

Identifying Interesting Sceneries and Objects in A Tropic Forest Through Visitors Employed Photography

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ABSTRAK

Hutan Tropis merupakan karakter lanskap hutan yang unik disusun oleh objek lanskap vegetasi dengan berbagai strata ketinggian yang berpadu dengan elemen lanskap biotik dan abiotik lainnya. Paduan objek lanskap hutan tropis tersebut menghasilkan karakter lanskap hutan tropis yang secara visual menarik bagi pengunjung. Hingga saat ini masih sedikit referensi mengenai pemandangan dan objek hutan yang menarik bagi pengunjung hutan padahal informasi tersebut sangat penting bagi wisata hutan. Dalam penelitian ini, kami mengidentifikasi pemandangan dan objek hutan tropis yang menarik bagi pengunjung hutan melalui foto yang diambil langsung oleh pengunjung di lapangan. Metode yang digunakan adalah Visitors' Employed Photography (VEP) yang dipadukan dengan GPS tracking serta kecerdasan buatan Google Clouds Vision API. Dalam metode VEP ini kami mengundang 41 Responden untuk berjalan-jalan di Hutan "Situ Gede" dan memotret objek yang menarik langsung di lapangan. Kami memperoleh 1,206 foto dari responden yang berisi pemandangan dan objek hutan "Situ Gede" beserta lokasi titik pengambilan foto. Foto-foto tersebut diberi label melalui Google Cloud's Vision API dan diklusterisasi berdasarkan label setiap foto ke dalam 15 cluster foto menggunakan software R Statistics. Dari hasil pengelompokan tersebut diidentifikasi tiga jenis tipe pemandangan dan objek yang menarik menurut responden, yakni pemandangan dan objek "Pemandangan tegakan pohon di dalam hutan atau rimba", "pemandangan hutan yang berisi kegiatan rekreasi dan satwa", serta "badan air, tepi badan air, saluran air, dan pepohonan." Informasi ketiga karakter lanskap hutan tropis tersebut sangat berguna dalam kegiatan pengelolaan hutan tropis dimana pemandangan dengan ketiga tipe tersebut perlu dikonservasi guna pengelolaan hutan wisata.

Kata kunci: pemandangan, lanskap, hutan, VEP, GPS

ABSTRACT

A Tropical Forest is a unique forest landscape character composed of vegetation with various altitude strata combined with other biotic and abiotic landscape elements. The combination of landscape objects produces a landscape character that is visually attractive to visitors. There are few references to forest sceneries and objects of interest to forest visitors, even though this information is important for forest tourism. This study identified tropical forest sceneries and objects of interest to forest visitors through photographs taken by visitors. The method used is Visitors' Employed Photography (VEP) combined with GPS tracking and artificial intelligence Google Clouds Vision API. In this VEP method, we invited 41 respondents to walk in the "Situ Gede Forest" and directly photograph interesting objects in the field. We obtained 1,206 photos from respondents containing the scenery and objects of the "Situ Gede Forest" and the location of the photo-taking points. The photos were labeled via Google Cloud's Vision API and clustered based on the Photo's label into 15 photo clusters using R Statistics software. The grouping results identified three sceneries and objects that interested the respondents: "View to the standing of trees inside the forest, woodland, or jungle," "Forest scenery with recreational activities and zoo," and "Body of water, edge of the body of water, waterway, and trees." Information on the three characteristics of tropical forest landscapes is beneficial in tropical forest management activities, where landscapes with these three types must be conserved and preserved in the interest of sustainable tourism forest.

Keywords: sceneries, landscape, forest, VEP, GPS

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1. Background

Forests are useful in producing forest products and can also be used as a means of public recreation.

Forests as a place for public recreation are very psychologically useful for visitors, among others, to improve mental health (Song et al., 2018) and reduce

negative mood and stress (Bielinis et al., 2019). One form of public recreational activity in the forest is to see forest scenery. Forest scenery is very important to pay attention to because one of the public's motivations for visiting the forest is to enjoy the beautiful scenery (Liu et al., 2019).

The forest landscape is related to the character of the forest landscape, which is composed of forest landscape objects, both natural and artificial objects, which combine to become a certain forest landscape character. The natural character of the scenery is, of course, the main attraction in the tourist forest. The character of the natural-looking scenes and recreational-looking forest scenes was interesting for forest tourism activities (Eriksson et al., 2012). Therefore, in a tropical forest landscape for tourism, the interesting forest view and objects to visitors must be used to formulate a tourism forest program in tourism forest planning.

However, information about interesting objects visitors is difficult to analyze because the aesthetic evaluation varies greatly according to individuals' opinions about the interesting objects (Lee et al., 2019). However, research on visual quality has been carried out for a long time. There are three research approaches for the visual quality of landscape views, including field surveys, photos, and VR simulations (Gao et al., 2019). In this case, photos are an important medium in visual research because they can express themselves, their views, and their image of their worlds (Meo, 2010). The photos are a valid surrogate for the real landscape representing visitors' visual preferences (Jacobsen, 2007).

Visitors' Employed Photography (VEP) is a method to obtain landscape perceptions based on photos taken by a group of people (Heyman, 2012). The VEP method is a visual analysis method of landscape objects carried out directly at the study site (in situ) by a group of people using photos as a medium to present these interesting objects. In this VEP method, the observer feels a visual experience at the study location then chooses the interesting object from the many objects on the site. Although there is no difference between visual preference assessment based on the experience (in-situ) and ex-situ photo-elicitation (Gao et al., 2019), VEP research still needs to be carried out to conserve and preserve impressive

sceneries on-site based on visitors experiences. Without in-situ visual preferences research, there are potential problems of wrong decision-making management related to visual landscape assessment. On the other hand, VEP research is rarely used to assess the visual preference of landscapes in Indonesia.

Both inside and outside the forest, forest scenery resources are related to human preferences as observers and where humans see the landscape. The visitors' photo-taking activity is related to the visitors' movements. People's movement in the landscape can be detected using GPS (Pettersson & Zillinger, 2011). The visitors' photos can also be geotagged by integrating photos and GPS tracking methods to identify the images' captured location (Sugimoto, 2013). The results of recording data on GPS combined with Spatial Analysis in GIS can produce very accurate and detailed information about human spatial patterns in the landscape (McKercher et al., 2012). The concentration of photos-taking location as the spatial analysis output in GIS can be considered a basis for zoning in landscape planning activity. We combined VEP and GPS tracking methods in this study based on the importance of the pattern of photos-taking location for landscape planning. The study's objective is to identify impressive landscape objects and sceneries that need to be conserved or preserved based on respondents' in-situ experiences. Impressive objects and sceneries are important for the sustainability of forest tourism or recreational landscapes.

2. Method

The "Situ Gede Forest" is located in Bogor City at 57.5 ha with an altitude of 244 meters above sea level (Forest Research and Development Center, 2015). The site study is only 34.6 ha inside local road boundaries (Figure 1). The Forest Research and Development Center, Ministry of Environment and Forestry, Republic of Indonesia, manages the "Situ Gede Forest". The "Situ Gede Forest" is currently a forest with tall tree stands, a deer breeding ground, and a selling area with a seating area with a view of the "Situ Gede Lake." The forest is open for general public recreational activities without any entry ticket.

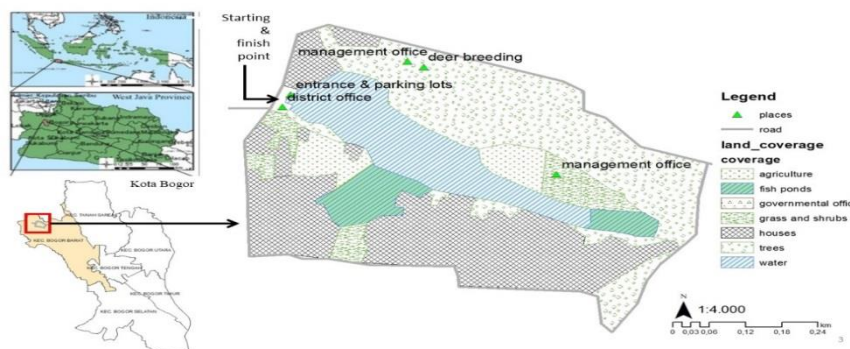


Figure 1. Site Location

The respondents' photos were captured in March 2016, but the analysis was conducted in 2020 due to the limited time and human resources who input and analyze data. During the period, forest landscape sceneries had no significant visual changes. Forty-one respondents were based on their educational background; 16 were landscape architecture students, and 25 were ordinary people (non-students) without an academic background in landscape architecture. Students were selected as respondents because they have basic aesthetic knowledge of a landscape used to determine objects or interesting views on the site. Respondents from the general public were chosen because one of the functions of this forest is as a recreation area for the general public. They were recruited on-site and via the social media Facebook. We did not differentiate between student respondents and the general public because, according to Gao et al. (2019), there is no significant difference between respondents with different professional backgrounds. All respondents were invited to the site on an alternate schedule because GPS loggers are limited.

The method used in this study is Visitors' Employed Photography (VEP) combined with Google Cloud Vision API, cluster analysis, and GPS tracking. The four methods are combined to obtain measurable data on the interesting sceneries and objects that visitors like, the character of the sceneries and objects, and popular locations to see the interesting sceneries and objects. The VEP method can evaluate human perceptions of forest vegetation and forest management (Heyman, 2012). In the VEP method, respondents were invited to the site and walked inside the area. The walking direction is free with the same starting and finish points. We asked respondents to take photos of sceneries and objects they thought were interesting during walking. Respondents chose interesting sceneries or objects based on their walking experiences. Whenever the respondents saw an interesting object, they were asked to take photos using their respective cameras or smartphones. The photos were then sent to the researchers online or transferred directly to the researchers' laptops. Photos that were not relevant in this study, such as photos that respondents accidentally took, photos that lacked focus, blur, moving photos, and duplicated photos, were eliminated.

Each respondent had an "IgoutU" GPS logger that recorded the respondent's geographic location every second while walking and taking the Photo on the site. The GPS logger data was recorded in the form of a GPX file, where one GPX file represents the movements of one respondent. The "IgotU" GPS logger receives satellite signals and records geographic position data from the GPS logger per second. Thus, one data logger represents the respondent's geographic position while walking at that second. Time data from the GPS

logger and photo-taking time data are combined so that each Photo will have geographic information in the form of the location where the Photo was taken at that second. Geotagged photo data from all respondents were put together to analyze popular locations for taking photos as a whole and per cluster.

After the respondent has finished walking, the GPS logger is returned to the researcher, and the GPS logger data is processed on the computer. Furthermore, adjustments are made between the photo-taking time data and the GPS data so that each Photo has a geographic location where the Photo was taken while on the path of travel. The software used for adjusting GPS logger data and photo time data uses the online Geosetter software. Using this software, the geographic location of the photo-taking can be identified. The photo-taking point already has geo-location information and becomes data processed to determine the Photo's label through ArcGIS's Google Cloud Vision API and Hotspots analysis.

We used Google Cloud Vision API software to label each Photo. The Google Cloud Vision API can detect and extract information about entities across a broad group of categories in an image. The Photos' labels are the Google Cloud Vision API analysis results. The image below explains the example of photo labeling in Google Cloud Vision API (Figure 2). The example photo was labeled with Plant (96%), Tree (90%), Natural Environment (89%), and so on. The similarity of labels from one Photo to another is the basis for photo clustering using the R statistic. Each photo label was clustered, and the results were used to identify the character of the sceneries and objects of the forest.

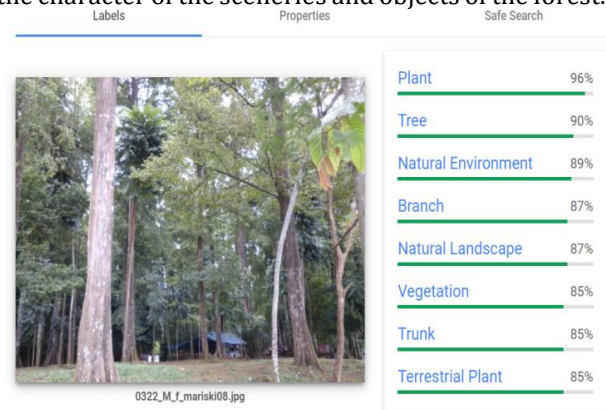


Figure 2. Example of Google Cloud Analysis's Vision API

3. Results

The main landscape object in "Situ Gede Forest" is the old-growth trees. There are 127 trees apart from the bamboo, rattan, and Palmae family. The trees comprise 88 clans and 43 families (Forest Research and Development Center, 2015). Therefore, the trees in "Situ Gede Forest" look pretty diverse. Visitors who walk inside the forest will feel the atmosphere under the trees' canopy, with the main attraction being the old-growth tree forest.

Table 1. The Labels of Photos of "Cluster B," "Cluster F," and "Cluster A"

Cluster	labels	Number of photo points	Observed mean distance (m)
B	Trees, Forest, Woodland, jungle	438	4,4823
F	Plants, Trees, Zoo, recreation	208	7,4689
A	Water, River, Bank, water resources	189	6,8525

Table 2. The pattern of points distribution of the three clusters

Cluster	Photo Label from Vision Cloud API	label score	The character of view and objects based on photo content	n Photos	n capturer	n Photo AND n capturer	photos per capturer
B	Tree	1	View to the standing of trees inside the forest, woodland, or jungle	438	41	17958	10,68
	Forest	1					
	Woodland	0,88					
	Jungle	0,88					
F	Plant	0,46	forest scenery with recreational activities and a zoo	208	35	7280	5,94
	Tree	0,45					
	Zoo	0,28					
	Recreation	0,21					
A	Water	1	body of water, edge of the body of water, waterway, and trees	189	35	6615	5,4
	River	0,98					
	Bank	0,96					
	Water resources	0,9					

The "Situ Gede Forest" also has deer breeding. This deer breeding aims to research and conserve deer as one of the tropical forest animals. The types of deer are Timor deer (*Cervus timorensis*), Sambar deer (*Cervus unicolor*), and Bawean deer (*Axis kuhlii*). The deer breeding is in a cage made of wire, and visitors from outside the cage can see the deer. Many visitors see deer in this place and take pictures.

The other landscape elements of "Situ Gede Forest" include a pond, corridors, non-permanent buildings, a trail, and a parking area. The non-permanent structures are tents to sell food and drink on the site. Many visitors rest in the tents area while looking at the view of the forest and lake. In addition, there are also block trails and ground-level trails for walking on the site.

Respondents who have experienced on-site took photos of the preferred object or view of the forest. In this case, experience in the forest is important because respondents can see objects and landscapes as a whole as one landscape without framing. Of the many choices of interesting sceneries and objects on the site, the respondents directly compared which objects or sceneries of interest were then photographed in the field. Therefore, the Photo that is considered attractive is already the result of a direct on-site election.

Identification of sceneries and objects that interested visitors has been successfully carried out. From 41 respondents, we obtained 1,206 photos of sceneries and objects of "Situ Gede Forest" that the respondents considered attractive. Each respondent's photo-taking rate is about 29 photos per person.

3.1. Interesting Objects on Respondents' Photos

One of the effects of implementing the VEP method in the current smartphone innovation period is that the number of photos produced is greater than the number of photos from VEP implementation when

using a manual camera. There are 1,206 photos collected from respondents consisting of objects and sceneries of the "Situ Gede Forest." All photos are then labeled and clustered into 15 clusters (see Appendix).

The fifteen cluster labels represent fifteen characters of landscapes and landscape objects in "Situ Gede Forest." Each cluster has a different number of photos. The three clusters with the highest number of photos are "Clusters B," "Cluster F," and "Cluster A." The three clusters show the landscape character that attracts the most visitors' attention at "Situ Gede Forest" (Tabel 1).

The most photos taken by respondents and the highest number of respondents are in "Cluster B," which contains a photo labeled "trees, forest, woodland, and jungle." The photos in this cluster include objects lined with trees or woodlands so that respondents feel the atmosphere of a forest, wood forest, or jungle. The number of photos in "Cluster B" is 438, with the number of photo takers being 41 people (Tabel 1). With the number of photo takers, it can be seen that all respondents took photos with landscape characters in "Cluster B".

The view of the "trees, forest, woodland, and jungle" is the character of the "Situ Gede Forest." Maintaining the landscape of "trees, forest, woodland, and jungle" is very important because it is the main attraction to visitors. The "trees, forest, woodland, and jungle" landscape characters are rows of trees with a straight trunk, free of high branches, a wide trunk circumference, plank roots, and little or no shrubs underneath. Respondents like to take ordinary photos and self-pictures under the trees' canopies, on high trees, on forest trails, or in between the plank roots of the walnut tree boards. However, the low trees, with many branches and many bushes under them, are not widely photographed by respondents because they are common in the community. Therefore, when the respondent entered the "Situ Gede Forest" forest and

saw a line of towering trees with free high branches and no bushes below, the respondent took a photo of the landscape because the scenery was not common or unique to them. The view to the straight trunk is a look-up view. Respondents can see the line of straight trees and their canopy in the look-up view, which is rarely seen in common Indonesian neighborhoods. Forest managers need to conserve the view of trees' canopy because look-up views are mostly high-valued landscape type (Mizuuchi, 2023).

The second most popular photo cluster is "Cluster F," which contains "plant, tree, zoo, recreation." This forest has a "deer breeding" as a recreational attraction for visitors. The deer and deer cage are situated under the shade of tall trees. The Photo's object consists of deer, the atmosphere inside and outside the deer cage, and the rows of trees as a background. Thirty-five respondents took this Photo with a total of 208 photos. A total of 55 photos from 208 photos in this cluster contain deer as the main object of the Photo. In addition to photos of deer, respondents also took pictures of insects, spiders, cat mammals, and selfies in the "*Situ Gede Forest*." The results show that the character of forest landscape of "plant, tree, zoo, recreation," consisting of animals, both in and outside captivity, is very attractive to respondents. The landscape's character with animals can become recreational objects in forest tourism.

There is also a reservoir lake at the "*Situ Gede forest*" site, called "*Situ Gede Lake*," for rice field irrigation, with an area is 5,27 hectares. The view towards the water body of "*Situ Gede Lake*" is the scenery that is attractive for respondents. A total of 35 respondents took photos containing the object of the lake and the forest atmosphere around the lake, with a total of 189 photos. The photos of the waterbody of "*Situ Gede Lake*" were clustered in "Cluster A" with photo labels including "water, river, bank and water resources." In this cluster, the photos taken are photos of the lake's water body, which is calm, slightly rippled, and has a mirror effect of objects on the ground across the lake. The reflected objects are the sky, clouds, trees, and houses. The view towards the lake and the effect of the reflection of objects across the lake are interesting sceneries for the respondents. From these results, we got information that water as an object is interesting for recreational activity.

Based on the results above, three characteristics of tropical forest landscape views can be identified with a case study of the "*Situ Gede Forest*," which is with free high branches and with no or little shrubs underneath, animal objects in the forest, and water objects with a forest background. If there is a scenic character in a tropical forest as above, then the landscape needs to be conserved and preserved because it is very useful as a tourist attraction. In addition, the above information can also be used in the design of tropical forests for recreation and new tourism. A tropical forest that has the above landscape elements can be preserved and conserved as an object of tourist attractions and forest recreation.

In a new forest design, rows of tall trees can be designed by selecting tall tree species free of high branches, wide trunk diameter, and unique characteristics such as plank-like root shape. The trees with these characteristics include *Koompasia* trees and Walnut trees, where these trees require a long time to grow up. Therefore, in the design of a new tourist tropical forest, it is necessary to consider the existence of trees with the above characteristics. The tropical tourist forest, which has the potential for the object of the tall tree line, will have a higher tourism potential than the forest with the types of trees that are not tall.

The tree line must also be supported by an atmosphere with no or little bush under the canopy. Therefore, maintaining tropical forests for recreation and tourism needs to prioritize thinning shrubs under tree canopies. This is to allow visitors to have a clear view of the trees.

Spatial analysis of the Photo-taking points

Observation points of interesting objects in a landscape are important to consider in planning, design, and landscape management. The popular observation locations are essential to be identified because they can support the forest tourism program. Based on the results, the objects that respondents mostly take are photos of trees, animals, and bodies of water. The next question is where to see these objects. Spatial Analysis in ArcGIS was used to identify locations where the Photo was taken and the points' spread.

Locations for taking photos from "Cluster B" and "Cluster F" are clustered in areas within the tree canopy and near the deer cage. Meanwhile, the location for taking photos from "Cluster A" is along the pedestrian path on the edge of the "*Situ Gede Lake*." Based on the spatial analysis of the Average Nearest Neighbor, it is known that the distribution of photo points in the three clusters has a Z-Score below -1.96 with a p-value of 0.000. It is concluded that there is a less than 1% likelihood that this clustered pattern could result from random chance (Table 2).

Based on the above analysis results, further spatial analysis was carried out, namely spatial Kernel density analysis, to identify where the focus of the photo-taking points from "Clusters B," "Cluster F," and "Cluster A" was. The photo-taking locations in the three clusters were concentrated in the forest north of the "*Situ Gede Lake*." Only a few respondents took photos of the southern part of the lake. In the southern part of the lake, there are very few trees. Respondents prefer to walk and take photos in the northern part of the lake, full of trees (Figure 4).

Following the spatial average distance analysis results in Table 2, the distribution pattern of the photo-taking points is clustered at certain points. We analyze the locations of each cluster's center using Kernel density analysis in ArcGIS. With Kernel density analysis, the concentration of features of the photo-

taking points from each "Cluster B," "Cluster F," and "Cluster A" were identified.

The space under the wide canopy of trees allows respondents to see through the trees. The view of the forest under the wide understorey is what causes the respondents to take many photos and focus on this location. The photo-taking points in "Cluster F" were concentrated around the deer enclosure (Figure 5-right above). Inside the deer breeding, several deer can be seen from behind bars. Respondents rarely encounter the deer daily, so they are interested and take pictures of the deer. The character of the landscape around the deer cage is surrounded by tall trees that are also interesting to the respondents. Location points of the photos taken in "Cluster A" are concentrated on the lake's northwestern banks (Figure 5-below). Only a few respondents explored the southwest, southeast, and northeast. Generally, respondents move from the entrance in the west to the north, which is filled with tall trees. During the trip, respondents took pictures of the landscape toward the body of water. The objects photographed by respondents include water, water vehicles, and reflections of things across the lake.

The research identified three objects in the "*Situ Gede Forest*" that interested respondents, including landscapes with tall trees, views of animals, and water bodies. Usually, the manager determines the potential forest elements by looking at the trend of gathering visitors. However, the method is less authentic because there is no scientific evidence of locations where visitors gather to enjoy the scenery. With the VEP and GPS tracking methods, elements of the forest landscape can be scientifically identified and then optimized as tourist attractions.

Tall trees are the main forest resource that attracts visitors. Tall trees are essential to shape the character of the forest and form the forest landscape under the forest canopy. This is consistent with (Yang et al., 2009) that the presence of large trees affects the visibility of urban forests significantly, where the use of large trees will create a greener landscape than using medium and small trees. However, this contradicts the results of studies in non-tropical forests. According to (Wang et al., 2017) Forests with medium understorey heights between very important as an attraction for recreation. The three characteristics include objects of tall trees 0.5–1.0 m or a mixture of low-medium-high understorey heights are preferred over other understorey heights. (Heyman, 2012) mentions that both the respondents prefer forests with understorey or open ones without understorey. In both understorey and open forests, understorey diversity affects the respondent's preference for forest landscapes. The difference in the type of scenery in the forest that the respondents preferred from this study in the large tropical forest to

the non-tropical forest may be due to the level of uniqueness of the landscape according to local respondents. Perhaps the type of forest with no or little understorey in Indonesia is not very common, so respondents prefer forest scenery without understorey as their preferred forest. In addition, woods without understoreys look neater, cleaner, and more comfortable for recreation, whereas tropical forests with dense understoreys usually feel damp and uncomfortable.

Animal objects and the scenery around the animal sanctuary are objects of interest to visitors. There is a deer breeding inside the site where the deer are in cages and are not released wild. The deer were attractive to respondents, so many respondents took pictures of the deer and its atmosphere. In addition, there are also wild animals, such as insects and spiders. Respondents were also interested in the animal object and took pictures of the animal object. The behavior of respondents in a forest landscape is following (Eriksson et al., 2012) wherein a forest landscape with biodiversity. Respondents tend to have a stronger intention to study plants or animals.

The object of the body of water and its mirroring effect is one of the objects most photographed by the respondents. The respondents' visual interest in objects of water bodies and their mirror effects is in accordance with (Nasar & Li, 2004) that the elements of the water landscape and the reflection of the surrounding objects are interesting sceneries for visitors. (Sugimoto, 2013; Zube et al., 1982) states that water is a significant landscape element for landscape visitors and is an essential attribute of a landscape. According to (Dramstad et al., 2006), photos containing water objects have a much higher preference value than photos without water objects.

Locations for taking photos of trees, animals, and bodies of water tend to be centralized. The photos is also located near the existing trail. According to Callau, et al (2019), the respondents' photos in VEP studies are more taken near trails than far from the trails. Based on the results of GPS tracking of all respondents, it was identified that the observation locations for objects of trees, water, and animals that were interesting to visitors had different concentrations of locations but were still near the existing trails. The respondents' photos were taken at places that tend to be the same between one respondent and another. Respondents tend to take photos in the same tree line among the many scenery choices at the site. This shows that the VEP method, which is equipped with GPS tracking, is quite effective in identifying the location of interesting forest scenery. The results from Kernel Density Analysis in the form of a raster of the density of the photo-taking points can be a good view zone, which is important to consider in planning forest tourism.

Other photos consist of objects of human



Figure 3. The landscape object of the tree line in "Cluster B" that the respondents most frequently landscape positively perceive humans than artificial objects made by humans.

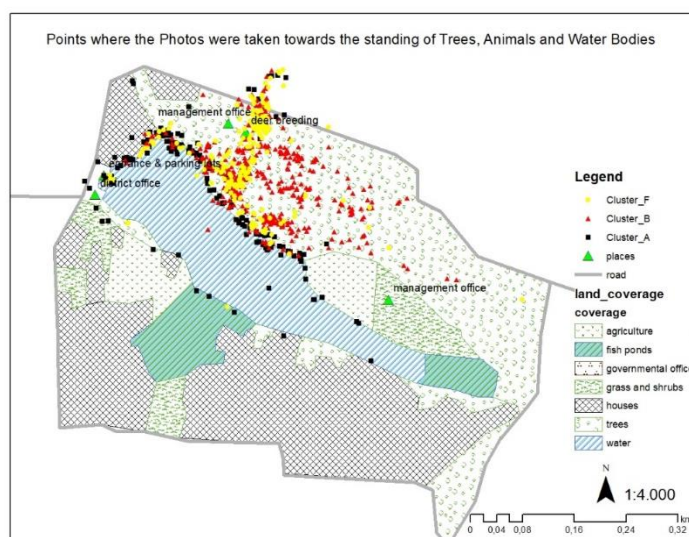


Figure 4. The Photo-taking point's location of the three clusters

This result supports Lee, et al (2022) that GIS-based VEP is beneficial to identifying visual aspects and exploring the location of preferred forest landscape views.

4. Conclusion

Three types of sceneries attract respondents visually to this study, including forests with tall trees as objects, forests with animals, and views of bodies of water. The three types of scenery were obtained through the results of qualitative and quantitative analysis of the photos taken by the respondents through the VEP method, Google Cloud Vision API, and GPS tracking. This research shows that technology 4.0 is developing and can be optimized to identify human preferences for forest landscapes and geo-locations of viewing points. This technology can present authentic evidence of humans and human movements in tourism forests, which currently tend to be subjective and difficult to identify.

Information about sceneries of interest to visitors and their observation locations is very area. These interesting objects must be preserved so visitors can still enjoy the scenery. important in planning and managing a tourist forest

Information about the location for observing interesting sceneries is actual information. It has evidence that it is valid to be considered in the placement of supporting facilities, such as signage labels, tracking paths, benches, shelters, and picnic facilities.

In this study, the theme of the photo content was identified with the help of the Vision API Google Cloud. However, this does not fully indicate the respondents' reasons for taking photos of these interesting sceneries. This is an evaluation for further research that the reasons for taking photos based on each respondent's perception of each photo content need to be obtained. For this reason, obtaining a practical and easy way to get the reasons for taking photos of the respondents is necessary. Perhaps the

use of tools in smartphone applications, which have facilities for capturing photos and writing text, can be used in further research.

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