</td>
<td>31</td>
</tr>
<tr>
<td>5</td>
<td>Fresh Air</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>Others</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Handayani (2011)
Figure 11. Potential visitor was 12 - 17 years. The intensive activity was close to waterfall.

Based on site characteristics and visitor data, it can be analyzed that the existing natural resource or TWAGS included the main attraction of waterfall and other attraction of vegetation, river, unique contour has been able to be develop their advantage for increasing visitor. The potential young visitor that have status of student, the orientation of recreation should be guided to education eventhough conservation reason. Thus, these were supported by natural resources of flora fauna diversity. They can be learning about the species, the habitat, the characteristics of flora fauna, the vegetation growth, the animal behavior and learning any other knowledge of nature. Simultaneously, learning about nature knowledge, the visitor can concern in protecting and conserving the natural resources of the nature park.
Figure 12.1.
Activity Development potential
A. From and to Gate 3
B. From Gate 3 to Gate 2
C. From Gate 2
D. From Gate 3 to near Gate 1

Spread program of activity to the whole potential area :
- Concentrated activity area
- Existing activity area
- Activity development area

Figure 12.2
Activity Development Program
1. From Gate 3 to Gate 1 (long tracking)
2. From Gate 3 to Gate 1 (short tracking)
3. From Gate 2 to Gate 2 (medium tracking)

Figure 12.3
Pathway Development Program
1. Main pathway (existing)
2. Second pathway (existing and development)
3. Path for disable people (development)
4. Hiking path (development)

Figure 12. Activity tracking analysis of TWA Grojogan Sewu Tawang Mangu
The student can also learn how should the local flora fauna be maintained and be growth. Thus, the nature-based recreational activity have to be supported by the facilities inside the park. The main idea was to improve the quality of existing facility and increase the quantity of facility types.

To proceed through the development of ecotourism, Figure 12 performs three analysis on maps of nature-based recreational activity. Basically, concerning carrying capacity of the whole area, the concentrated activity near to waterfall has to be spread to the whole potential nature park (see Figure 12.1). Than, Figure 12.2 shows the program of activity that was spread out inside the site by improving types of activity especially recreational activity on moderate-steep land. Area of pine trees, shrubs on moderate-steep land of land was not effectively in usage for activity in TWAGS. In order to support the activity program, the pathway program was developed on map Figure 12.3. The existing pathway has been not enough in quantity and quality. The pathway needs development as main pathway (about 1-2 m in width), second pathway (about 0.80 - 1 m in width), pathway for disable people and hiking pathway.

Table 4. Check list of facility development in TWAGS

<table>
<thead>
<tr>
<th>No</th>
<th>Facilities</th>
<th>Existing</th>
<th>Proposed/new</th>
<th>Improving Quality</th>
<th>Increasing Quality</th>
<th>Ecotourism Aspects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>V</td>
<td>V/V</td>
<td>V</td>
<td>V</td>
<td>V/V</td>
</tr>
<tr>
<td>1</td>
<td>Entry and exit Gates</td>
<td>V</td>
<td>-</td>
<td>V</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>Natural Trails</td>
<td>V</td>
<td>V/V</td>
<td>V</td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Swimming pool</td>
<td>V</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Bridge</td>
<td>V</td>
<td>V/V</td>
<td>V</td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>Shelter</td>
<td>V</td>
<td>V/V</td>
<td>V</td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>Toilet</td>
<td>V</td>
<td>V/V</td>
<td>V</td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>Small Restaurant</td>
<td>V</td>
<td>-</td>
<td>V</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>Bench</td>
<td>V</td>
<td>-</td>
<td>-</td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>Security office</td>
<td>V</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>No.</td>
<td>Facility</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>-----</td>
<td>---------------------------------</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
</tr>
<tr>
<td>10</td>
<td>Children play ground</td>
<td>-</td>
<td>V</td>
<td>-</td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td>11</td>
<td>Information board</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
<td>V</td>
</tr>
<tr>
<td>12</td>
<td>Orientation board</td>
<td>-</td>
<td>V</td>
<td>-</td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td>13</td>
<td>Ecosystem information board</td>
<td>-</td>
<td>V</td>
<td>-</td>
<td>V</td>
<td>V</td>
</tr>
<tr>
<td>14</td>
<td>Praying room (musholla)</td>
<td>V</td>
<td>-</td>
<td>V</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>15</td>
<td>Photospot board</td>
<td>-</td>
<td>V</td>
<td>-</td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td>16</td>
<td>Flying fox tower</td>
<td>-</td>
<td>V</td>
<td>-</td>
<td>V</td>
<td>-</td>
</tr>
<tr>
<td>17</td>
<td>Small movie</td>
<td>-</td>
<td>V</td>
<td>-</td>
<td>V</td>
<td>V</td>
</tr>
<tr>
<td>18</td>
<td>Danger board</td>
<td>-</td>
<td>V</td>
<td>-</td>
<td>V</td>
<td>V</td>
</tr>
<tr>
<td>19</td>
<td>Bird watching tower</td>
<td>-</td>
<td>V</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
<tr>
<td>20</td>
<td>Mini Museum</td>
<td>-</td>
<td>V</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>21</td>
<td>Vegetation name tag</td>
<td>-</td>
<td>V</td>
<td>-</td>
<td>-</td>
<td>V</td>
</tr>
</tbody>
</table>

The existing facilities in TWAGS was observed about the quality of material performance. Table 4 shows the existing facilities in TWAGS and check list of development. Poor quality of material was found and checked into improving quality check list. The facility quantity was predicted based on the recreational need on site. Standard of quality and quantity were referred to

Session II: Cluster Presentation
recreational standard planning and observed to the other nature park facility that has high standard as nature-based recreation area.

![Facility development of TWA Grojogan Sewu Tawang Mangu](image)

Analysis of facility needs and development was implemented in synthesis of the data of characteristics site and visitor. Figure 13 shows an alternative of facility development of TWAGS through concept of nature-based recreational activity and facility. The facility development program was focused to ecotourism aspects of education and conservation. There are any other alternative program and plan that needs process of design for ecotourism plan. The concept of integrated ecotourism activity plan is facing the need of ecotourism demand focusing on aspects of conservation and education. The further research or projects prefer development of nature based recreational activity and facility to other aspect of ecotourism, such as local community and economics.
Conclusion

The basic aim of development of nature-based recreational activity and facility in TWAGS should be to reveal the existing natural resources potential of the nature park as natural attractions that can be source of reasons of visit. Otherwise, the activity of visitor should be guided not only in enjoying the nature as recreation but also conservation and education reasons. Ecotourism is facing the integrated activities supported by planning and design of facility that was based on sustainable protected natural area. There are plentiful programmes of ecotourism can be developed in TWAGS with its natural resources and the trend of visitor, than strategic management planning and master plan should be the needs.
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USA.


