A COMPARATIVE STUDY ON THE PERCEPTION OF FOREST LANDSCAPE USING LIST METHOD BETWEEN UNIVERSITY STUDENTS OF JAPAN AND INDONESIA

PRITA INDAH PRATIWI

GRADUATE SCHOOL
BOGOR AGRICULTURAL UNIVERSITY
BOGOR
2014
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SUMMARY

PRITA INDAH PRATIWI. Comparative Study on the Perception of Forest Landscape Using LIST Method between University Students of Japan and Indonesia. Supervised by BAMBANG SULISTYANTARA and ANDI GUNAWAN.

Forest is not only assessed for timber production, but also for public interests. It is not easy to measure the multiple functions and existence values which forests represent to local residents. People’s environmental perception, experience and attitudes could influence their affinity and preference to the local landscapes (Hanley et al. 2009; Kaltenborn & Bjerke 2002). Recently, some studies have focused on the influence of specific nature images on landscape preferences (Ribe 2002; Van den Berg & Koole 2006). The methodology using visual stimuli on landscapes photographs is still based on normative ways of seeing the landscape in western countries, while landscape visual evaluation in non-western countries is rarely investigated. Based on previous research regarding landscape preference (Pratiwi 2013), both students of Japan and Indonesia distinguished their landscape preference into 25 photos of lake, river, wetland, and forest landscape, meanwhile, their landscape exoticism was put into 48 photos of various landscape types. By externalizing landscape image directly as visual information, the variation of students’ perception could be understood that it might encourage the preference differences in the way of seeing the landscape. Because there were differences in perception of seeing landscapes, it was necessary to classify landscape image aspects of Japanese and Indonesian students using LIST, to study internal factors that influence the perception, and to formulate the differences of forest landscape characters.

The study was conducted in three stages, namely, 1) landscape image survey, 2) landscape image analysis, and 3) forest landscape interpretation. LIST method was applied to classify landscape image aspects. Chi-square test was applied to examine the significant differences between students of Japan and Indonesia in perceiving forest landscape, while cluster analysis was applied to characterize forest landscape. The results showed that 10 prominent components were detected in both countries. In landscape image of Japan, prominent components were identified by trails, people, needle leaf forest, surrounding place, and recreational space. In landscape image of Indonesia, prominent components were identified by understory plant, broadleaf forest, sideways view, forest structure, and scenic view. Factors influencing perception consisted of gender, age, past landscape type, present landscape type, past urbanization level, present urbanization level, and experience of journey. The only attribute influencing perception for Indonesian students was gender. Japanese students distinguished forest type into needle leaf, broadleaf and unknown forest type, while Indonesian students distinguished forest type into broadleaf and unknown forest type. The result of this study might be useful as guidance for forest landscape design in Japan and Indonesia.

Keywords: Chi-square test, cluster analysis, forest, LIST, perception
RINGKASAN

PRITA INDAH PRATIWI. Studi Perbandingan Persepsi pada Lanskap Hutan Menggunakan Metode LIST antara Pelajar Jepang dan Indonesia. Dibimbing oleh BAMBANG SULISTYANTARA dan ANDI GUNAWAN.

Hutan tidak hanya dinilai untuk produksi kayu saja, tetapi juga untuk kepentingan umum. Ini tidak mudah untuk mengukur beragam fungsi dan nilai-nilai eksistensi yang hutan berikan bagi penduduk lokal. Persepsi lingkungan, pengalaman, dan sikap manusia dapat mempengaruhi afinitas dan preferensi mereka terhadap lanskap lokal (Hanley et al. 2009; Kaltenborn & Bjerke 2002). Akhir-akhir ini, beberapa penelitian telah berpusat pada pengaruh gambar alam tertentu terhadap preferensi lanskap (Ribe 2002; Van den Berg & Koole 2006).

Metodologi menggunakan rangsangan visual pada lanskap foto masih didasarkan pada cara-cara normatif dalam melihat lanskap di negara-negara barat, sedangkan evaluasi lanskap visual di negara-negara non-barat jarang diselidiki. Berdasarkan penelitian sebelumnya mengenai preferensi lanskap (Pratiwi 2013), pelajar Jepang dan Indonesia membedakan preferensi lanskap ke dalam 25 foto lanskap danau, sungai, lahan basah, dan hutan, sementara itu, eksotisme lanskap dimasukkan ke dalam 48 foto berbagai jenis lanskap. Dengan mewujudkan gambar lanskap secara langsung sebagai informasi visual, variasi persepsi pelajar dapat dipahami bahwa hal ini dapat mendorong perbedaan preferensi dalam cara melihat pemandangan. Karena terdapat perbedaan persepsi melihat lanskap, hal ini dianggap perlu untuk mengklasifikasikan aspek gambar lanskap dari pelajar Jepang dan Indonesia menggunakan LIST, untuk mempelajari faktor-faktor internal yang mempengaruhi persepsi, dan merumuskan perbedaan-perbedaan karakter lanskap hutan.

Penelitian dilakukan dalam tiga tahap, yaitu 1) survei gambar lanskap, 2) analisis gambar lanskap, dan 3) interpretasi lanskap hutan. Metode LIST diterapkan untuk mengklasifikasikan aspek gambar lanskap. Uji Khi-kuadrat digunakan untuk menguji perbedaan yang signifikan antara pelajar Jepang dan Indonesia dalam mempersepsikan lanskap hutan, sedangkan analisis gerombol digunakan untuk mengkarakterisasi lanskap hutan. Hasil penelitian menunjukkan bahwa 10 komponen penting terdeteksi di kedua negara. Pada gambar lanskap Jepang, komponen penting diidentifikasi oleh jalan setapak, orang, hutan berdaun jarum, surrounding place, dan ruang rekreasi. Pada gambar lanskap Indonesia, komponen penting diidentifikasi oleh tanaman understory, hutan berdaun lebar, sideway view, struktur hutan, dan scenic view. Faktor-faktor yang mempengaruhi persepsi terdiri atas jenis kelamin, usia, tipe lanskap masa lalu, tipe lanskap sekarang, tingkat urbanisasi masa lalu, tingkat urbanisasi sekarang, dan pengalaman perjalanan. Satu-satunya atribut yang mempengaruhi persepsi bagi pelajar Indonesia adalah jenis kelamin. Pelajar Jepang membedakan jenis hutan ke dalam daun jarum, berdaun lebar dan unknown forest, sedangkan pelajar Indonesia membedakan jenis hutan menjadi berdaun lebar dan unknown forest. Hasil penelitian ini dapat berguna sebagai pedoman untuk desain lanskap hutan di Jepang dan Indonesia.

Kata kunci: uji Khi-kuadrat, analisis gerombol, hutan, LIST, persepsi
A COMPARATIVE STUDY ON THE PERCEPTION OF FOREST LANDSCAPE USING LIST METHOD BETWEEN UNIVERSITY STUDENTS OF JAPAN AND INDONESIA

PRITA INDAH PRATIWI

Thesis
as a requirement to obtain degree
Master of Science
in
Landscape Architecture Program

GRADUATE SCHOOL
BOGOR AGRICULTURAL UNIVERSITY
BOGOR
2014
The Examiner of External Commission: Dr Ir. Aris Munandar, MS
Title of Thesis: A Comparative Study on the Perception of Forest Landscape Using LIST Method between University Students of Japan and Indonesia

Name: Prita Indah Pratiwi
Index Number: A451110171

Approved by
Supervisor Commission

Dr Ir Bambang Sulistyantara, MAgr
Chairman

Dr Ir Andi Gunawan, MAgrSc
Member

Known by
Head of Landscape Architecture Program

Dean of Graduate School

Dr Ir Nizar Nasrullah, MAgr

Dr Ir Dahrul Syah, MScAgr

Date of Defense: Date of Graduation:
FOREWORD

First, the author gives the praise and gratitude to Allah for all his gifts, thus the thesis entitled A Comparative Study on the Perception of Forest Landscape Using LIST Method between University Students of Japan and Indonesia could be completed. Landscape image sketches revealed different way of seeing landscape between respondents in Japan and Indonesia through individual perception. This methodology could be useful in understanding different assumptions regarding environmental issues, not only for a global environmental discussion, but also for local environmental planning and design through public participation.

The author thanks to:
1. Dr Ir Bambang Sulistyantara, M Agr and Dr Ir Andi Gunawan, M Agr Sc as supervisor at Bogor Agricultural University for the great advice and guidance in completion of this thesis.
2. Katsunori Furuya PhD as supervisor at Chiba University for the kind support in this intercultural research of landscape preference and perception.
3. Dr Ir Aris Munandar, MS as the examiner of external commission for the suggestion and additional input of this thesis
4. Dr Ir Nizar Nasrullah, M Agr as the head of Landscape Architecture Program for the motivation and advice in completion of this thesis
5. Dr Bagus Sarton, S Si, M Si for the help and guidance in statistical data interpretation
6. Parents, Ir Eddy Soliyadi and Ir Keni Kenranikanti, and little brother, Miladio Rizky Prabowo for the prayer, support, and big motivation.
7. Undergraduate and graduate students of Landscape Architecture Program at Bogor Agricultural University and Division of Environmental Science and Landscape Architecture at Chiba University as respondents and good friends for the help, support, and kindness.

Bogor, June 2014

Prita Indah Pratiwi
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1 PREFACE

Background

In the recent years, the world’s forests have been affected by overharvesting, over-grazing, pests and diseases, high global temperatures, floods, droughts, storms, air pollution and forest fires, as well as economic crisis in Asia and other regions leading to an overall decrease in the world’s forest cover. The forests in Asia in particular have been strongly affected (Inoue 2003). A number of initiatives have suggested forest policy reforms and the need for the sustainable forest management has been widely recognized and encouraged. As Schmithüsen (1995) described, the lack of consensus on a balance among global, national and local demands becomes a major obstacle for the advancement of international cooperation in forest policy. Local socio-cultural background is often ignored by global discussion (Rannikko 1999; Marsden 2003; Finger-stich 2005). Whereas in the interest of sustainable forest management, forest is no longer assessed only for timber production, but also for public interests (Kleiman and Wolf, 2007), such as amenity, tourism, conservation, even nature’s health service (Knight 2000; Li et al. 2006).

It is crucial that people effectively participate in forest planning and management to measure the multiple functions and existing values that forests represent to local residents. Public participation methods reflect the local conditions, carry a lower cost than other approaches, and they are the key to unlock this situation even in developed countries (Fujiwara 2003). Although Indonesia has high biodiversity (Whitten and Whitten 1992 in Cochrane 2006) and a substantial network of national parks and other protected areas (FAO 1982 in Cochrane 2006), most developing countries can’t solve the problem of limited management resources and high cost derived from scattered sites complicated by the diverse interests of multiple parties in forest management (Fujiwara 2003). Sutton (2008) explained that most famous natural sights in Japan such as Matsushima or the Fuji area have been exploited either by economic progress or poor local management. Japan has struggled to define and redefine the boundaries between preservation and exploitation of forest in recent decades, therefore all countries, regardless of the level of economic development, could adopt public participation methods to keep nature.

Many cognitive approaches to landscape studies discuss the structure of the human response to forest landscape and focused on people’s interpretation and understanding of the perceived landscape (Swaffield and Foster 2000; Karjalainen and Tyrväinen 2002). Landscape preference research has been conducted by using methods such as scoring photographs, Semantic Differential (SD) methods, interviews, drawings or cognitive maps to find a functional model of the human cognitive and value systems in several dimensions (Zube et al. 1982). Recently, some studies have focused on the influence of specific nature images on landscape preferences (Ribe 2002; Van den Berg and Koole 2006). The methodology using visual stimuli on landscapes photographs is still based on normative ways of seeing the landscape in western countries, while landscape visual evaluation in non-western countries is rarely investigated.
Based on previous research regarding landscape preference (Pratiwi 2013), both students of Japan and Indonesia distinguish their landscape preference into 25 photos including forest landscape as one of them, meanwhile their landscape exoticism was put into 48 photos of various landscape types. In order to assess various values within forest globally, it is necessary to understand the meaning of the forest, especially in Japan and Indonesia as Asian country. In Japan and Indonesia, people may prefer different parts or different types of forests. The same type of forest may have different meanings and interpretations within each cultural framework. The general hypothesis is that there is a significant difference between students of Japan and Indonesia towards forest landscape, and there is a relationship between students’ attributes and forest landscape.

**Formulation of Problem**

With the increase of global discussion regarding the natural environment, an understanding of different meanings of natural environment is important for local participatory environmental management and cross-national cooperation. The difference of various perceptions and interpretations of forests through understanding two countries’ perception and preference of environment might become a precondition of discussion for future cooperative environmental management (Figure 1):

1. What are people looking at and how do they view forest
2. What is the difference between each country in the way of seeing forest
3. How is the relationship between students’ attributes and forest landscape
4. What kind of characters of perception-based forest landscape

---

**Figure 1 Diagram of mind frame**
Objectives of Research

Because of the differences in perception of seeing landscapes, it is necessary to classify landscape image aspects of both students using LIST, to know student’s attributes that may influence perception, and to formulate the differences of forest landscape characters.

Benefit of Research

The result of this study might be useful as a guidance for forest landscape design in both countries-Japan and Indonesia. Good design guidance could protect and sustain one of the most precious natural resources of both countries from becoming exploited and exhausted.

Scope of Research

The scope limits of the research included the scope of research and research object. The scope of research was limited to the study of visual data (landscape image sketch of forest), verbal data (key words and text of forest), factors influencing perception, and the characters of perception-based forest landscape. The scope of research object was students’ memory of forest landscape.

2 LITERATURE REVIEW

Perception and Preference

Perception is an image, understanding, and interpretation of a person to an object, especially how people connect obtained information from the environment. The perception form is different from one to another because of the influence of intellectual background, emotional experience, relationship, and attitude. Meanwhile the depth of perception will be proportional to the increasing number of intellectual depth and emotional experience experienced by a person (Eckbo 1964). Furthermore, Porteous (1977) adds that the perception will determine someone’s actions on the environment. One of the observed objects is landscape in which someone will perceive the landscape that has been observed (Nasar 1988). Someone's perception of landscape quality is determined by strong interaction between landscape variables and knowledge of a person towards the landscape. The result of the assessment is good or not good. The level of the assessment depends on the satisfaction of someone's feelings towards the landscape.

People’s attitude in evaluating landscape was driven by their perception initiated by stimulus (Blake and Sekuler 2006). Referring to Ueda (2009), landscape perception was defined as landscape image, which is a medium between one’s individual values and social construction as well as physical
landscape and landscape representation. By externalizing landscape image directly as visual information, the variation of students’s perception could be understood that it might encourage the preference differences in the way of seeing the landscape. Preference is determined by many factors as part of the decision-making process. Factors affecting people’s preference towards an object or landscape visual quality are determined by object or quality of the landscape and the observed psychological state of society. According to Laurie (1990), the personal attributes affecting human perception and preference of the environment are age, social level, cultural background, past experiences, and one's routine activities. In their application of human perception and preference, decision-making of landscape science can be found in many activities such as decision-making in visual landscape assessment.

**Fukei Theory**

The basic idea of this research derives from Lynch’s ‘The Image of the City’ (Lynch 1960). The image of the environment claims that in cities, “every citizen has had long associations with some part of the city, and his image is blended in his memories and meanings”. There are important elements in the built structure of city for perception of the city. Lynch (1960) defines those three components of an environmental image: identity, structure, and meaning. Identity refers to one’s identity, not equality with something else. Structure is the spatial pattern and relationship of the object to the observer and to other surrounding objects. According to the observer, meaning is a complex practical and emotional relationship, which is not as easily influenced by physical manipulation as the other two components. Thus, observer with different cultures social, nature experience, background may vary the way of seeing the landscape significantly.

In contrast, Nakamura (1982) in Ueda (2012) suggests that landscape image concept that can be regarded as a section of Lynch’s environmental image is perceived from a particular viewpoint that points self-orientation in the environment. He explains landscape of fukei in a Japanese sense as a phenomenon with five characteristics: views, knowledge, orientation, place-network and generation. View is a limited spatial landscape in the sight of a person standing on the ground. Knowledge is a representation of linguistic elements. Orientation is the position of a person-environment relationship in the environment which located personal values of landscape. Place-network is a setting of experiences and an accumulation of the consequences. Generation is the agent of change in fukei phenomenon. In this regard, the main focus of fukei is a way of seeing the landscape to recognize a place. Fukei phenomenon is a basic process in which the latent structure of place is broken down with the help of spatial view, linguistic knowledge and subject’s self-orientation through time creating a new value (Nakamura 2001 in Ueda 2012). Referring to this definition, fukei can be positioned as a transformation from landscape to place (Figure 2), in which spatial view, linguistic knowledge and subject’s self-orientation play an important role for value creation.
Landscape Image

Lynch’s environmental image and Nakamura’s idea of landscape image have common points. Emphasizing on it, they try to describe the idea of landscape image as a core concept of an empirical methodology. Landscape image consists of the spatial and semiotic aspects of the landscape. Ueda et al. (2012) stated that the combination of Nakamura's view and knowledge is in line with Lynch's identity in terms of the process to create the landscape. The two aspects of the landscape image are called spatial view and linguistic knowledge. The main role of landscape image is to relate the subject to the environment and to test people’s attitude and intention. The representative standpoint in the structure of the relationship between people and environment is called self-orientation. Furthermore, experience and communication in social group creating the relationship of place and network are in line with public image. We can see that both interaction of spatial view and linguistic knowledge and the integrating process of individual self-orientation and social meaning are proceeded through observer’s experience and communication as a temporal change, namely, generation. The communication is mediated by a landscape through spatial view and linguistic knowledge. At the same time, landscape image is formulated within a certain cultural framework and it normalizes individual perception and social construction (Figure 3).

Landscape image includes spatial and semiotic aspects of landscape (spatial view and linguistic knowledge) and individual and social aspects (self-orientation and social meaning). Landscape image as a central part in the square model, comprises all of the elements. Based on this theoretical definition, Nakamura and Ueda observe meaning of forest empirically by applying this methodology of landscape image to externalize the landscape image as a subjective way of seeing the landscape.
Landscape Image Sketching Technique (LIST)

Landscape Image Sketching Technique (LIST) consists of a combination of a brief sketch of various landscape, keywords referring to landscape, and short verbal description of landscape done by respondents (Ueda 2009). This method could represent one’s view towards spatial environment and linguistic value orientation. Nakamura (1982) in Ueda (2012) explained the most distinctive character of LIST is the analysis of visual data of a scenic sketch. The drawing sketch is a kind of representation of one’s landscape image which can be interpreted with some main elements like mental mapping based on the classic idea of gestalt psychology. Ueda also emphasized that the three phases have four Fukei conditions: 1) identification of landscape elements (through spatial view and linguistic knowledge), 2) structure of person-environment relationship (as self-orientation), and 3) the meaning (intersubjective values) of place according to how one’s intentions are interpreted.
3 METHODS

Object and Time of Research

The object of the research was student’s memory of forest landscape. In order to take the perception of forest landscape among different people, university students of Chiba University and Bogor Agricultural University were selected as respondents. Chiba University is located in Matsudo, Chiba Prefecture, next to Tokyo Metropolitan Area, while Bogor Agricultural University is located in Bogor, West Java Province (Figure 4). The survey was taken place during February until April 2013. The analysis and interpretation started from December 2013 until February 2014. The students’ attributes in each country are described in Table 1.

Data Collection and Sampling

Nowadays, the context of the multiple values of forests, especially for conducting LIST, involves not only merely experts, but also students (Ueda 2006; Pratiwi et al. 2013) and general society or local residents (Ross and Wall 1999; Ueda 2009). The sampling method applied in this research was non-random sampling technique (purposive sampling) in which the sample selection used the criteria below. The first criterion of respondents selected was independent respondents who were not influenced by the experience of visit to Japan or Indonesia. The second criterion of students was as the nature observer who had studied basic of Environmental Science and experienced within forest. Their educational history has a major influence on environmental attitudes (Takayama 2013).
### Table 1: Students' characteristics

| Attributes                        | Japan | Indonesia |
|-----------------------------------|-------|-----------|
| **Gender (%)**                    |       |           |
| Male                              | n= 55 | n= 50     |
| Female                            | 60    | 58        |
| Male                              | 40    | 42        |
| **Age (years old)**               |       |           |
| Mean                              | 22.53 | 22.34     |
| **Academic experience (%)**       |       |           |
| Undergraduate                     | n= 55 | n= 50     |
| Graduate                          | 58.18 | 66        |
| Postgraduate                      | 41.81 | 34        |
| **Major (%)**                     |       |           |
| Technical                         | n= 55 | n= 50     |
| Natural Science                   | 0     | 6         |
| Humanities                        | 90.90 | 94        |
| Other                             | 5.45  | 0         |
| **Occupation (%)**                |       |           |
| Student                           | n= 55 | n= 50     |
| Lecturer                          | 100   | 94        |
| Other                             | 0     | 2         |
| **Present urbanization level**    |       |           |
| City center                       | n= 55 | n= 48     |
| Urban area                        | 5.45  | 6.25      |
| Sub urban area                    | 47.27 | 29.17     |
| Rural area                        | 47.27 | 64.58     |
| **Present landscape type**        |       |           |
| Plain                             | n= 55 | n= 50     |
| Mountain                          | 78.18 | 56        |
| Coastal                           | 0     | 2         |
| Basin                             | 9.09  | 0         |
| Other                             | 12.73 | 0         |
| **Past urbanization level**       |       |           |
| City center                       | n= 55 | n= 42     |
| Urban area                        | 3.64  | 4.76      |
| Sub urban area                    | 20    | 28.57     |
| Rural area                        | 65.45 | 40.48     |
| **Past landscape type**           |       |           |
| Plain                             | n= 55 | n= 50     |
| Mountain                          | 60    | 72        |
| Coastal                           | 20    | 10        |
| Basin                             | 9.09  | 20        |
| Other                             | 9.09  | 0         |
| **Experience of journey (%)**     |       |           |
| Japan                             | n= 55 | n= 50     |
| Indonesia                         | 47.27 | 4         |
| Other country                     | 3.64  | 92        |
| Japan                             | 83.63 | 14        |

According to Gay and Diehl (1992) in Wiyadi (2009), a very acceptable sample size depends on the type of research, namely: 1) the sample size of descriptive research at least 10% of the population, 2) the sample size of correlational research at least 30 subjects, 3) the sample size of causal-comparative research at least 30 subjects for each group, and 4) the sample size of experimental research at least 15 subjects for each group. This was in line with Fraenkel and Wallen (1993) in Wiyadi (2009). Roscoe (1975) in Wiyadi (2009) provides the guidance to determine the sample size, namely: 1) in each research,
the sample size approximately 30 to 500 subjects, 2) the sample size at least 30 subjects for each parts. This research examined the significant difference between Japan and Indonesian students to perceive forest landscape, the relationship among students’ attributes and forest landscape, and forest landscape characters in both countries. The determination of sample size in this research was 105 students (55 students from Chiba University and 50 students from Bogor Agricultural University). The students consisted of undergraduate and graduate students of Landscape Architecture and Environmental Science. In the terms of sample size, the number of students was sufficient, because the research sample or research object for each country was more than 30 respondents as expressed by Gay and Diehl (1992), Roscoe (1975), and Fraenkel & Wallen (1993) in Wiyadi (2009).

Data Analysis Procedure

The data was obtained through survey using questionnaire and tested to 105 university students (55 students from Chiba University and 50 students from Bogor Agricultural University) using Landscape Image Sketching Technique (LIST). The questionnaire was arranged using their native language for equal understanding of questionnaire as research instrument and filled out by students using pen to avoid systematic error. LIST is one of the effective methods to analyze the meaning of environment. Based on Lucas (1991) and Ueda (2010), research procedure for developing design concept consists of landscape image survey, landscape image analysis, and forest landscape interpretation (Figure 7).

Landscape Image Survey

1. Key words and text of forest

The students were asked to imagine forest to recall and recollect the imagery from their memory. Then, the students gave some keywords relating to forest and explained the situation within forest based on the words they made with short verbal description of their forest image. This part was the first step in conducting LIST method described in Ueda (2006, 2009, 2010), Ueda et al. (2012), and Mizuuchi et al. (2013).

2. Landscape image sketch of forest

The same students drew a brief sketch of their forest image (Figure 5). Generally, the meaning of the environment might be only interpreted through verbal description. Using landscape image sketch, it is expected as a method to fulfill the inconsistent verbal data.

Figure 5 An example of landscape image sketch
3. Students’ attributes

Related to the LIST, some students’ attributes were necessary to be asked, namely, gender, age, past landscape type, present landscape type, past urbanization level, present urbanization level, and experience of journey. As Takayama (2013) suggested, these possible factors may lead to differences in environmental attitudes between research sites in Japan and Indonesia. It was expected that landscape types of home base with some physical changes of forest expressed the relationship with their perception.

Landscape Image Analysis

1. Analysis of visual and verbal data

Visual and verbal data were analyzed in three phases of LIST. The analysis was implemented onto four fukei conditions (landscape image aspects), namely, identification of landscape elements (through spatial view and linguistic knowledge), structure of person-environment relationship (through self-orientation), and the meaning of place (through social meaning). This method provides new insights into the understanding of public image through landscape perception (Ueda 2010).

Linguistic knowledge. Landscape elements were labelled verbally and identified visually: understory plant, terrain, trail, creature, water, artificial object, people, and sky. At the first step, landscape element was identified relating to the words and shapes selectively. Furthermore, according to landscape element, the types of forest in Japan and Indonesia could be classified into mixed forest, needle leaf forest, broadleaf forest, unknown forest, and fallen tree type.

Spatial view. View angle and distance were classified visually according to the visual appearance of each landscape element. The represented visual appearance of each landscape element could be understood in terms of view angle and distance indicating which part of landscape was captured from certain viewpoint. For landscape image sketch of forest, the size of tree symbols and texture were classified into four groups: close-up, sideway, bird eye, and distant view.

Self-orientation. The relationship between various elements and viewpoint showed visually the way of perceiving self-orientation in represented landscape image sketch belonging to the students. This relationship reinforced the representation of a person–environment relationship. The results were classified into four groups: single object, objective scene, surrounding place, and scenic place.

Social meaning. The meaning of the forest was interpreted visually and verbally in relation to landscape element and self-orientation. This personal meaning showed the meaning of landscape as a place with various interests. The pattern of landscape image of certain social group was categorized into eight groups: forest structure, scenic view, recreational space, symbolic place, ecological system, forestry operation, and lifeworld.

After having collected, each landscape image sketch was classified into landscape image aspects using checklist method. The presence of the variables in the landscape image sketches was defined as ‘1’, while ‘0’ indicated the absence of the variables in the landscape image sketches (Figure 6 and 7). Then, chi-square test was applied to analyze the significant differences between students of
Japan and Indonesia in perceiving forest landscape. The only significant variable at $p<0.05$ was discussed to characterize the landscape images in Japan and Indonesia. Statistical calculation which was applied to test the significant difference between students of Japan and Indonesia towards forest landscape used formula of chi-square as follows:

$$\chi^2 = \sum_{i,j}^{r,k} \left( \frac{(o_{ij} - e_{ij})^2}{e_{ij}} \right)$$

Where:
- $r$ : number of rows
- $k$ : number of column
- $o_{ij}$ : observed frequency of the $i$-th row $j$-th column
- $e_{ij}$ : expected frequency of the $i$-th row $j$-th column

Figure 6 Diagram of landscape image, its aspects and variables

2. Analysis of factors influencing perception
The purpose of this analysis was to examine the relationship among students’ attributes and forest landscape. The questionnaire consisted of 7 variables, namely, gender, age, past landscape type present, landscape type, past urbanization level, present urbanization level, and experience of journey. Chi-square test was applied to examine their relationship.

3. Cluster analysis of perception
Having been classified into landscape image aspects, then the data consisting of 28 variables of landscape image aspects was analysed using cluster analysis (Table 2). Cluster analysis using Wards method and Jaccard similarity index was applied to characterize forest landscape. Jaccard’s coefficient is measurement of asymmetric information on binary variables based on the presence and absence of data and is calculated as the mean of the clusters (He and Barclay 2000). The negative value and non-existence are not counted in this case,
so Jaccard similarity index will not represent double absence. The cluster analysis step was conducted as follows (Supranto 2010): 1) defining problem, 2) choosing measure of distance, 3) selecting clustering procedure, 4) considering the number of cluster, and 5) interpreting profile of cluster.

| Table 2 Variables of landscape image |
|--------------------------------------|
| **Linguistic Knowledge**             |
| **Landscape Element**                |
| **Forest Type**                      |
| **Spatial View**                     |
| **Self Orientation**                 |
| **Social Meaning**                   |
| Understory plant                     | Mixed forest type | Close-up view | Single object | Forest structure |
| Terrain                              | Needle leaf forest| Sideway view  | Objective scene| Scenic view      |
| Trail                                | Broadleaf forest  | Bird eye view | Surrounding place| Recreational space|
| Creature                             | Unknown forest    | Distant view  | Scenic place    | Symbolic place   |
| Water                                | Fallen trees      |               |                | Ecological system|
| Artificial object                    |                   |               | Forestry operation|
| People                               |                   |               | Lifeworld       |
| Sky                                  |                   |               |                |                  |

**Forest Landscape Interpretation**

There were four types of basic elements or building blocks within forest: volume (three-dimensional), plane (two-dimensional), line (one-dimensional), and point which has significant position, but almost no dimension. These elements can vary in a number of ways (variable) including size, shape, number, position, direction, interval, texture, color, visual force, time, and lighting. Because the variety of possible combinations and its overall effect are complex, the ways of organizing elements and variable (organizational factors) are needed. Organizational factors can be used to group elements, for example nearness, while others such as rhythm, balance, scale, and tension are used to give overall structure to a design. Forest landscape interpretation in Japan and Indonesia was formulated and derived from cluster analysis. The differences of forest landscape characters were considered through the important principles of forest landscape design including shape, visual force, scale, diversity, and unity (Lucas 1991). The output of interpretation would be forest landscape characters that might be useful as guidance for forest landscape design in Japan and Indonesia.
Figure 7 Diagram of framework
4 RESULTS AND DISCUSSION

Classification of Landscape Image Aspects

Linguistic knowledge

Visible landscape elements in the image sketches were labelled first (Table 3 and Figure 8). Forests have multiple layers of understory species including sub canopy or lower tree layer such as smaller trees or sapling, shrub layer such as woody plant (shrub, small pygmy trees, liana, vine), herb layer such as herbaceous plant (non-woody flower, fern, grass), and groundcover were labelled as understory plant (Longman and Jenik 1974; He and Barclay 2000). Mammals, birds, and insects were collectively labelled as creature, while river, pond, and lake were labelled as water, and mountains, hills, and various type of landform were labelled as terrain. Trail covered the ground track with wild grass, bordered by stones or man-made track like stairs. Artificial thing included man-made element such as house, shrine, gate, and car. The students drew themselves and other people in the image sketches, therefore, component of people was added. In addition, the sun, cloud, moon and star as sky were added to the linguistic knowledge variables (Ueda 2012).
As a result of statistical analysis, the probability value of understory plant (0.000), trail (0.003), and people (0.000) was less than $\alpha=0.05$. Therefore, it could be concluded that there is significant difference between students of Japan and Indonesia in perceiving forest landscape, especially in understory plant, trail, and people variables (Figure 9). It reflected their culturally different ways of representing understory plant. In Indonesian sketches, there were so many types of understory plant such as flowers, fallen leaves, spices plants, medicine plants, and underbush, while in Japanese sketches, there were only underbush and fallen leaves. In Japanese sketches, the trail and people’s position were depicted inside forest.

### Table 3 Landscape element per country (%)

| Country | Understory plant | Terrain | Trail | Creature | Water | Artificial Object | People | Sky |
|---------|------------------|---------|-------|----------|-------|-------------------|--------|-----|
| Japan   | 43.64            | 21.82   | 30.91 | 27.27    | 17.14 | 5.45              | 29.09  | 9.09|
| Indonesia | 82               | 32      | 8     | 26       | 36   | 4                 | 0      | 4   |

$x^2$-value

| $x^2$-value | 16.345 | 1.388 | 8.591 | 0.022 | 0.125 | 0.122 | 17.16 | 1.091 |

Sig

| Sig | 0.000*** | 0.239 | 0.003*** | 0.883 | 0.724 | 0.727 | 0.000*** | 0.296 |

Note: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$
Forest type in image sketches was labelled and calculated (Table 4). Forest type was classified into mixed forest, needle leaf forest, broadleaf forest, unknown forest, and fallen trees type according to the shape of tree symbols (Figure 10). A mixed forest type consisted of various tree symbols representing conifers and broad leaf trees. Some students drew multiple tree symbols with various height to represent a mixed forest. A needleleaf forest type consisted of single type of tree symbol in christmas tree or conifer shape, while broadleaf forest type was represented by rounded tree shape. In contrast, some image sketches were shown as only silhouette of mountains, the trunks or branch of trees, and the forest type in distant view. It was difficult to judge them, therefore, they were classified into unknown forest type. Furthermore, some image sketches included cuts off and stumps on the forest floor were called as fallen tree type.

Through this research, students were specifically asked to draw their forest image which the represented tree types often reflected the local dominant landscape. For example, in Indonesia, some image sketches of high trees with the biodiversity reflected the tropical broadleaf forest type, while Japanese coniferous plantations reflected the actual landscape of man-made needle leaf forest type (Figure 11). The image sketches do not always reflect the actual landscape and local native vegetation, but imply the subject’s cultural perspective of the forest (Ueda 2012).

Figure 10 Classification of forest type. From left to right and top to bottom: mixed forest, needle leaf forest, broadleaf forest, unknown forest, fallen trees
As a result of statistical analysis, the probability value of needle leaf (0.003) and broadleaf forest type (0.025) was less than $\alpha=0.05$. Therefore, it could be concluded that there is significant difference between students of Japan and Indonesia in perceiving forest landscape, especially in needle leaf and broadleaf forest type variables. Nine Japanese students (16.36%) drew needleleaf forest type, while 30 Indonesian students (60%) tended to place a single type of tree symbols as a ‘broadleaf forest’. The fallen trees represented students’ perception of exploited nature and ecosystem, but the results showed insignificant difference between Japanese and Indonesian students.

| Country | Mixed forest | Needleleaf forest | Broadleaf forest | Unknown forest | Fallen trees |
|---------|--------------|-------------------|-----------------|----------------|-------------|
| Japan   | 14.55        | 16.36             | 38.18           | 30.91          | 0           |
| Indonesia | 12          | 0                 | 60              | 26             | 2           |

| $\chi^2$-value | 0.147 | 8.949 | 4.991 | 0.309 | 1.111 |
| Sig           | 0.702 | 0.003** | 0.025** | 0.578 | 0.292 |

Note: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

Figure 11 Forest types per country

Spatial view

The view of landscape image sketches reflected the distance and viewing angle of the subject. According to Ueda (2012), the texture and size of tree symbols, the distance of a landscape image was categorized into short, medium and long distance. Short distance consists of close-up view which the texture and color are clearly recognized. Medium distance consists of sideway and bird's-eye view which visualizes the landscape form generally. Long distance consists of distant view which is dominated by horizon. Consequently, the view of landscape image was classified into close-up, sideway, bird eye, and distant view (Figure 12).

The close-up view is represented by the trunks or branch of the trees showing in the near distance. Through this distance, the texture of leaves, bushes, small animals can also be seen, however, outside scenery can not be seen sclearly.
The sideway view is represented by whole tree shapes which usually imply the forest structure, the section of forest, forest fringe, or vegetation composition of forest. Bird eye view is represented by the trees positioned above and wide expanse of the forest including landscape element and people on the ground that can be seen from the top. The distant view is represented by shape of mountains without any tree symbols, hence, we can not recognize the shape, size, color, even type of trees. The view of landscape image sketches was labelled and calculated (Table 5).

As a result of statistical analysis, the probability value of sideway view (0.009) was less than $\alpha=0.05$. Therefore, it could be concluded that there is significant difference between students of Japan and Indonesia in perceiving forest landscape, especially in sideway view variables. From Figure 13, in Indonesia, sideway view was the major variable followed by bird eye, close-up, and distant view. Indonesian students viewed forest as a section, forest fringe, or vegetation composition. In contrast, Japanese students viewed forest with human attributes in close-up view which slightly characterized Japanese image sketches.

Table 5 Spatial view per country (%)

| Country | Closeup view | Sideway view | Bird eye view | Distant view |
|---------|--------------|--------------|---------------|--------------|
| Japan   | 27.27        | 30.91        | 27.27         | 14.55        |
| Indonesia | 12          | 56           | 24            | 8            |
| x2-value | 3.818        | 6.733        | 0.147         | 1.109        |
| Sig     | 0.051*       | 0.009***     | 0.702         | 0.292        |

Note: *p < 0.1, **p < 0.05, ***p < 0.01
Self-orientation

The orientation of people-environment relationship was analyzed from the combination of the landscape elements and the viewpoint in the sketches. Subject’s activities and their accessibility to the forest could be recognized by spatial continuity from the viewpoint or setting of the standpoint, such as trail, vehicle, and house. Whereas forest description as objects in a scene implied the separation between forest and subject’s viewpoint. The landscape element, subjects, even creature, are sometimes drawn in the scene. Moreover, Ueda (2012) explained that the fundamental person–environment relationship does not necessarily relate to the verbal descriptions of forest, because the linguistic description explains the forest objectively, but the visual landscape image sketches reveal how the people relate the other elements in the forest image. Then, the objects in the forest landscape and the descriptions of activities were classified into four groups, namely, single object, objective scene, surrounding place, and scenic place (Figure 14).

Single object is an extracted figure from the landscape. The single element or cluster of the elements is being focused on and objectified. Objective scene is based on the placement of depicted various elements that constructing a place as scenery. It represents a relationship among landscape elements without spatial continuity from the viewpoint. In contrast, surrounding place is an expression of the students’ own standpoint in the forest. Trail, vehicle, and house are drawn in the centre of the frame in which they describe the people's activities in natural surroundings. Scenic place is a prospect from a short, medium or long distance viewpoint outside forest, typically an expression of natural surroundings from the subject's standpoint that can be seen as a combination of objective scene and viewpoint on the sketch (Ueda 2009).
Figure 14 Classification of self-orientation. From left to right and top to bottom: single object, objective scene, surrounding place, scenic place

As a result of statistical analysis, the probability value of surrounding place (0.002) was less than $\alpha=0.05$ (Table 6). Therefore, it could be concluded that there is significant difference between students of Japan and Indonesia in perceiving forest landscape, especially in surrounding place variable. Surrounding place characterizing Japanese image sketches reflected the number of people for recreational or religious activities. Meanwhile, scenic place slightly characterized Indonesian image sketches including objective scene with certain viewpoint (Figure 15).

Table 6 Self-orientation per country (%)

| Country  | Single object | Objective scene | Surrounding place | Scenic place |
|----------|---------------|-----------------|-------------------|-------------|
| Japan    | 40            | 16.36           | 32.73             | 10.91       |
| Indonesia| 48            | 20              | 8                 | 24          |

$\chi^2$-value: 0.681, 0.234, 9.669, 3.16

Sig: 0.409, 0.629, 0.002***, 0.075*

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$
The three aspects of landscape image above were reconstructed to outline the social meaning of a forest using the verbal data as complementary information. The description and keywords of forest referred to multiple topics and they were represented visually in the same framework of a sketch. The multiple motives were labelled as verbal data. Consequently, the results showed similar feature with linguistic knowledge, but these results provided more information than linguistic knowledge those found. Based on Ueda (2009), the social meaning was classified into seven groups, namely, forest structure, scenic view, recreational space, symbolic place, ecological system, forestry operation, and lifeworld (Figure 16).

Forest structure is a static explanation of vegetation structure which is usually objectified as forest types or mountain with the fewest landscape elements in the sideway view. This variable is described without forest usage, but it is only described with tree or mountain as a single landscape element. Scenic view is an idyll prospect of objective scene or scenic place category. It consists of various scenery in viewing angle: close-up and sideway view as foreground; and distant view as background. This variable is also described with emotional and aesthetic verbal description of the scenery. Recreational space is depicted with trail for people activities in the forest, and it mainly described as a surrounding place. Symbolic place is composed of single object such as a particular tree or part of a symbolic scene. It is depicted as a close-up view and described with strong impressions. This variable is rarely found in the sketches, except in Japanese sketches. There is a forest imagination consisting of unusual element. Ecological system is represented by description of dynamic system with fauna and flora (creature) or as an objective scene. Forestry operation represents distinctive methods of the forestry industry. In forestry operation variable, there was only Japanese students depicteding coniferous forests of Japanese cedar which was one of the three most beautiful man-made forests in Japan. They usually emphasized the regular tree stand and traditional method of forestry operation, notably the thick afforestation and frequent tree thinning. Lifeworld is formed by the

Figure 15 Self-orientation per country
surrounding woods and connected with settlements (artificial objects) which shows the daily life activities with the multiple variations of landscape elements in surrounding place.

Figure 16 Classification of social meaning. From left to right and top to bottom: forest structure, scenic view, recreational space, symbolic place, ecological system, forestry operation, lifeworld

As a result of statistical analysis, the probability value of forest structure (0.009), scenic view (0.023), and recreational space (0.000) was less than $\alpha=0.05$ (Table 7). Therefore, it could be concluded that there is significant difference between students of Japan and Indonesia in perceiving forest landscape, especially in forest structure, scenic view, and recreational space. In Indonesian sketches, the
representation of environmental attitudes was not included when they perceived the forest. Indonesian students preferred diverse sceneries to monotonous scenery in a frame. However, in Japanese sketches, the scenery composed with artificial elements of trail, temples or shrines became significant difference in characterizing forest as recreational space (Figure 7). This variable represented forest as the people’s accessible natural environment.

Table 7 Social meaning per country (%)

| Country | Forest structure | Scenic view | Recreational space | Symbolic place | Ecological system | Forestry operation | Lifeworld |
|---------|-----------------|-------------|--------------------|----------------|-------------------|-------------------|-----------|
| Japan   | 21.82           | 18.18       | 40                 | 1.82           | 20                | 1.82              | 1.82      |
| Indonesia | 46             | 38          | 8                 | 0              | 10                | 0                 | 4         |

Table 8 Prominent component of forest landscape using LIST (Ueda 2010) was classified and interpreted into landscape appraisal as basis for developing design concept (Lucas 1991). A total of ten prominent components was detected in Japan and Indonesia (Table 8). Prominent component in Japan was landscape element, while in Indonesia it was social meaning. In further details for developing forest landscape design (Lucas 1991), Japan had forest usage characterized by trail, people, surrounding place, and recreational space, while Indonesia had natural components and views characterized by understory plant, broadleaf forest, and roadside view to perceive forest landscape.

In Japan, landscape element including trail and people played an important role to encourage forest usage, thus Japanese students had environmental attitude towards the natural environment (Takayama 2010). Japan has cultural and historical influence in the way of viewing landscape (Higuchi 1989) characterized by temple (otera) and shrine (jinja) in remote distance from the forest.
Japanese people used forest as religious activities and recreational space. Meanwhile Indonesian people did their religious activities in mosque, church, shrine, or temple located in the center of settlement. Based on Pratiwi (2013), Ukiyo-e, genre of woodblock prints or woodcuts and paintings in Japan, especially one of Katsushika Hokusai’s pictures mostly depicted landscape and nature, like views of Mount Fuji which is combined by sea, lake, forest, agriculture farm, cherry blossom trees, and cultural building such as temple in close-up and distant view. This historical painting formed and influenced Japanese’s recognition and perception of landscape. Therefore, they distinguished the landscape based on the viewpoint.

In Indonesia, social meaning that was expressed by forest structure and scenic view indicated important factors in influencing forest design, namely, forest stands and aesthetic factors. Syaukani (2005) reinforced that the higher vegetation diversity index, the higher diversity in forest structure among the other areas. It showed that forest structure implied the variation in age, species, and management regimes (Lucas 1991). Moreover, nature landscape painting in Indonesia, especially in Abdullah Soerjo Soebroto’s painting consists of various complementary attributes such as dramatic cloud, yellowish ricefield, layered mountainous as middle ground and huge mountain as background (Ueda 2012; Hilary and Hujatnika 2013). This diversity of sceneries and the unity of local attributes are identified as the aesthetic factors in the forest (Lucas 1991). In this regard, prominent components based on LIST were explained further and they were in line with landscape appraisal.

| Prominent component of landscape image aspects |
|-----------------------------------------------|
| **Linguistic knowledge** | **Spatial View** | **Self-orientation** | **Social meaning** |
| **Landscape image (Ueda 2009)** | **Landscape element** | **Forest type** | **View** | **Surrounding place** | **Forest structure** | **Scenic view** | **Recreational space** |
| **Understory plant** | **Trail** | **People** | **Needle leaf forest** | **Broadleaf forest** | **Sideway view** | **Surrounding place** | **Forest structure** | **Scenic view** | **Recreational space** |
| Natural components | ■ | - | - | ● | ■ | - | - | - | - |
| Man made attributes | - | ⬤ | - | - | - | - | - | - | - |
| Aesthetic factors | - | - | - | - | - | - | - | ■ | - |
| Views | - | - | - | - | ■ | - | - | - | - |
| Recreation (forest usage) | - | ⬤ | ⬤ | - | - | - | ● | - | ● |
| Forest stands | - | - | - | - | - | - | - | ■ | - | - |

Note:
- ● Significant components in Japan
- ■ Significant components in Indonesia
- - Insignificant components
Factors Influencing Perception

Students’ attributes consisted of gender, age, past and present landscape type, past and present urbanization level, and experience of journey. Figure 18 shows that the number of male students (31.43% in Japan, 27.62% in Indonesia) were higher than female students (20.95% in Japan, 20% in Indonesia). At age attribute, Indonesian students have more various ages than Japanese students. At landscape type attribute, plain landscape was selected as the most liveable home stay in both countries. Moreover, at urbanization level attribute, rural area became scarcely populated region. Japanese students have the higher experience of journey than Indonesian students. About 48 Japanese students had ever travelled to foreign countries (45.71%).

Figure 18 Students’ attributes per country

Students’ attributes and linguistic knowledge

Among the Japanese students, two attributes had significant relationship with variables of linguistic knowledge, namely, past landscape type and past urbanization level (Table 9). As a result of statistical analysis, probability value of past landscape type and understory plant (0.026), and past urbanization level and water (0.030) was less than α=0.05. Therefore, it could be concluded that there is relationship between students’ attributes and forest landscape. Figure 19 shows that there were 10 Japanese students living in plain (18.18%), 7 students in mountain (12.73%), 4 students in coastal (7.27%), and 3 students in past basin.
landscape type (5.45%) perceived understory plant as landscape element. Mountain area and its surrounding have various types of understory plants because they were formed by fertile soil from the volcano eruption. Whereas two Japanese students living in city center (3.64%), 2 students in urban area (3.64%), 10 students in suburban area (18.18%), and 4 students in past rural area (7.27%) perceived water as landscape element (Figure 20). The water element such as lake, river, and stream could be found almost in suburban area and rural area which consist of more natural landscape than city center and urban area.

Table 9: Japanese students’ attribute and linguistic knowledge

| Variable     | Gender | Age | Past land.type | Present land.type | Past urb.level | Present urb.level | Exp.of journey |
|--------------|--------|-----|----------------|-------------------|----------------|-------------------|---------------|
| Mf           | 0.780  | 0.677 | 0.367          | 0.816             | 0.939          | 0.560             | 0.783         |
| Nf           | 0.947  | 0.655 | 0.556          | 0.135             | 0.939          | 0.683             | 0.620         |
| Bf           | 0.389  | 0.199 | 0.628          | 0.232             | 0.704          | 0.209             | 0.077*        |
| Uf           | 0.456  | 0.500 | 0.749          | 0.633             | 0.648          | 0.484             | 0.336         |
| Up           | 0.254  | 0.375 | 0.026**        | 0.162             | 0.473          | 0.157             | 0.565         |
| Te           | 0.721  | 0.594 | 0.368          | 0.084*            | 0.307          | 0.532             | 0.284         |
| Tr           | 0.183  | 0.500 | 0.862          | 0.731             | 0.102          | 0.160             | 0.226         |
| Cr           | 0.472  | 0.537 | 0.205          | 0.389             | 0.771          | 0.164             | 0.079*        |
| Wa           | 0.916  | 0.148 | 0.248          | 0.350             | 0.030**        | 0.731             | 0.434         |
| Ao           | 0.585  | 0.808 | 0.612          | 0.851             | 0.279          | 0.757             | 0.254         |
| Pe           | 0.871  | 0.518 | 0.438          | 0.143             | 0.610          | 0.433             | 0.669         |
| Sk           | 0.797  | 0.750 | 0.370          | 0.821             | 0.792          | 0.760             | 0.133         |

Note: *p < 0.1, **p < 0.05, ***p < 0.01, Mf: mixed forest, Nf: needle leaf forest, Bf: broadleaf forest, Uf: unknown forest, Up: understory plant, Te: terrain, Tr: trail, Cr: creature, Wa: water, Ao: artificial object, Pe: people, Sk: sky

Figure 19: The percentage of students related to past landscape type in perceiving understory plant
Among Indonesian students, six attributes had significant relationship with variables of linguistic knowledge, namely, past landscape type, present landscape type, past urbanization level, present urbanization level, gender, age (Table 10). As a result of statistical analysis, probability value of past landscape type and understory plant (0.021), present landscape type and mixed forest (0.006), present landscape type and creature (0.012), past urbanization level and mixed forest (0.027), present urbanization level and creature (0.020), and present landscape urbanization and sky (0.000), gender and mixed forest (0.029), gender and terrain (0.022), age and fallen trees (0.000) was less than $\alpha=0.05$. Therefore, it could be concluded that there is relationship between students’ attributes and forest landscape. Figure 21 until 28 show the percentage of students’ attribute in perceiving forest. A male students (2%) and 5 Indonesian female students (10%) perceived mixed forest as forest type. Each an Indonesian student (2%) living in plain and mountain, and 4 students in present basin landscape type (8%) perceived mixed forest as forest type. A student (2%) living in urban area, 2 students (4%) in suburban area, and 3 students in past rural area (6%) perceived mixed forest as forest type. An Indonesian student of 37-45 years old (2%) sketched fallen trees as forest type. Twenty five Indonesian students (50%) living in plain, 6 students in mountain (12%), and 5 students in coastal and past basin landscape type (10%) perceived understory plants as forest elements. The understory plants element was depicted by students living in all landscape types. Thirteen Indonesian male students (26%) and 3 female students perceived terrain as forest elements (6%). Male students have more experiences in outdoor recreation such as hiking or mountain biking than female students, thus they depicted terrain as one of landscape elements in their forest sketch. Three Indonesian students (6%) living in plain and 10 students in present basin landscape type (20%) perceived creature as landscape element. Thirteen Indonesian students living in present suburban area (26%) perceived creature as landscape element. Whereas a student living in present suburban area perceived sky as forest element (2%).
Table 10: Indonesian students’ attributes and linguistic knowledge

| Variable       | Mf       | Bf       | Un       | Ft       | Up       | Te       | Tr       | Cr       | Wa       | Ao       | Sk       |
|----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Gender         | 0.029**  | 0.393    | 0.764    | 0.390    | 0.184    | 0.022**  | 0.163    | 0.340    | 0.738    | 0.219    | 0.503    |
| Age            | 0.500    | 0.451    | 0.483    | 0.000*** | 0.664    | 0.360    | 0.820    | 0.801    | 0.187    | 0.909    | 0.909    |
| Past land.type | 0.663    | 0.783    | 0.799    | 0.112    | 0.021**  | 0.578    | 0.665    | 0.421    | 0.311    | 0.411    | 0.542    |
| Present land.type | 0.006*** | 0.464    | 0.490    | 0.670    | 0.727    | 0.783    | 0.913    | 0.012**  | 0.441    | 0.237    | 0.958    |
| Past urb.level | 0.027*** | 0.586    | 0.225    | 0.878    | 0.588    | 0.539    | 0.384    | 0.735    | 0.124    | 0.495    | 0.235    |
| Present urb.level | 0.740    | 0.644    | 0.353    | 0.902    | 0.840    | 0.487    | 0.931    | 0.020**  | 0.345    | 0.899    | 0.000*** |
| Exp. of journey | 0.737    | 0.736    | 0.375    | 0.592    | 0.079*   | 0.279    | 0.159    | 0.913    | 0.977    | 0.443    | 0.329    |

Note: *p < 0.1, **p < 0.05, ***p<0.01, Mf: mixed forest, Bf: broadleaf forest, Un: unknown forest, Ft: fallen trees, Up: understory plant, Te: terrain, Tr: trail, Cr: Creature, Wa: water, Ao: artificial object, Sk: sky

Figure 21: The percentage of students related to gender in perceiving mixed forest

Figure 22: The percentage of students related to present landscape in perceiving mixed forest
Figure 23 The percentage of students related to past urbanization level in perceiving mixed forest

Figure 24 The percentage of students related to age in perceiving fallen trees

Figure 25 The percentage of students related to past landscape type in perceiving understory plant
Figure 26 The percentage of students related to gender in perceiving terrain

Figure 27 The percentage of students related to present landscape type in perceiving creature

Figure 28 The percentage of students related to present urbanization level in perceiving creature and sky
Students’ attributes and spatial view

Statistically significant relationship among Indonesian students was not detected (Table 11), while among the Japanese students, an attribute had significant relationship with variable of spatial view, namely, past landscape type and sideway view (Table 12). As a result of statistical analysis, probability value of past landscape type and sideway view (0.038) was less than α=0.05. Therefore, it could be concluded that there is relationship between students’ attributes and forest landscape. Figure 29 shows the percentage of students’ attributes in perceiving spatial view. Eleven Japanese students living in plain (20%) and 3 students in coastal and past basin landscape type (5.45%) perceived sideway view as their spatial view of forest. People living in past plain landscape type sketched their forest from sideway view. They could view the forest clearly in particular distance describing the section of forest and composition of forest structure.

Table 11 Indonesian students’ attributes and spatial view

| Variable               | Close-up | Sideway view | Bird eye view | Distant view |
|------------------------|----------|--------------|---------------|--------------|
| Gender                 | 0.180    | 0.474        | 0.520         | 0.473        |
| Age                    | 0.776    | 0.491        | 0.199         | 0.820        |
| Past landscape type    | 0.357    | 0.214        | 0.186         | 0.678        |
| Present landscape type | 0.868    | 0.474        | 0.632         | 0.717        |
| Past urbanization level| 0.446    | 0.157        | 0.481         | 0.450        |
| Present urban level    | 0.740    | 0.623        | 0.226         | 0.213        |
| Experience of journey  | 0.166    | 0.563        | 0.609         | 0.159        |

Table 12 Japanese students’ attributes and spatial view

| Variable               | Close-up | Sideway view | Bird eye view | Distant view |
|------------------------|----------|--------------|---------------|--------------|
| Gender                 | 0.912    | 0.873        | 0.619         | 0.780        |
| Age                    | 0.099*   | 0.500        | 0.537         | 0.677        |
| Past landscape type    | 0.086*   | 0.038**      | 0.954         | 0.439        |
| Present landscape type | 0.650    | 0.308        | 0.840         | 0.505        |
| Past urbanization level| 0.059*   | 0.220        | 0.820         | 0.224        |
| Present urban level    | 0.275    | 0.328        | 0.525         | 0.590        |
| Experience of journey  | 0.808    | 0.972        | 0.275         | 0.264        |

Note: *p < 0.1, **p < 0.05, ***p<0.01
Students’ attributes and self-orientation

Among the Japanese students, three attributes had significant relationship with variables of self-orientation, namely, past urbanization level and scenic place, experience of journey and single object, and age and scenic place (Table 13). As a result of statistical analysis, probability value of past urbanization level and scenic place (0.002) experience of journey and single object (0.029), age and scenic place (0.004) was less than α=0.05. Therefore, it could be concluded that there is relationship between students’ attributes and forest landscape. Figure 30 shows that 12 students (21.82%) travelling abroad and 10 Japanese students (18.18%) travelling around Japan perceived single object as self-orientation in the forest. Whereas five students of 27-35 years old (9.09%), 1 student of 19-26 years old (1.82%), 1 students living in city center (1.82%), 2 students in suburban area (3.64%), and 3 Japanese students in past rural area (5.45%) perceived scenic place as self-orientation in the forest (Figure 31 and 32). The middle age students and students living in rural area had more scenic feeling than students living in suburban area, even city center.

Table 13 Japanese students’ attributes and self-orientation

| Variable                   | Single object | Objective scene | Surrounding place | Scenic place |
|----------------------------|---------------|-----------------|-------------------|--------------|
| Attribute                  |               |                 |                   |              |
| Gender                     | 0.580         | 0.425           | 0.637             | 0.269        |
| Age                        | 0.410         | 0655            | 0.481             | 0.004***     |
| Past landscape type        | 0.631         | 0.495           | 0.782             | 0.555        |
| Present landscape type     | 0.252         | 0.060*          | 0.889             | 0.843        |
| Past urbanization level    | 0.263         | 0.416           | 0.411             | 0.002***     |
| Present urban level        | 0.933         | 0.541           | 0.388             | 0.399        |
| Experience of journey      | 0.029**       | 0.620           | 0.157             | 0.478        |

Note: *p < 0.1, **p < 0.05, ***p<0.01
Figure 30 The percentage of students related to experience of journey in perceiving single object

Figure 31 The percentage of students related to age in perceiving scenic place

Figure 32 The percentage of students related to past urbanization level in perceiving scenic place
Among Indonesian students, an attribute had significant relationship with variable of self-orientation, namely, experience of journey and objective scene (Table 14). As a result of statistical analysis, probability value of experience of journey and objective scene (0.03) was less than $\alpha=0.05$. Therefore, it could be concluded that there is relationship between students’ attributes and forest landscape. Figure 33 shows that 5 Indonesian students (10%) travelling around Indonesia and abroad perceived objective scene as self-orientation in the forest. Experience of journey encourages people to find, observe, and perceive forest landscape. Having experience by visiting various place of their country or other countries with different landscape characteristics, students have different ways in seeing landscape.

### Table 14: Indonesian students’ attributes and self-orientation

| Variable                  | Single object | Objective scene | Surrounding place | Scenic place |
|---------------------------|---------------|-----------------|-------------------|--------------|
| Gender                    | 0.598         | 0.115           | 0.735             | 0.520        |
| Age                       | 0.535         | 0.083*          | 0.820             | 0.801        |
| Past landscape type       | 0.267         | 0.875           | 0.056*            | 0.470        |
| Present landscape type    | 0.573         | 0.862           | 0.375             | 0.632        |
| Past urbanization level   | 0.304         | 0.774           | 0.384             | 0.481        |
| Present urban level       | 0.644         | 0.192           | 0.485             | 0.130        |
| Experience of journey     | 0.119         | 0.017**         | 0.880             | 0.609        |

Note: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$**

![Figure 33: The percentage of students related to experience of journey in perceiving objective scene](image)

**Students’ attributes and social meaning**

Statistically significant relationship among Indonesian students was not detected (Table 15), while among the Japanese students, four students’ attributes had significant relationship with variables of social meaning, namely, present landscape type and forest structure, past urbanization level and scenic view, past urbanization level and symbolic place, present urbanization level and scenic view, and age and scenic view (Table 16). As a result of statistical analysis, probability value of present landscape type and forest structure (0.035), past urbanization
level and scenic view (0.011), present urbanization level and scenic view (0.029), past urbanization level and symbolic place (0.04), and age and scenic view (0.032), was less than \( \alpha = 0.05 \). Therefore, it could be concluded that there is relationship between students’ attributes and forest landscape. Figure 34 until 38 show students’ attributes in perceiving forest landscape. Nine students living in plain (16.36%) and 3 students (5.45%) in present coastal landscape type perceived forest structure. Two students living in city center (3.64%), 1 student (1.82%) in urban area, 5 students in sub urban area (9.09%), and 2 students in past rural area (3.64%) perceived scenic view. Two students living in city center and urban area (3.64%), and 6 students in present suburban area (10.91%) still perceived scenic view. Nine students of 19-27 years old (16.36%), 1 student of 28-36 years old (1.82%) perceived scenic view. Whereas a student living in past rural area (1.82%) perceived symbolic place as social meaning of forest. Kodama sketched by Japanese students describes a spirit living in a tree. In animated film, kodama appears like white humanoids with large, rattling heads, and has mask-like features, moreover, it is similar to bobbleheads like what Japanese students sketched in their image sketch.

Table 15 Indonesian students’ attributes and social meaning

| Variable         | Forest structure | Scenic view | Recreational space | Ecological system | Lifeworld |
|------------------|------------------|-------------|--------------------|-------------------|-----------|
| Gender           | 0.441            | 0.563       | 0.163              | 0.293             | 0.219     |
| Age              | 0.577            | 0.226       | 0.820              | 0.820             | 0.909     |
| Past landscape type | 0.347            | 0.862       | 0.665              | 0.730             | 0.411     |
| Present landscape type | 0.390           | 0.325       | 0.913              | 0.191             | 0.237     |
| Past urbanization level | 0.257       | 0.770       | 0.384              | 0.520             | 0.495     |
| Present urban level | 0.766            | 0.329       | 0.931              | 0.373             | 0.899     |
| Experience of journey | 0.158           | 0.564       | 0.159              | 0.909             | 0.443     |

Table 16 Japanese students’ attributes and social meaning

| Variable         | Forest structure | Scenic view | Recreational space | Symbolic place | Ecological system | Forestry operation | Lifeworld |
|------------------|------------------|-------------|--------------------|----------------|-------------------|---------------------|-----------|
| Gender           | 0.721            | 0.278       | 1.000              | 0.357          | 0.498             | 0.269               | 0.357     |
| Age              | 0.594            | 0.032**     | 0.410              | 0.891          | 0.614             | 0.891               | 0.891     |
| Past landscape type | 0.493            | 0.430       | 0.543              | 0.205          | 0.459             | 0.901               | 0.901     |
| Present landscape type | 0.035**         | 0.565       | 0.218              | 0.968          | 0.948             | 0.968               | 0.968     |
| Past urbanization level | 0.745           | 0.011**     | 0.346              | 0.040**        | 0.500             | 0.302               | 0.901     |
| Present urban level | 0.836            | 0.029**     | 0.347              | 0.567          | 0.392             | 0.567               | 0.567     |
| Experience of journey | 0.282            | 0.142       | 0.808              | 0.518          | 0.182             | 0.518               | 0.518     |

Note: *p < 0.1, **p < 0.05, ***p<0.01
Figure 34 The percentage of students related to present landscape type in perceiving forest structure

Figure 35 The percentage of students related to past urbanization level in perceiving scenic view

Figure 36 The percentage of students related to present urbanization level in perceiving scenic view
In Japan, age, landscape type, and urbanization level had relationship with most of social meaning variables. Forest structure was perceived as social meaning by students living in present plain landscape type. Various types of scenery featuring middle ground and background in the same scene (scenic view) were perceived by students of 19-26 years old, students living in past and present suburban area. Referring to Pratiwi (2013), landscape type was recognized and categorized by Japanese students into different distance and view angle, namely, wetland in close-up and distant view, and forest in close-up and distant view. Whereas *kodama* was drawn as symbolic place describing a spirit living in a tree by students living in past rural area. In Heian period dictionary, the *Wamyou Ruijushou*, tree gods are believed with mysterious supernatural power because people will be cursed if they attempt to cut it down.

In Indonesia, gender, age, landscape type, and urbanization level had relationship with most of linguistic knowledge variables. The understory plant was perceived as landscape element by students living in past plain landscape type which is shown in shifting cultivation in the forest since pre-colonial period of Netherlands (Prabowo et al. 2010). Male students have more experiences and interests in outdoor recreation (Lorber 2010) such as hiking or mountain biking.
than female students do, thus terrain was drawn by them as one of landscape elements in their forest sketch. The creature was perceived landscape element by students living in present basin landscape type and present suburban area. Moreover, the sky was perceived as landscape element by students living in present suburban area. The mixed forest was perceived as forest type by female students, students living in present basin landscape type, and students in past rural area. This was in line with Sears et al. (1991) that female students tend to interact with everyone or environment such as forest in closer distance than male students do.

Students also have familiarity with the environment of their home town that rurality joins statements about a closely knit community with very sparse population, peace and quiet environment and unlogged forest with low traffic, and unpolluted air, water, and soil (Elands et al. 2004). The familiarity is not formed by activity or experience in short period of time. In addition, this study was implemented after landscape preferences study was conducted where students did photo grouping, landscape preference and exoticism evaluation, then they sketched their forest image. Nine sketches (8.57%) had a similar image with the photographs in previous study, namely, 4 Japanese students sketched forest with or without trail in close-up and distant view, 5 Indonesian students sketched forest with water (river), understory plant, and terrain in sideway view (Pratiwi 2013). This similar sketch had no significant relationship or influence with the previous study taken in the same time of research survey. Fallen trees were perceived by students of 37-45 years old reinforced by Dolphin (1994) that the higher age the greater distance people interact with their environment. It could be concluded that there is a relationship between students’ attributes and forest landscape (Table 17).

Table 17 Prominent factors influencing perception

| Landscape element | Forest type | Spatial view | Self-orientation | Social meaning |
|-------------------|-------------|--------------|-----------------|---------------|
| Understory plant  | -           | -            | -               | -             |
| Terrain           | -           | -            | -               | -             |
| Creature          | -           | -            | -               | -             |
| Water             | -           | -            | -               | -             |
| Sky               | -           | -            | -               | -             |
| Mixed forest      | -           | -            | -               | -             |
| Fallen trees      | -           | -            | -               | -             |
| Sideway view      | -           | -            | -               | -             |
| Scenic place      | -           | -            | -               | -             |
| Single object     | -           | -            | -               | -             |
| Objective scene   | -           | -            | -               | -             |
| Scenic view       | -           | -            | -               | -             |
| Forest structure  | -           | -            | -               | -             |
| Scenic view       | -           | -            | -               | -             |
| Symbolic place    | -           | -            | -               | -             |

Note: ● Significant factors in Japan
■ Significant factors in Indonesia
- Insignificant factors
Forest Landscape Characters

Recognition of perception as a biological process underscored another important point: perception entailed symbolic representations (Blake and Sekuler 2006), thus students’ perception reflected forest landscape characters in their countries. Cluster analysis was applied to characterize forest landscape. The classification of potential landscape image variables in creating a cluster profile was calculated using range formula:

\[
\text{Interval} = \frac{\text{score}_{\text{max}} - \text{score}_{\text{min}}}{\text{the number of classification}} = \frac{1 - 0}{3} = 0.33
\]

The level of the potential landscape image variables was divided into highly potential (mean score 0.68-1), moderately potential (mean score 0.34-0.67), and marginally potential (mean score 0-0.33). Japanese students distinguished forest characters into five clusters, while Indonesian students distinguished forest characters into four clusters (Figure 39). The primary point characterizing Indonesian cluster was scenic natural environment (Figure 40), while the primary point characterizing Japanese cluster was environmental attitude towards the natural environment characterized by trail and people with recreational activities in the forest (Figure 41).

Interpretation of Japanese cluster

1. Broadleaf forest type with water in close-up view

The first cluster consisted of 10 students. The characteristic of this cluster was determined by broadleaf forest type with natural component of water. A place as scenery without spatial continuity from the viewpoint (scenic view) was created by the combination of various landscape elements (objective scene). Elands et al. (2004) reinforced that people associate forest mainly as an element of the natural environment that creates a locally distinct character. Scenic view was recognized not only from a distant view, but also from close-up view.

2. Diverse forests type with understory plant in close-up view

The second cluster consisted of 10 students. The characteristic of this cluster was determined by diverse forests type with natural component of understory plant as cluster of elements without words concerning forest usage. This characteristic was similar to the first cluster characterized by the absence of forest usage. In this cluster, single object and forest structure were perceived sequentially by students as self-orientation and social meaning variables which they didn’t include the representation of the viewer's subjective attitudes and activities (Ueda 2012).

3. Unknown forest type with trail in diverse views

The third cluster consisted of 14 students. The characteristic of this cluster was determined by unknown forest type with human attributes of trail and people, and natural component of understory plant. The relationship between various elements and the body-subject (viewpoint) in a frame implied that the students perceived surrounding place whose both variables of elements and viewpoint mainly describing recreational space as forest’s service in quality of life (Elands et al. 2004).

4. Needle leaf and unknown forest type with people in sideway view

The fourth cluster consisted of 4 students. The characteristic of this cluster was determined by needle leaf and unknown forest type with human attribute of
people. This cluster was almost similar to the third cluster in which people also influenced the forming of recreational space as one of social meaning variables. The difference between these clusters was that a sum of trees became merely a single object in the forest.

5. **Broadleaf forest type with creature in bird eye view**

The last cluster consisted of 17 students. The characteristic of this cluster was determined by broadleaf forest type with natural components consisting of creature, understory plant, water, and terrain and human attribute consisting of people. Although this cluster was characterized by various elements, the diversity of wildlife and topography became a cluster of elements (single object). Consequently, recreational space and ecological system was perceived by students as social meaning variables.

**Interpretation of Indonesian cluster**

1. **Broadleaf forest with water and understory plant in bird eye view**

The first cluster consisted of 12 students. The characteristic of this cluster was expressed by broadleaf forest type with natural components of water, understory plant, and terrain. The combination of various landscape elements identified by diverse sceneries (scenic view) and viewpoint allowed the students to see the forest as scenic place. The travellers are still willing to do nature-based tourism because of the distinctiveness and beauty of nature (Satyatama et al. 2010), although the accessibility to the natural attraction in forest is generally damaged and inadequate (Purnomo 2011).

2. **Broadleaf forest with understory plant and terrain in sideway view**

The second cluster consisted of 11 students. The characteristic of this cluster was expressed by broadleaf forest type with natural components of terrain, understory plant, water, and creature. A place as scenery without spatial continuity from the viewpoint (scenic view) was created by the combination of various landscape elements (objective scene). People perceiving the total scenery has a wider interest in nature, it is expected that better place, object, and event type of experience would be guaranteed by planners and managers (Oku & Fukamachi 2005).

3. **Broadleaf forest with understory plant and creature in close-up and sideway view**

The third cluster consisted of 10 students. The characteristic of this cluster was expressed by broadleaf forest type with natural components of understory plant and creature. Most of sketches were composed by understory plant (single object) describing forest structure. It is often shown in close-up view and sideway view of forest composed by just trunks of trees (Ueda 2006).

4. **Broadleaf and unknown forest with understory plant in sideway view**

The last cluster consisted of 17 students. The characteristic of this cluster was expressed by broadleaf and unknown forest type with natural component of understory plant. This cluster was almost similar to the third cluster characterized by a cluster of understory plant as single object and described as forest structure. In addition, according to local people’s perception, unlogged forest or primary forest is the most important land type because it is a source of livelihood which has the existence of historical values and abundance of valuable resources (Liswanti et al. 2004).
Figure 39 Dendogram of Japanese and Indonesian cluster

Figure 40 Forest landscape sketch of Indonesian cluster
Guidance for Forest Landscape Design

Based on various perceptions and interpretations of forests from cross-national perspectives, the implication of forest landscape design could be discussed as public interests. Forest interpretation was derived from cluster analysis and based on the principle of forest landscape design (Table 18 and 19). The only components categorized in Japanese cluster were people, trail, needle leaf forest, surrounding place, recreational space, and ecological system, while the only component categorized in Indonesian cluster were scenic place. These components varied in a number of ways (variables) including shape and visual force. The ways of organizing components of landscape elements and forest type were used to group components, for example scale, diversity, unity, genius loci. Shape, visual force, scale, diversity, unity, and spirit of the place or genius loci are the most important principle of forest landscape design. They have the greatest impact on perception and have been found to be closely related to good or bad results (Lucas 1991).

Figure 41 Forest landscape sketch of Japanese cluster
The characters of forest landscape could become important goal for formulating the concept of forest landscape design in both countries. Generally, it should keep the balance of natural continuity of landform reflecting the various scale of the landscape from one part to another. It meant that larger variation was needed to form a background to the more diverse pattern of terrain, while smaller details of vegetation, understory plant, water, and trail were more appropriate in foreground or middle ground. In Japan, more spatial improvements were needed for recreational activities. Some considerations of spatial improvement could be applied for forest landscape design in Japan (Lucas 1991) as follows:
a. **Design of open space**

There are two types of open spaces which could be improved as recreational surrounding place, namely, extensive space and linear space. Extensive space could be developed on steeper slopes and at higher elevations such as unplantable land, farm field, felling coupe, and important wildlife site which have significant visual impact. Better views are obtained from recreation routes positioned higher slope. Whereas linear space could be developed by improving the shape, varying the width of the space, and avoiding parallel sides. Besides that, open space is not only needed for recreational space, but also for management, rock outcrops, powerline corridor, open habitat, and unplanted stream side.

b. **Recreational site and walking route**

Historical or cultural element and site might have a recreational role and become historic interest providing the opportunities for interpretation and it contributes to diversity. Sequence of design was considered for the enjoyment of visitors and improvement of wildlife as follows:

- Shaping the crop edge to vary the size, width, and direction of spaces and varying the alignment of the path within the original ride.
- Selecting place with good views for picnics or rest and planting large shrubs as wind-break shelter.
- Emphasizing constrictions of space to various degrees by retaining conifers and planting broadleaved trees and shrubs.
- Adding occasional tree groups where the path crosses extensive space.
- Wildlife and visual diversity, could be achieved by managing other areas as low shrubs, coppice, or rough grass.

Moreover, walking route provides and facilitates the accessibility to easily interact with forest such as touching the leaves and water, breathing the fresh air, and having relaxation. In Japan, forest bathing trip is a short and leisurely trip to visit forest park, called Shinrinyoku, which is similar to natural aromatherapy. This good lifestyle significantly enhances human natural killer cell (NK) activity, increases anti-cancer proteins, and reduces stress (Li *et al.* 2006, 2008).

In Indonesia, aesthetic quality could be developed by considering the viewpoint out of the forest such as settlements, public roads, footpaths, summits, and so on. Furthermore, the sequence of views on roads and footpaths such as forest edge and roadsides, and the direction and sideways extent of the view from key points should be identified and mapped (Lucas 1991) as follows:

a. **Forest edge**

In wilder landscape, there should be a gradual change from the solid mass of the forest to open ground. Uniform edges should be varied in scale with the landscape by introducing irregular groups, various species, spacing, and detailed shaping of the edge.

b. **Roadsides**

Roadside spaces should be planned to dramatize natural features and motorists’ sense of movement so that high quality and small scale landscape with potential for recreation should be identified and conserved. The followings are the important points that should be considered.

- The entrance and exit of the public road into and out of forest are important because the openness of the landscape changes dramatically.
• The view from vehicle to outside, especially road junction, narrow bridge, sharp bend, steep hill, and blind summit should be quite simple.
• Changes in landscape character, space opening out and closing in, landmark seen from different viewpoint heighten the sense of motion.
• Focal point on the road is also identified such as outstanding views of landscape elements (waterfall, terrain, and the other elements).
• The number of man-made structure, sign, notice, fence no longer required should be reduced to an absolute minimum.
• Distant view could be accessed on gentler downhill section of road, at summit and on the outside of bend.

5 CONCLUSIONS AND SUGGESTIONS

Conclusions

The prominent components of landscape image in Japan were identified by trail, people, needle leaf forest, surrounding place, and recreational space. The prominent components of landscape image in Indonesia were identified by understory plant, broadleaf forest, sidewalk view, forest structure, and scenic view. Factors influencing perception consisted of gender, age, past landscape type, present landscape type, past urbanization level, present urbanization level, and experience of journey. The only attribute influencing perception for Indonesian students was gender. Japanese students distinguished forest type into needle leaf, broadleaf, and unknown forest type, while Indonesian students distinguished forest type into broadleaf and unknown forest type.

Suggestions

Based on the results of this study, the author proposes the suggestions regarding Perception of Forest Landscape Using LIST Method between University Students of Japan and Indonesia as follows:

The need for the further study to add study objects for examining more various perceptions with valid results.
For the further study, the other landscapes could be investigated to find the distinctive landscape characteristics and classification.
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# APPENDIX

## Appendix 1 Data attributes of respondents

| Respondent number | Jenis Kelamin. (Gender) | Umur (Age) | Kewarganegaraan (Nationality) | Pendidikan (Education) | Mayor (Major) | Pekerjaan (Occupation) | Level urbanisasi (Urbanization level) | Tipe lanskap tempat tinggal anda sekarang (Type of landscape in the region of your stay) | Pengalaman Wisata (Experience of journey) |
|--------------------|--------------------------|------------|-------------------------------|------------------------|--------------|------------------------|--------------------------------------|---------------------------------------------------------------------------------|-----------------------------------|
|                    | 1. Pria Male             | ( ) tahun years old | 1. Indonesia 2. Jepang Japan 3. Lainnya (Other) | 1. Sarjana Undergraduate 2. Master Graduate 3. Doktor Post doctoral 4. Lainnya (Other) | 1. Teknik Technical 2. Ilmu Alam Natural Science 3. Kemanusiaan Humanity 4. Lainnya (Other) | 1. Pelajar Student 2. Dosen Lecturer 3. Lainnya (Other) | 1. Pusat Kota City center 2. Perkotaan Urban area 3. Pinggiran kota Sub urban area 4. Pedesaan Rural area | 1. Dataran Plain 2. Pegunungan Mountain 3. Pesisir Coastal 4. Cekungan Basin 5. Lainnya (Other) | 1. Domestik Domestic 2. Indonesia 3. Jepang Japan 4. Negara lainnya Other foreign country |

You will refine the type of the region, where you lived up to 18 years.
| 身番号 | 1. 男性  | 2. 女性  |
|-------|---------|---------|
|  | Male    | Female  |

| 年齢 |  |  |
|------| | |
|  | Years old |

| 国籍 | 1. インドネシア | 2. 日本 | 3. その他( ) |
|------|----------------|--------|--------------|
|  | Indonesia      | Japan  | other        |

| 学歴 | 1. 大学院 | 2. 大学院 | 3. 博士課程修了 | 4. その他( ) |
|------|----------|----------|----------------|------------|
|  | Graduate | Graduate | Post doctoral | other      |

|  |  |  |  |  |
|  |  |  |  |  |

| 所属 | 1. 学生 | 2. 教員 | 3. その他( ) |
|------|---------|--------|--------------|
|  | Student | Faculty | other        |

| 専門 | 1. 技術 | 2. 自然科学 | 3. 人類 | 4. その他( ) |
|------|---------|------------|-------|--------------|
|  | Technical | Natural Science | Humanity | other        |

| 所属 | 1. 学生 | 2. 教員 | 3. その他( ) |
|------|---------|--------|--------------|
|  | Student | Faculty | other        |

| 居住地の都市化の程度 | 1. 都市の中心部 | 2. 都市 | 3. 近郊 | 4. 農村 |
|----------------------|-----------------|--------|-------|--------|
|  | City center | Urban area | Suburban area | Rural area |

| 居住地のランドスケープタイプ | 1. 平原 | 2. 山地 | 3. 海岸 | 4. 台地 | 5. その他( ) |
|---------------------------|--------|--------|-------|-------|------------|
|  | Plains | Mountain | Coastal | Basin | other      |

|  |  |  |  |  |  |
|  |  |  |  |  |  |

| 就学の経験 | 1. 国内のみ | 2. インドネシア | 3. 日本 | 4. その他の海外 |
|-------------|------------|---------------|-------|----------------|
|  | Domestic | Indonesia | Japan | Other Foreign Countries |

|  |  |  |  |  |  |
|  |  |  |  |  |  |

|  |  |  |  |  |  |
|  |  |  |  |  |  |

| 居住地の都市化の程度 | 1. 都市の中心部 | 2. 都市 | 3. 近郊 | 4. 農村 |
|----------------------|-----------------|--------|-------|--------|
|  | City center | Urban area | Suburban area | Rural area |

| 居住地のランドスケープタイプ | 1. 平原 | 2. 山地 | 3. 海岸 | 4. 台地 | 5. その他 ( ) |
|---------------------------|--------|--------|-------|-------|------------|
|  | Plain | Mountain | Coastal | Basin | other      |
Appendix 2 Free association survey of landscape image sketches of forest in Japan and Indonesia

Kami bertujuan untuk membandingkan gambar ‘hutan’ di Jepang dan Indonesia. Investigasi ini menganalisis kata kunci linguistik dan sketsa visual dari gambar hutan.

We aim to compare the imagery of ‘forest’ between Japan and Indonesia. This investigation analyzes the linguistic keywords and visual sketching of your forest image.

Silakan mengisi kuesioner dengan pena.

Please fill out the form with the pen

(15 menit)

Prosedur

1. Apa yang anda bayangkan dari kata “hutan”?  
   Mengenai gambar hutan anda, silakan jawab pertanyaan berikut. 
   
   What do you imagine with the word ‘forest’?
   
   About your own forest image, please answer the following three questions

2. Silakan isi tabel di halaman selanjutnya dengan beberapa kata kunci tentang asosiasi ‘hutan’ yang anda bayangkan (min 3-10 kata). 
   Please fill in the blanks with some keywords about your free association ‘forest’ (min 3 words - 10 words)

(2 menit)

3. Silakan jelaskan situasi gambar hutan dengan beberapa kalimat (maks 100 kata) 
   Please explain the situation of your forest image with some sentences (max 100 words)

(5 menit)

4. Silakan membuat sketsa hutan yang anda bayangkan (dapat ditambahkan dengan kata-kata jika itu penting). 
   Please make a brief sketch of your forest image (with keywords if necessary) (5 menit)
| Kata kunci |
|------------|
|            |
|            |
|            |

| Situasi |
|---------|
|         |
|         |
|         |
Sketsa

*Image Sketch*
森林イメージに関するアンケート

この調査では、日本とインドネシアの森林に対するイメージの違いを明らかにするために、「森林」というキーワードから連想するイメージをスケッチと単語で調べます。記入は黒ボールペンを使用してください。

（所要時間15分）

＜手順＞

「森林」という言葉を聞いて、何を想像しますか。

そのイメージに関して、3つの質問に答えてください。

①「森林」というイメージから連想する単語を記入ください（3個以上記入してください。）2分
②そのイメージの状況を文章で説明してください（300字程度）5分
③そのイメージの簡単なスケッチを次のページに描いてください。（必要であればキーワードを書き込んでください）5分

①キーワード

②状況記述
スケッチ
Appendix 3 The result of Chi-square test using SPSS 16.0

1) Landscape element and country

| Case Processing Summary |
|-------------------------|
| Cases                  |
|                         | Valid | Missing | Total |
|                         | N     | Percent | N     | Percent | N     | Percent |
| UnderstoryPlant * Country | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
|                       | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| Perenn * Country       | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
|                       | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| Ever * Country         | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
|                       | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| Shrub * Country        | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
|                       | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| Water * Country        | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
|                       | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| ArtificialObject * Country | 105 | 100.0%  | 0     | .0%     | 105   | 100.0%  |
|                       | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| People * Country       | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
|                       | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |

| UnderstoryPlant * Country Crosstab |
|------------------------------------|
| Country                           |
| Japan | Indonesia | Total |
|-------|------------|-------|
| 0     | Count      | 31    | 9    | 40   |
|       | Expected Count | 21.0  | 19.0 | 40.0 |
| 1     | Count      | 24    | 41   | 65   |
|       | Expected Count | 11.0  | 10.0 | 21.0 |

| Chi-Square Tests |
|------------------|
| Value             | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
| Pearson Chi-Square | 16.345* | 1 | .000 | | |
| Continuity Correction | 14.759 | 1 | .000 | | |
| Likelihood Ratio | 17.059 | 1 | .000 | | .000 |
| Fisher's Exact Test | | | | .000 |
| Linear-by-Linear Association | 16.189 | 1 | .000 | | .000 |
| N of Valid Cases | 105 | | | | |

| Trail * Country Crosstab |
|--------------------------|
| Country                 |
| Japan | Indonesia | Total |
|-------|------------|-------|
| 0     | Count      | 38    | 46   | 84   |
|       | Expected Count | 44.0  | 40.0 | 84.0 |
| 1     | Count      | 17    | 4    | 21   |
|       | Expected Count | 11.0  | 10.0 | 21.0 |
| Total | Count      | 55    | 50   | 105  |
|       | Expected Count | 55.0  | 50.0 | 105.0 |
### Chi-Square Tests

|                      | Value   | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|----------------------|---------|----|-----------------------|----------------------|----------------------|
| Pearson Chi-Square   | 8.591   | 1  | .003                  |                      |                      |
| Continuity Correction | 7.219   | 1  | .007                  |                      |                      |
| Likelihood Ratio     | 9.187   | 1  | .004                  | .004                 | .003                 |
| Fisher's Exact Test  | 8.509   | 1  | .004                  |                      |                      |
| N of Valid Cases     | 105     |    |                       |                      |                      |

### People * Country Crosstab

|                | Country     |           |           |
|----------------|-------------|-----------|-----------|
|                | Japan       | Indonesia | Total     |
| People         |             |           |           |
| 0 Count        | 39          | 50        | 89        |
| Expected Count | 46.6        | 42.4      | 89.0      |
| 1 Count        | 16          | 0         | 16        |
| Expected Count | 8.4         | 7.6       | 16.0      |
| Total Count    | 55          | 50        | 105       |
| Expected Count | 55.0        | 50.0      | 105.0     |

### Chi-Square Tests

|                      | Value   | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|----------------------|---------|----|-----------------------|----------------------|----------------------|
| Pearson Chi-Square   | 17.160  | 1  | .000                  |                      |                      |
| Continuity Correction | 14.982  | 1  | .000                  |                      |                      |
| Likelihood Ratio     | 23.306  | 1  | .000                  |                      | .000                 |
| Fisher's Exact Test  | 16.997  | 1  | .000                  |                      |                      |
| N of Valid Cases     | 105     |    |                       |                      |                      |

### Case Processing Summary

|                        | Valid | Missing | Total |
|------------------------|-------|---------|-------|
| N                      | Percent | N     | Percent | N     | Percent |
| MixedForest * Country  | 105   | 100.0% | 0      | .0%   | 105    | 100.0% |
| NeedleleafForest * Country | 105 | 100.0% | 0      | .0%   | 105    | 100.0% |
| BroadleafForest * Country | 105 | 100.0% | 0      | .0%   | 105    | 100.0% |
| Unknown * Country      | 105   | 100.0% | 0      | .0%   | 105    | 100.0% |
| FallenTrees * Country  | 105   | 100.0% | 0      | .0%   | 105    | 100.0% |
|                       | Country |       |       |       |
|-----------------------|---------|-------|-------|-------|
|                       | Japan   | Indonesia | Total |
| NeedleleafForest      |         |         |       |
| 0 Count               |         |         |       |
| Expected Count        | 50.3    | 45.7   | 96.0  |
| 1 Count               |         |         |       |
| Expected Count        | 4.7     | 4.3    | 9.0   |
| Total Count           | 55.0    | 50.0   | 105.0 |

|                       | Value   | df  | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|-----------------------|---------|-----|-----------------------|----------------------|----------------------|
| Pearson Chi-Square    | 8.949   | 1   | .003                  |                      |                      |
| Continuity Correction | 6.983   | 1   | .008                  |                      |                      |
| Likelihood Ratio      | 12.405  | 1   | .000                  |                      |                      |
| Fisher's Exact Test   | 8.864   | 1   | .003                  | .003                 | .002                 |
| Linear-by-Linear Association | 6.983 | 1 | .008 | |
| N of Valid Cases      | 105     |     |                       |                      |                      |

| BroadleafForest       |         |       |       |
|                       | Country |       |       |       |
|                       | Japan   | Indonesia | Total |
| 0 Count               |         |         |       |
| Expected Count        | 28.3    | 25.7   | 54.0  |
| 1 Count               |         |         |       |
| Expected Count        | 26.7    | 24.3   | 51.0  |
| Total Count           | 55.0    | 50.0   | 105.0 |

|                       | Value   | df  | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|-----------------------|---------|-----|-----------------------|----------------------|----------------------|
| Pearson Chi-Square    | 4.991   | 1   | .025                  |                      |                      |
| Continuity Correction | 4.156   | 1   | .041                  |                      |                      |
| Likelihood Ratio      | 5.030   | 1   | .025                  |                      |                      |
| Fisher's Exact Test   | 4.944   | 1   | .026                  |                      |                      |
| Linear-by-Linear Association | 4.944 | 1 | .026 | |
3) Spatial view and country

Case Processing Summary

| Cases        | Valid | Missing | Total |
|--------------|-------|---------|-------|
|              | N     | Percent | N     | Percent |
| Closeup * Country | 105   | 100.0%  | 0     | .0%     |
| Sideway * Country | 105   | 100.0%  | 0     | .0%     |
| BirdEyeView * Country | 105   | 100.0%  | 0     | .0%     |
| DistantView * Country | 105   | 100.0%  | 0     | .0%     |

Sideway * Country Crosstab

| Country | Japan | Indonesia | Total |
|---------|-------|-----------|-------|
| Sideway | 38    | 22        | 60    |
| Expected Count | 31.4 | 28.6 | 60.0 |
| 1 Count | 17    | 28        | 45    |
| Expected Count | 23.6 | 21.4 | 45.0 |
| Total Count | 55    | 50        | 105   |
| Expected Count | 55.0 | 50.0 | 105.0 |

Chi-Square Tests

| Test                      | Value | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---------------------------|-------|----|------------------------|-----------------------|-----------------------|
| Pearson Chi-Square        | 6.733 | 1  | .009                   |                       |                       |
| Continuity Correction b   | 5.747 | 1  | .017                   |                       |                       |
| Likelihood Ratio          | 6.797 | 1  | .009                   | .011                  | .008                  |
| Fisher's Exact Test       |       |    |                        | .010                  |                       |
| Linear-by-Linear Association | 6.669 | 1  | .010                   |                       |                       |
| N of Valid Cases b        | 105   |    |                        |                       |                       |

4) Self-orientation and country

Case Processing Summary

| Cases         | Valid | Missing | Total |
|---------------|-------|---------|-------|
|               | N     | Percent | N     | Percent |
| SingleObject * Country | 105   | 100.0%  | 0     | .0%     |
| ObjectiveScene * Country | 105   | 100.0%  | 0     | .0%     |
| SurroundingPlace * Country | 105   | 100.0%  | 0     | .0%     |
| ScenicPlace * Country    | 105   | 100.0%  | 0     | .0%     |
### SurroundingPlace * Country Crosstab

| SurroundingPlace | Country       |       |       |       |
|------------------|---------------|-------|-------|-------|
|                  | Japan         | Indonesia | Total |       |
| 0                | 37            | 46     | 83    |       |
|                  | 43.5          | 39.5   | 83.0  |       |
| 1                | 18            | 4      | 22    |       |
|                  | 11.5          | 10.5   | 22.0  |       |
| **Total**        | **55**        | **50** | **105** |       |
|                  | **55.0**      | **50.0** | **105.0** |       |

### Chi-Square Tests

| Value        | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|--------------|----|-----------------------|----------------------|----------------------|
| Pearson Chi-Square | 9.669 | 1 | .002 | .002 |
| Continuity Correction | 8.233 | 1 | .004 | .004 |
| Likelihood Ratio | 10.376 | 1 | .001 | .001 |
| Fisher's Exact Test | 9.577 | 1 | .002 | .002 |
| Linear-by-Linear Association | 105 | 0.002 | .002 |

### ForestStructure * Country Crosstab

| ForestStructure | Country       |       |       |       |
|-----------------|---------------|-------|-------|-------|
|                 | Japan         | Indonesia | Total |       |
| 0               | 43            | 27     | 70    |       |
|                 | 36.7          | 33.3   | 70.0  |       |
| 1               | 12            | 23     | 35    |       |
|                 | 18.3          | 16.7   | 35.0  |       |
| **Total**       | **55**        | **50** | **105** |       |
|                 | **55.0**      | **50.0** | **105.0** |       |

###Chi-Square Tests

| Value        | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|--------------|----|-----------------------|----------------------|----------------------|
| Pearson Chi-Square | 6.892 | 1 | .009 | .009 |
| Continuity Correction | 5.847 | 1 | .016 | .016 |
| Likelihood Ratio | 6.968 | 1 | .008 | .008 |
| Fisher's Exact Test | 6.826 | 1 | .009 | .009 |
| Linear-by-Linear Association | 105 | .009 | .009 |
### ScenicView * Country Crosstab

|       | Japan | Indonesia | Total |
|-------|-------|-----------|-------|
| 0     | 45    | 31        | 76    |
| Expected Count | 39.8 | 36.2       | 76.0  |
| 1     | 10    | 19        | 29    |
| Expected Count | 15.2 | 13.8       | 29.0  |
| Total | Count | 55        | 50    | 105   |
|       | Expected Count | 55.0 | 50.0 | 105.0 |

#### Chi-Square Tests

|                        | Value   | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|------------------------|---------|----|-----------------------|----------------------|----------------------|
| Pearson Chi-Square     | 5.146   | 1  | .023                  |                      |                      |
| Continuity Correction  | 4.202   | 1  | .040                  |                      |                      |
| Likelihood Ratio       | 5.195   | 1  | .023                  |                      | .029                 |
| Fisher's Exact Test    |         |    |                       |                      | .020                 |
| Linear-by-Linear Assoc | 5.097   | 1  | .024                  |                      |                      |

### RecreationalSpace * Country Crosstab

|       | Japan | Indonesia | Total |
|-------|-------|-----------|-------|
| 0     | 33    | 46        | 79    |
| Expected Count | 41.4 | 37.6       | 79.0  |
| 1     | 22    | 4         | 26    |
| Expected Count | 13.6 | 12.4       | 26.0  |
| Total | Count | 55        | 50    | 105   |
|       | Expected Count | 55.0 | 50.0 | 105.0 |

#### Chi-Square Tests

|                        | Value   | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|------------------------|---------|----|-----------------------|----------------------|----------------------|
| Pearson Chi-Square     | 14.395  | 1  | .000                  | .000                 | .000                 |
| Continuity Correction  | 12.729  | 1  | .000                  |                      |                      |
| Likelihood Ratio       | 15.630  | 1  | .000                  |                      |                      |
| Fisher's Exact Test    |         |    |                       |                      | .000                 |
| Linear-by-Linear Assoc | 14.258  | 1  | .000                  |                      |                      |
| N of Valid Cases       | 105     |    |                       |                      |                      |
6) Landscape element and students’ attributes

| Case Processing Summary                             | Cases          |
|-----------------------------------------------------|----------------|
|                                                      | Valid | Missing | Total |
|                                                      | N     | Percent | N     | Percent | N     | Percent |
| UnderstoryPlant * PastLandscapeType * Country        | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| UnderstoryPlant * PresentLandscapeType * Country     | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| UnderstoryPlant * PastUrbanizationLevel * Country   | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| UnderstoryPlant * PresentUrbanizationLevel * Country| 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| UnderstoryPlant * ExperienceofJourney * Country     | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| UnderstoryPlant * Gender * Country                  | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| UnderstoryPlant * Age * Country                     | 103   | 98.1%   | 2     | 1.9%    | 105   | 100.0%  |
| Terrain * PastLandscapeType * Country                | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| Terrain * PresentLandscapeType * Country             | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| Terrain * PastUrbanizationLevel * Country           | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| Terrain * PresentUrbanizationLevel * Country        | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| Terrain * ExperienceofJourney * Country             | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| Terrain * Gender * Country                          | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| Terrain * Age * Country                             | 103   | 98.1%   | 2     | 1.9%    | 105   | 100.0%  |
| Trail * PastLandscapeType * Country                 | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| Trail * PresentLandscapeType * Country              | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| Trail * PastUrbanizationLevel * Country             | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| Trail * PresentUrbanizationLevel * Country          | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| Trail * ExperienceofJourney * Country               | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| Trail * Gender * Country                            | 105   | 100.0%  | 0     | .0%     | 105   | 100.0%  |
| Trail * Age * Country                               | 103   | 98.1%   | 2     | 1.9%    | 105   | 100.0%  |
| Habitable Condition                  | Valid |       | Missing |       | Total |       |
|-------------------------------------|-------|-------|---------|-------|-------|-------|
|                                      | N     | Percent | N | Percent | N | Percent |
| Creature * PresentLandscapeType *    | 105   | 100.0%  | 0 | .0%     | 105 | 100.0%  |
| Country                             |       |         |     |         |     |         |
| Creature * PastUrbanizationLevel *  | 105   | 100.0%  | 0 | .0%     | 105 | 100.0%  |
| Country                             |       |         |     |         |     |         |
| Creature * PresentUrbanizationLevel * | 105 | 100.0%  | 0 | .0%     | 105 | 100.0%  |
| Country                             |       |         |     |         |     |         |
| Creature * ExperienceofJourney *    | 105   | 100.0%  | 0 | .0%     | 105 | 100.0%  |
| Country                             |       |         |     |         |     |         |
| Creature * Gender * Country         | 105   | 100.0%  | 0 | .0%     | 105 | 100.0%  |
| Creature * Age * Country            | 103   | 98.1%   | 2 | 1.9%    | 105 | 100.0%  |
| Water * PastLandscapeType *         | 105   | 100.0%  | 0 | .0%     | 105 | 100.0%  |
| Country                             |       |         |     |         |     |         |
| Water * PresentLandscapeType *      | 105   | 100.0%  | 0 | .0%     | 105 | 100.0%  |
| Country                             |       |         |     |         |     |         |
| Water * PastUrbanizationLevel *     | 105   | 100.0%  | 0 | .0%     | 105 | 100.0%  |
| Country                             |       |         |     |         |     |         |
| Water * PresentUrbanizationLevel *  | 105   | 100.0%  | 0 | .0%     | 105 | 100.0%  |
| Country                             |       |         |     |         |     |         |
| Water * ExperienceofJourney *       | 105   | 100.0%  | 0 | .0%     | 105 | 100.0%  |
| Country                             |       |         |     |         |     |         |
| Water * Gender * Country            | 105   | 100.0%  | 0 | .0%     | 105 | 100.0%  |
| Water * Age * Country               | 103   | 98.1%   | 2 | 1.9%    | 105 | 100.0%  |
| ArtificialObject * PastLandscapeType * | 105 | 100.0%  | 0 | .0%     | 105 | 100.0%  |
| Country                             |       |         |     |         |     |         |
| ArtificialObject * PresentLandscapeType * | 105 | 100.0%  | 0 | .0%     | 105 | 100.0%  |
| Country                             |       |         |     |         |     |         |
| ArtificialObject * PastUrbanizationLevel * | 105 | 100.0%  | 0 | .0%     | 105 | 100.0%  |
| Country                             |       |         |     |         |     |         |
| ArtificialObject * PresentUrbanizationLevel * | 105 | 100.0%  | 0 | .0%     | 105 | 100.0%  |
| Country                             |       |         |     |         |     |         |
| ArtificialObject * ExperienceofJourney * | 105 | 100.0%  | 0 | .0%     | 105 | 100.0%  |
| Country                             |       |         |     |         |     |         |
| ArtificialObject * Gender * Country | 105   | 100.0%  | 0 | .0%     | 105 | 100.0%  |
| ArtificialObject * Age * Country    | 103   | 98.1%   | 2 | 1.9%    | 105 | 100.0%  |
| People * PastLandscapeType *        | 105   | 100.0%  | 0 | .0%     | 105 | 100.0%  |
| Country                             |       |         |     |         |     |         |
| People * PresentLandscapeType *     | 105   | 100.0%  | 0 | .0%     | 105 | 100.0%  |
| Country                             |       |         |     |         |     |         |
| People * PastUrbanizationLevel * Country | N       | Percent | N       | Percent | N       | Percent |
|-----------------------------------------|---------|---------|---------|---------|---------|---------|
| People * PresentUrbanizationLevel * Country | 105    | 100.0%  | 0       | .0%     | 105    | 100.0%  |
| People * ExperienceofJourney * Country | 105    | 100.0%  | 0       | .0%     | 105    | 100.0%  |
| People * Gender * Country               | 103    | 98.1%   | 2       | 1.9%    | 105    | 100.0%  |
| People * Age * Country                  | 103    | 98.1%   | 2       | 1.9%    | 105    | 100.0%  |

| Sky * PastLandscapeType * Country       | N       | Percent | N       | Percent | N       | Percent |
|-----------------------------------------|---------|---------|---------|---------|---------|---------|
| Sky * PresentLandscapeType * Country    | 105    | 100.0%  | 0       | .0%     | 105    | 100.0%  |
| Sky * PastUrbanizationLevel * Country   | 105    | 100.0%  | 0       | .0%     | 105    | 100.0%  |
| Sky * PresentUrbanizationLevel * Country| 105    | 100.0%  | 0       | .0%     | 105    | 100.0%  |
| Sky * ExperienceofJourney * Country     | 105    | 100.0%  | 0       | .0%     | 105    | 100.0%  |
| Sky * Gender * Country                  | 105    | 100.0%  | 0       | .0%     | 105    | 100.0%  |
| Sky * Age * Country                     | 103    | 98.1%   | 2       | 1.9%    | 105    | 100.0%  |

| UnderstoryPlant * PastLandscapeType * Country Crosstab |
|---------------------------------|---------------|---------------|---------------|---------------|
| Country                        | PastLandscapeType | Total | Count | Expected Count | Count | Expected Count | Count | Expected Count | Count | Expected Count | Count | Expected Count | Count | Expected Count |
| Plain                          | Mountain       | Coastal      | Basin        | Total         |
| Japan                          | 0              | 25           | 3            | 1             | 2     | 31            |       |               |       |               |       |               |
| UnderstoryPlant                |                |              |              |               |        |               |       |               |       |               |       |               |
| Count                          |                |              |              |               |        |               |       |               |       |               |       |               |
| 0                              |                |              |              |               |        |               |       |               |       |               |       |               |
| Expected Count                 |                |              |              |               |        |               |       |               |       |               |       |               |
| 1                              |                |              |              |               |        |               |       |               |       |               |       |               |
| Count                          |                |              |              |               |        |               |       |               |       |               |       |               |
| 0                              |                |              |              |               |        |               |       |               |       |               |       |               |
| Expected Count                 |                |              |              |               |        |               |       |               |       |               |       |               |
| Indonesia                      | 0              | 2            | 6            | 0             | 1     | 9             |       |               |       |               |       |               |
| UnderstoryPlant                |                |              |              |               |        |               |       |               |       |               |       |               |
| Count                          |                |              |              |               |        |               |       |               |       |               |       |               |
| 0                              |                |              |              |               |        |               |       |               |       |               |       |               |
| Expected Count                 |                |              |              |               |        |               |       |               |       |               |       |               |
| 1                              |                |              |              |               |        |               |       |               |       |               |       |               |
| Count                          |                |              |              |               |        |               |       |               |       |               |       |               |
| 0                              |                |              |              |               |        |               |       |               |       |               |       |               |
| Expected Count                 |                |              |              |               |        |               |       |               |       |               |       |               |

| Total                           |                |              |              |               |        |               |       |               |       |               |       |               |
| Count                          |                |              |              |               |        |               |       |               |       |               |       |               |
| 2                              |                |              |              |               |        |               |       |               |       |               |       |               |
| Expected Count                 |                |              |              |               |        |               |       |               |       |               |       |               |

| Total                           |                |              |              |               |        |               |       |               |       |               |       |               |
| Count                          |                |              |              |               |        |               |       |               |       |               |       |               |
| 2                              |                |              |              |               |        |               |       |               |       |               |       |               |
| Expected Count                 |                |              |              |               |        |               |       |               |       |               |       |               |

| Total                           |                |              |              |               |        |               |       |               |       |               |       |               |
| Count                          |                |              |              |               |        |               |       |               |       |               |       |               |
| 2                              |                |              |              |               |        |               |       |               |       |               |       |               |
| Expected Count                 |                |              |              |               |        |               |       |               |       |               |       |               |

| Total                           |                |              |              |               |        |               |       |               |       |               |       |               |
| Count                          |                |              |              |               |        |               |       |               |       |               |       |               |
| 2                              |                |              |              |               |        |               |       |               |       |               |       |               |
| Expected Count                 |                |              |              |               |        |               |       |               |       |               |       |               |

| Total                           |                |              |              |               |        |               |       |               |       |               |       |               |
| Count                          |                |              |              |               |        |               |       |               |       |               |       |               |
| 2                              |                |              |              |               |        |               |       |               |       |               |       |               |
| Expected Count                 |                |              |              |               |        |               |       |               |       |               |       |               |
### Chi-Square Tests

| Country        | Pearson Chi-Square | Likelihood Ratio | Linear-by-Linear Association | N of Valid Cases |
|----------------|--------------------|------------------|-------------------------------|-----------------|
| Japan          | 9.288              | 9.523            | 5.766                         | 55              |
| Indonesia      | 11.572             | 11.270           | 3.578                         | 50              |

| Country        | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|----------------|------------------------|----------------------|----------------------|
| Japan          | .026                   | .721                 | .486                 |
| Indonesia      | .021                   | .024                 | .022                 |

### Terrain * Gender * Country Crosstab

| Country        | Total Count | Expected Count | Male | Female | Total |
|----------------|-------------|----------------|------|--------|-------|
| Japan          | 55          | 55             | 24   | 19     | 43    |
| Indonesia      | 50          | 50             | 16   | 18     | 34    |

| Country        | Count | Expected Count | Male | Female | Total |
|----------------|-------|----------------|------|--------|-------|
| Japan          | 6     | 6              | 6    | 6      | 12    |
| Indonesia      | 13    | 6              | 9.3  | 6.7    | 16    |

### Chi-Square Tests

| Country        | Value    | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|----------------|----------|----|-----------------------|----------------------|----------------------|
| Japan          | .128     | 1  | .721                  | .721                 | .753                 |
| Indonesia      | 5.221    | 1  | .022                  | .022                 | .032                 |
| Country | Creature | Count | Expected Count | Expected Count | Expected Count | Expected Count | Expected Count | Expected Count |
|---------|----------|-------|----------------|----------------|----------------|----------------|----------------|----------------|
| Japan   | 0        | 32    | 3.2            | 12.0           | 1.1            | 6.0            | 44.0           | 44.0           |
|         | 1        | 0     | .7             | 12.0           | 1.1            | 6.0            | 15.0           | 15.0           |
|         |          | 25    | 20.7           | 16.0           | 10.0           | 13.0           | 37.0           | 37.0           |
| Indonesia| 0        | 25    | .7             | 3.0            | 0.8            | 2.2            | 3.0            | 3.0            |
|         | 1        | 0     | 12             | 10             | 7.1            | 7.1            | 14             | 14             |
|         |          | 12    | 7.1            | 14             | 8.3            | 8.3            | 21             | 21             |

**Chi-Square Tests**

| Country | Value | df | Asymp. Sig. (2-sided) |
|---------|-------|----|-----------------------|
| Japan   | 3.017 | 3  | .389                  |
| Indonesia| 8.853 | 2  | .012                  |

| Country | Creature | Count | Expected Count | Expected Count | Expected Count | Expected Count | Expected Count |
|---------|----------|-------|----------------|----------------|----------------|----------------|----------------|
| Japan   | 0        | 3     | 3.0            | 16             | 21             | 18.9           | 21.0           |
|         | 1        | 0     | .8             | 7.1            | 7.1            | 15.0           | 15.0           |
|         |          | 3     | 3.0            | 26             | 26             | 26.0           | 26.0           |
| Indonesia| 0        | 1     | .7             | 2.2            | 10.4           | 13.0           | 13.0           |
|         | 1        | 0     | .3             | 8.3            | 8.3            | 13.0           | 13.0           |
|         |          | 1     | 3.0            | 14.0           | 14.0           | 14.0           | 14.0           |
|         |          | 1     | 3.0            | 14.0           | 14.0           | 14.0           | 14.0           |
Chi-Square Tests

| Country | Value      | df | Asymp. Sig. (2-sided) |
|---------|------------|----|-----------------------|
| Japan   | Pearson Chi-Square | 3.614 | 2 | .164 |
|         | Likelihood Ratio   | 4.352 | 2 | .114 |
|         | Linear-by-Linear Association | .414 | 1 | .520 |
|         | N of Valid Cases   | 55 |           |
| Indonesia | Pearson Chi-Square | 9.882 | 3 | .020 |
|         | Likelihood Ratio   | 14.076 | 3 | .003 |
|         | Linear-by-Linear Association | 7.459 | 1 | .006 |
|         | N of Valid Cases   | 50 |           |

Water * PastUrbanizationLevel * Country Crosstab

| Country | PastUrbanizationLevel | 0 | City center | Urban area | Sub urban area | Rural area | Total |
|---------|------------------------|---|-------------|------------|----------------|------------|-------|
| Japan   | 0 Count                |   | 0           | 10         | 25             | 2          | 37    |
|         | Expected Count         |   | 1.3         | 8.1        | 23.5           | 4.0        | 37.0  |
|         | 1 Count                |   | 2           | 2          | 10             | 4          | 18    |
|         | Expected Count         |   | .7          | 3.9        | 11.5           | 2.0        | 18.0  |
|         | Total                  |   | 2           | 12         | 35             | 6          | 55    |
|         | Expected Count         |   | 2.0         | 12.0       | 35.0           | 6.0        | 55.0  |
| Indonesia | 0 Count               |   | 1           | 3          | 13             | 9          | 6     |
|         | Expected Count         |   | 2.6         | 3.2        | 14.7           | 7.7        | 3.8   |
|         | 1 Count                |   | 3           | 2          | 10             | 3          | 0     |
|         | Expected Count         |   | 1.4         | 1.8        | 8.3            | 4.3        | 2.2   |
|         | Total                  |   | 4           | 5          | 23             | 12         | 6     |
|         | Expected Count         |   | 4.0         | 5.0        | 23.0           | 12.0       | 6.0   |

Chi-Square Tests

| Country | Value      | df | Asymp. Sig. (2-sided) |
|---------|------------|----|-----------------------|
| Japan   | Pearson Chi-Square | 8.931 | 3 | .030 |
|         | Likelihood Ratio   | 9.215 | 3 | .027 |
|         | Linear-by-Linear Association | .299 | 1 | .585 |
|         | N of Valid Cases   | 55 |           |
| Indonesia | Pearson Chi-Square | 7.239 | 4 | .124 |
|         | Likelihood Ratio   | 9.125 | 4 | .058 |
|         | Linear-by-Linear Association | 6.256 | 1 | .012 |
|         | N of Valid Cases   | 50 |           |
## Sky * PresentUrbanizationLevel * Country Crosstab

| Country | PresentUrbanizationLevel | Count | Urban area | Sub urban area | Total |
|---------|--------------------------|-------|------------|----------------|-------|
| Japan   | 0                        | 3     | 24         | 23             | 50    |
|         | Expected Count           | 2.7   | 23.6       | 23.6           | 50.0  |
|         | 1                        | 0     | 2          | 3              | 5     |
|         | Expected Count           | .3    | 2.4        | 2.4            | 5.0   |
| Total   | Count                    | 3     | 26         | 26             | 55    |
|         | Expected Count           | 3.0   | 26.0       | 26.0           | 55.0  |
| Indonesia | Sky                        | 0     | 3          | 14             | 48    |
|         | Expected Count           | 1.0   | 2.9        | 13.4           | 48.0  |
|         | Count                    | 1     | 0          | 1              | 2     |
|         | Expected Count           | .0    | .1         | 1.3            | 2.0   |
| Total   | Count                    | 1     | 3          | 14             | 50    |
|         | Expected Count           | 1.0   | 3.0        | 14.0           | 50.0  |

### Chi-Square Tests

| Country | Pearson Chi-Square | df | Asymp. Sig. (2-sided) |
|---------|-------------------|----|-----------------------|
| Japan   | .550*             | 2  | .760                  |
|         | .812              | 2  | .666                  |
|         | .507              | 1  | .477                  |
| Indonesia | 24.772*           | 3  | .000                  |
|         | 7.895             | 3  | .048                  |
|         | 4.521             | 1  | .033                  |

### Case Processing Summary

| Cases | Valid | Missing | Total |
|-------|-------|---------|-------|
|       | N     | Percent | N     | Percent |
| MixedForest * PastLandscapeType * Country | 105  | 100.0%  | 0     | .0%     | 105 | 100.0% |
| MixedForest * PresentLandscapeType * Country | 105  | 100.0%  | 0     | .0%     | 105 | 100.0% |
| MixedForest * PastUrbanizationLevel * Country | 105  | 100.0%  | 0     | .0%     | 105 | 100.0% |
| MixedForest * PresentUrbanizationLevel * Country | 105  | 100.0%  | 0     | .0%     | 105 | 100.0% |
| Habit                | Valid: N | Percent | Missing: N | Percent | Total: N | Percent |
|----------------------|----------|---------|------------|---------|----------|---------|
| MixedForest *        | 105      | 100.0%  | 0          | .0%     | 105      | 100.0%  |
| ExperienceofJourney *Country |        |         |            |         |          |         |
| MixedForest * Gender * |        |         |            |         |          |         |
| MixedForest * Age * Country |        |         |            |         |          |         |
| NeedleafForest * PastLandscapeType * Country |        |         |            |         |          |         |
| NeedleleafForest * PresentLandscapeType * Country |        |         |            |         |          |         |
| NeedleleafForest * PastUrbanizationLevel * Country |        |         |            |         |          |         |
| NeedleafForest * PresentUrbanizationLevel * Country |        |         |            |         |          |         |
| NeedleafForest * ExperienceofJourney * Country |        |         |            |         |          |         |
| NeedleafForest * Gender * Country |        |         |            |         |          |         |
| NeedleafForest * Age * Country |        |         |            |         |          |         |
| BroadleafForest * PastLandscapeType * Country |        |         |            |         |          |         |
| BroadleafForest * PresentLandscapeType * Country |        |         |            |         |          |         |
| BroadleafForest * PastUrbanizationLevel * Country |        |         |            |         |          |         |
| BroadleafForest * PresentUrbanizationLevel * Country |        |         |            |         |          |         |
| BroadleafForest * ExperienceofJourney * Country |        |         |            |         |          |         |
| BroadleafForest * Gender * Country |        |         |            |         |          |         |
| BroadleafForest * Age * Country |        |         |            |         |          |         |
| Unknown * PastLandscapeType * Country |        |         |            |         |          |         |
| Unknown * PresentLandscapeType * Country |        |         |            |         |          |         |
| Unknown * PastUrbanizationLevel * Country |        |         |            |         |          |         |

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| Cases | Valid | Missing | Total |
|-------|-------|---------|-------|
|       | N     | Percent | N     | Percent | N     | Percent |
| Unknown * Country | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| Unknown * PresentUrbanizationLevel * Country | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| Unknown * ExperienceofJourney * Country | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| Unknown * Gender * Country | 103 | 98.1% | 2 | 1.9% | 105 | 100.0% |

### MixedForest * PresentLandscapeType * Country Crosstab

| Count | PresentLandscapeType | Total |
|-------|----------------------|-------|
|       | 0 | Plain | Mountain | Coastal | Basin |       |
| Japan | MixedForest 0 | Count | 1 | 37 | 4 | 5 | 47 |
|       | Expected Count | 0.9 | 37.6 | 3.4 | 5.1 | 47.0 |
|       | 1 | Count | 0 | 7 | 0 | 1 | 8 |
|       | Expected Count | 0.1 | 6.4 | 0.6 | 0.9 | 8.0 |
|       | Total | Count | 1 | 44 | 4 | 6 | 55 |
|       | Expected Count | 1.0 | 44.0 | 4.0 | 6.0 | 55.0 |
| Indonesia | MixedForest 0 | Count | 27 | 0 | 17 | 17 | 44 |
|       | Expected Count | 24.6 | 0.9 | 18.5 | 18.5 | 44.0 |
|       | 1 | Count | 1 | 1 | 4 | 4 | 6 |
|       | Expected Count | 3.4 | 1 | 2.5 | 2.5 | 6.0 |
|       | Total | Count | 28 | 1 | 21 | 21 | 50 |
|       | Expected Count | 28.0 | 1.0 | 21.0 | 21.0 | 50.0 |
### Chi-Square Tests

| Country     | Value         | df | Asymp. Sig. (2-sided) |
|-------------|---------------|----|-----------------------|
| Japan       | Pearson Chi-Square | 3  | .816                  |
|             | Likelihood Ratio     | 3  | .647                  |
|             | Linear-by-Linear Association | 1  | .817                  |
|             | N of Valid Cases    |    | 55                    |
| Indonesia   | Pearson Chi-Square | 2  | .006                  |
|             | Likelihood Ratio     | 2  | .022                  |
|             | Linear-by-Linear Association | 1  | .119                  |
|             | N of Valid Cases    |    | 50                    |

### MixedForest * PastUrbanizationLevel * Country Crosstab

| PastUrbanizationLevel | Country     | 0 Count | City center | Urban area | Sub urban area | Rural area | Total |
|-----------------------|-------------|---------|-------------|------------|----------------|------------|-------|
| Japan                 | MixedForest | 2       | 10          | 30         | 5              | 47         |
|                       |             | 1.7     | 10.3        | 29.9       | 5.1            | 47.0       |
|                       |             | 0       | 2           | 5          | 1              | 8          |
|                       |             | .3      | 1.7         | 5.1        | .9             | 8.0        |
|                       | Total       | 2       | 12          | 35         | 6              | 55         |
|                       |             | 2.0     | 12.0        | 35.0       | 6.0            | 55.0       |
| Indonesia             | MixedForest | 4       | 5           | 22         | 10             | 3          | 44    |
|                       |             | 3.5     | 4.4         | 20.2       | 10.6           | 5.3        | 44.0  |
|                       |             | 0       | 0           | 1          | 2              | 3          | 6     |
|                       |             | .5      | .6          | 2.8        | 1.4            | .7         | 6.0   |
|                       | Total       | 4       | 5           | 23         | 12             | 6          | 50    |
|                       |             | 4.0     | 5.0         | 23.0       | 12.0           | 6.0        | 50.0  |

### Chi-Square Tests

| Country     | Value         | df | Asymp. Sig. (2-sided) |
|-------------|---------------|----|-----------------------|
| Japan       | Pearson Chi-Square | 3  | .939                  |
|             | Likelihood Ratio     | 3  | .875                  |
|             | Linear-by-Linear Association | 1  | .795                  |
|             | N of Valid Cases    |    | 55                    |
| Indonesia   | Pearson Chi-Square | 4  | .027                  |
|             | Likelihood Ratio     | 4  | .053                  |
|             | Linear-by-Linear Association | 1  | .006                  |
|             | N of Valid Cases    |    | 50                    |
### FallenTrees * Age * Country Crosstab

|           | Age   |       |       |       |
|-----------|-------|-------|-------|-------|
|           | 19-27 | 28-36 | 37-45 | Total |
| FallenTrees | 0 Count | 54 | 1 | 55 |
|           | Expected Count | 54.0 | 1.0 | 55.0 |
| Total     | Count | 54 | 1 | 55 |
|           | Expected Count | 54.0 | 1.0 | 55.0 |

### Chi-Square Tests

| Country | Value | df | Asymp. Sig. (2-sided) |
|---------|-------|----|-----------------------|
| Japan   | Pearson Chi-Square | .4 |                       |
|         | N of Valid Cases    | 55 |                       |
| Indonesia | Pearson Chi-Square | 15.319 |    | .000 |
|         | Likelihood Ratio    | 5.902 |    | .052 |
|         | Linear-by-Linear Association | 13.776 |    | .000 |
|         | N of Valid Cases    | 48 |                       |

### 8) Spatial view and students’ attributes

### Sideway * PastLandscapeType * Country Crosstab

| Country | PastLandscapeType | 0      | Plain | Mountain | Coastal | Basin | Total |
|---------|------------------|--------|-------|---------|---------|-------|-------|
| Japan   | Sideway          | 0 Count | 24    | 10      | 2       | 2     | 38    |
|         |                  | Expected Count | 24.2 | 6.9     | 3.5     | 3.5   | 38.0  |
|         |                  | 1 Count   | 11    | 0       | 3       | 3     | 17    |
|         |                  | Expected Count | 10.8 | 3.1     | 1.5     | 1.5   | 17.0  |
|         |                  | Total     | 35    | 10      | 5       | 5     | 55    |
|         |                  | Expected Count | 35.0 | 10.0    | 5.0     | 5.0   | 55.0  |
| Indonesia | Sideway          | 0 Count   | 0     | 12      | 5       | 3     | 22    |
|         |                  | Expected Count | .9   | 13.6    | 2.6     | 2.6   | 22.0  |
|         |                  | 1 Count   | 2     | 19      | 1       | 3     | 3     |
|         |                  | Expected Count | 1.1  | 17.4    | 3.4     | 3.4   | 28.0  |
|         |                  | Total     | 2     | 31      | 6       | 6     | 5     |
|         |                  | Expected Count | 2.0  | 31.0    | 6.0     | 6.0   | 50.0  |
### Chi-Square Tests

| Country | Pearson Chi-Square | df | Asymp. Sig. (2-sided) |
|---------|--------------------|----|-----------------------|
| Japan   | 8.441              | 3  | .038                  |
|         | 10.987             | 3  | .012                  |
|         | 1.525              | 1  | .217                  |
| Indonesia | 5.811              | 4  | .214                  |
|         | 6.758              | 4  | .149                  |
|         | .777               | 1  | .378                  |

| Country | Continuity Correction | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---------|------------------------|-----------------------|----------------------|----------------------|
| Japan   | 3.529                  | .060                  | .031                 | .031                 |
|         | 4.716                  | .030                  |                      |                      |
|         | 4.673                  | .031                  |                      |                      |
| Indonesia | 1.479                 | .224                  |                      |                      |
|         | 2.509                  | .113                  |                      |                      |

### 9) Self-orientation and students’ attributes

#### SingleObject * ExperienceOfJourney * Country Crosstab

| Country | SingleObject | ExperienceOfJourney | Total |
|---------|--------------|--------------------|-------|
| Japan   | Domestic     | 6                  | 27    | 33    |
|         | Foreign country | 9.6              | 23.4  | 33.0  |
|         | Count        | 10                 | 12    | 22    |
|         | Expected Count | 6.4              | 15.6  | 22.0  |
|         | Count        | 16                 | 39    | 55    |
|         | Expected Count | 16.0              | 39.0  | 55.0  |
| Indonesia | Domestic     | 18                 | 8     | 26    |
|         | Count        | 20.3               | 5.7   | 26.0  |
|         | Expected Count | 18.7              | 5.3   | 24.0  |
|         | Count        | 39                 | 11    | 50    |
|         | Expected Count | 39.0              | 11.0  | 50.0  |

### Chi-Square Tests

| Country | Value | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---------|-------|----|-----------------------|----------------------|----------------------|
| Japan   | 4.760 | 1  | .029                  |                      |                      |
|         | 3.529 | 1  | .060                  |                      |                      |
|         | 4.716 | 1  | .030                  |                      |                      |
|         | 4.673 | 1  | .031                  |                      |                      |
| Indonesia | 2.427 | 1  | .119                  |                      |                      |
|         | 1.479 | 1  | .224                  |                      |                      |
|         | 2.509 | 1  | .113                  |                      |                      |
|                       | Value | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|-----------------------|-------|----|-----------------------|----------------------|---------------------|
| Fisher's Exact Test   |       |    |                       | .175                 | .111                |
| Linear-by-Linear Association | 2.379 | 1  | .123                  |                      |                     |
| N of Valid Cases b    |       |    |                       |                      |                     |

### ObjectiveScene * ExperienceOfJourney * Country Crosstab

| Country          | ExperienceOfJourney | Domestic | Foreign country | Total |
|------------------|---------------------|----------|-----------------|-------|
| Japan            | 0                   | 14       | 32              | 46    |
|                  | Expected Count      | 13.4     | 32.6            | 46.0  |
|                  | 1                   | 2        | 7               | 9     |
|                  | Expected Count      | 2.6      | 6.4             | 9.0   |
|                  | Total               | 16       | 39              | 55    |
|                  | Expected Count      | 16.0     | 39.0            | 55.0  |
| Indonesia        | 0                   | 34       | 6               | 40    |
|                  | Expected Count      | 31.2     | 8.8             | 40.0  |
|                  | 1                   | 5        | 5               | 10    |
|                  | Expected Count      | 7.8      | 2.2             | 10.0  |
|                  | Total               | 39       | 11              | 50    |
|                  | Expected Count      | 39.0     | 11.0            | 50.0  |

### Chi-Square Tests

| Country          | Value   | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|------------------|---------|----|-----------------------|----------------------|---------------------|
| Japan            | Pearson Chi-Square | .246  | 1 | .620                  |                      |                     |
|                  | Continuity Correction b | .009  | 1 | .924                  |                      |                     |
|                  | Likelihood Ratio    | .257  | 1 | .612                  |                      |                     |
|                  | Fisher's Exact Test |       |   |                       | 1.000                | .478                |
|                  | Linear-by-Linear Association | .242  | 1 | .623                  |                      |                     |
|                  | N of Valid Cases b   |       |   |                       |                      |                     |
| Indonesia        | Pearson Chi-Square | 5.711  | 1 | .017                  |                      |                     |
|                  | Continuity Correction b | 3.853  | 1 | .050                  |                      |                     |
|                  | Likelihood Ratio    | 5.011  | 1 | .025                  |                      |                     |
|                  | Fisher's Exact Test |       |   |                       | .030                 | .030                |
|                  | Linear-by-Linear Association | 5.597  | 1 | .018                  |                      |                     |
|                  | N of Valid Cases b   |       |   |                       |                      |                     |
### ScenicPlace * PastUrbanizationLevel * Country Crosstab

| Country | PastUrbanizationLevel | 0 | City center | Urban area | Sub urban area | Rural Area | Total |
|---------|------------------------|---|-------------|------------|---------------|------------|-------|
| Japan   |                        |   |             | 1          | 12            | 33         | 3     | 49.0 |
|         |                        |   | Expected    | 1.8        | 10.7          | 31.2       | 5.3   | 49.0 |
|         |                        | 1 | Count       | 1          | 0             | 2          | 3     | 6    |
|         |                        |   | Expected    | .2         | 1.3           | 3.8        | .7    | 6.0  |
|         |                        | Total | Count       | 2          | 12            | 35         | 6     | 55   |
|         |                        |   | Expected    | 2.0        | 12.0          | 35.0       | 6.0   | 55.0 |
| Indonesia |                    | 0 | Count       | 2          | 4             | 17         | 9     | 38   |
|         |                        |   | Expected    | 3.0        | 3.8           | 17.5       | 9.1   | 38.0 |
|         |                        | 1 | Count       | 2          | 1             | 6          | 3     | 12   |
|         |                        |   | Expected    | 1.0        | 1.2           | 5.5        | 2.9   | 12.0 |
|         |                        | Total | Count       | 4          | 5             | 23         | 12    | 50   |
|         |                        |   | Expected    | 4.0        | 5.0           | 23.0       | 12.0  | 50.0 |

### Chi-Square Tests

| Country | Value | df | Asymp. Sig. (2-sided) |
|---------|-------|----|-----------------------|
| Japan   |       |    |                       |
| Pearson Chi-Square | 15.019 | 3  | .002                  |
| Likelihood Ratio   | 11.485 | 3  | .009                  |
| Linear-by-Linear Association | 1.826 | 1  | .177                  |
| N of Valid Cases   | 55    |    |                       |
| Indonesia |       |    |                       |
| Pearson Chi-Square | 3.483 | 4  | .481                  |
| Likelihood Ratio   | 4.660 | 4  | .324                  |
| Linear-by-Linear Association | 2.119 | 1  | .145                  |
| N of Valid Cases   | 50    |    |                       |

### ScenicPlace * Age * Country Crosstab

| Country | Age | 19-26 | 27-35 | 36-44 | Total |
|---------|-----|-------|-------|-------|-------|
| Japan   |     |       |       |       |       |
| ScenicPlace | 0 | Count | 49    | 0     | 49    |
|         |   | Expected Count | 48.1 | 0.9   | 49.0 |
|         | 1 | Count | 5     | 1     | 6     |
|         |   | Expected Count | 5.9  | 0.1   | 6.0   |
|         | Total | Count | 54    | 1     | 55    |
|         |   | Expected Count | 54.0 | 1.0   | 55.0 |
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|                | 19-26 | 27-35 | 36-44 | Total |
|----------------|-------|-------|-------|-------|
| **ScenicPlace** |       |       |       |       |
| 0 Count         | 33    | 1     | 2     | 36    |
| 1 Count         | 11    | 0     | 1     | 12    |
| **Total**       | 44    | 1     | 3     | 48    |

### Chi-Square Tests

|                | Value  | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|----------------|--------|----|-----------------------|----------------------|----------------------|
| Japan Pearson Chi-Square | 8.318a | 1  | .004                  |                      |                      |
| Continuity Correctionb | 1.601  | 1  | .206                  |                      |                      |
| Likelihood Ratio      | 4.590  | 1  | .032                  |                      | .109                 |
| Fisher's Exact Test   |        |    |                       |                      | .109                 |
| Linear-by-Linear Association | 8.167 | 1  | .004                  |                      |                      |
| N of Valid Casesb     | 55     |    |                       |                      |                      |
| Indonesia Pearson Chi-Square | .444c | 2  | .801                  |                      |                      |
| Likelihood Ratio      | .680   | 2  | .712                  |                      |                      |
| Linear-by-Linear Association | .027  | 1  | .869                  |                      |                      |
| N of Valid Casesb     | 48     |    |                       |                      |                      |

10) Social meaning and students’ attributes

### Case Processing Summary

| Country * | N | Percent | N | Percent | N | Percent |
|-----------|---|---------|---|---------|---|---------|
| ForestStructure * | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| PastLandscapeType * | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| ForestStructure * | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| PresentLandscapeType * | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| ForestStructure * | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| PastUrbanizationLevel * | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| PresentUrbanizationLevel * | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| ForestStructure * | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| ExperienceOfJourney * | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| ForestStructure * | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
|                        | N  | Percent | N  | Percent | N  | Percent |
|------------------------|----|---------|----|---------|----|---------|
| ForestStructure * Age * Country | 103 | 98.1%   | 2  | 1.9%    | 105 | 100.0% |
| ScenicView * PastLandscapeType * Country | 105 | 100.0% | 0  | 0.0%    | 105 | 100.0% |
| ScenicView * PresentLandscapeType * Country | 105 | 100.0% | 0  | 0.0%    | 105 | 100.0% |
| ScenicView * PastUrbanizationLevel * Country | 105 | 100.0% | 0  | 0.0%    | 105 | 100.0% |
| ScenicView * PresentUrbanizationLevel * Country | 105 | 100.0% | 0  | 0.0%    | 105 | 100.0% |
| ScenicView * ExperienceOfJourney * Country | 105 | 100.0% | 0  | 0.0%    | 105 | 100.0% |
| ScenicView * Gender * Country | 105 | 100.0% | 0  | 0.0%    | 105 | 100.0% |
| ScenicView * Age * Country | 103 | 98.1%   | 2  | 1.9%    | 105 | 100.0% |
| RecreationalSpace * PastLandscapeType * Country | 105 | 100.0% | 0  | 0.0%    | 105 | 100.0% |
| RecreationalSpace * PresentLandscapeType * Country | 105 | 100.0% | 0  | 0.0%    | 105 | 100.0% |
| RecreationalSpace * PastUrbanizationLevel * Country | 105 | 100.0% | 0  | 0.0%    | 105 | 100.0% |
| RecreationalSpace * PresentUrbanizationLevel * Country | 105 | 100.0% | 0  | 0.0%    | 105 | 100.0% |
| RecreationalSpace * ExperienceOfJourney * Country | 105 | 100.0% | 0  | 0.0%    | 105 | 100.0% |
| RecreationalSpace * Gender * Country | 105 | 100.0% | 0  | 0.0%    | 105 | 100.0% |
| RecreationalSpace * Age * Country | 103 | 98.1%   | 2  | 1.9%    | 105 | 100.0% |
| SymbolicPlace * ExperienceOfJourney * Country | Valid | Missing | Total |
|-----------------------------------------------|-------|---------|-------|
| N | Percent | N | Percent | N | Percent |
| 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| SymbolicPlace * Gender * Country | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| SymbolicPlace * Age * Country | 103 | 98.1% | 2 | 1.9% | 105 | 100.0% |
| EcologicalSystem * PastLandscapeType * Country | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| EcologicalSystem * PresentLandscapeType * Country | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| EcologicalSystem * PastUrbanizationLevel * Country | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| EcologicalSystem * PresentUrbanizationLevel * Country | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| ForestryOperation * PastLandscapeType * Country | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| ForestryOperation * PresentLandscapeType * Country | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| ForestryOperation * PastUrbanizationLevel * Country | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| Lifeworld * PresentLandscapeType * Country | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| Lifeworld * PastUrbanizationLevel * Country | 105 | 100.0% | 0 | .0% | 105 | 100.0% |
| Country             | ForestStructure | PresentLandscapeType | Count | Expected Count | Total |
|---------------------|-----------------|----------------------|-------|----------------|-------|
| Japan               | 0               | Plain                | 1     | .8             | 1     |
|                     |                 | Mountain             | 35    | 34.4           | 35    |
|                     |                 | Coastal              | 1     | 3.1            | 4.7   |
|                     |                 | Basin                | 6     | 4.7            | 43.0  |
|                     | 1               | Count                | 1     | 2             | 2     |
|                     |                 | Expected Count       | 35    | 9.6           | 34.4  |
|                     |                 |                      | 1     | .9            | 35    |
|                     |                 |                      | 6     | 1.3           | 43.0  |
| Indonesia           | 0               | Count                | 1     | 1.0           | 1     |
|                     |                 | Expected Count       | 14    | 15.1          | 15.1  |
|                     |                 |                      | 0     | .5            | 0     |
|                     |                 |                      | 13    | 11.3          | 27.0  |
|                     | 1               | Count                | 1     | 12.9          | 14    |
|                     |                 | Expected Count       | 1     | .5            | 12.9  |
|                     |                 |                      | 8     | 9.7           | 23.0  |
| Total               | Count           |                      | 28    | 28.0          | 28    |
|                     | Expected Count  |                      | 1     | 1.0           | 1     |
|                     |                 |                      | 21    | 21.0          | 50.0  |

### Chi-Square Tests

| Country    | Value  | df | Asymp. Sig. (2-sided) |
|------------|--------|----|-----------------------|
| Japan      | Pearson Chi-Square | 8.634¹ | 3  | .035                 |
|            | Likelihood Ratio    | 8.623  | 3  | .035                 |
|            | Linear-by-Linear Association | .029  | 1  | .865                 |
|            | N of Valid Cases    | 55    |    |                       |
| Indonesia  | Pearson Chi-Square  | 1.883⁰ | 2  | .390                 |
|            | Likelihood Ratio    | 2.268  | 2  | .322                 |
|            | Linear-by-Linear Association | .720  | 1  | .396                 |
|            | N of Valid Cases    | 50    |    |                       |
### ScenicView * PastUrbanizationLevel * Country Crosstab

| Country | PastUrbanizationLevel | 0 | City center | Urban area | Sub urban area | Rural area | Total |
|---------|------------------------|---|-------------|------------|---------------|------------|-------|
| Japan   |                       | 0 | 11          | 30         | 4             | 45         |
|         | Expected Count         |   | 1.6         | 9.8        | 28.6          | 4.9        | 45.0  |
|         | 1                      |   | 2           | 1          | 5             | 2          | 10    |
|         | Expected Count         |   | .4          | 2.2        | 6.4           | 1.1        | 10.0  |
| Total   | Count                  |   | 2           | 12         | 35            | 6          | 55    |
|         | Expected Count         |   | 2.0         | 12.0       | 35.0          | 6.0        | 55.0  |
| Indonesia |                       | 0 | 3           | 13         | 8             | 5          | 31    |
|          | Expected Count         |   | 2.5         | 3.1        | 14.3          | 7.4        | 31.0  |
|          | 1                      |   | 2           | 2          | 10            | 4          | 19    |
|          | Expected Count         |   | 1.5         | 1.9        | 8.7           | 4.6        | 19.0  |
| Total   | Count                  |   | 4           | 5          | 23            | 12         | 50    |
|         | Expected Count         |   | 4.0         | 5.0        | 23.0          | 12.0       | 50.0  |

#### Chi-Square Tests

| Country | Value   | df | Asymp. Sig. (2-sided) |
|---------|---------|----|-----------------------|
| Japan   | Pearson Chi-Square | 11.065a | 3 | .011 |
|         | Likelihood Ratio   | 8.925   | 3 | .030 |
|         | Linear-by-Linear Association | .381 | 1 | .537 |
|         | N of Valid Cases   | 55      |    |    |
| Indonesia | Pearson Chi-Square | 1.816b | 4 | .770 |
|          | Likelihood Ratio   | 1.956   | 4 | .744 |
|          | Linear-by-Linear Association | 1.332 | 1 | .249 |
|          | N of Valid Cases   | 50      |    |    |

### ScenicView * PresentUrbanizationLevel * Country Crosstab

| Country | PresentUrbanizationLevel | 0 | City center | Urban area | Sub urban area | Total |
|---------|--------------------------|---|-------------|------------|---------------|-------|
| Japan   |                          | 0 | 24          | 20         | 45            |       |
|         | Expected Count           |   | 2.5         | 21.3       | 21.3          | 45.0  |
|         | 1                        |   | 2           | 2          | 6             | 10    |
|         | Expected Count           |   | .5          | 4.7        | 4.7           | 10.0  |
| Total   | Count                    |   | 3           | 26         | 26            | 55    |
|         | Expected Count           |   | 3.0         | 26.0       | 26.0          | 55.0  |
| Indonesia |                      | 0 | 8           | 22         | 31            |       |
|          | Expected Count           |   | .6          | 1.9        | 8.7           | 19.8  | 31.0  |
|          | 1                        |   | 2           | 6          | 10            | 19    |
|          | Expected Count           |   | .4          | 1.1        | 5.3           | 12.2  | 19.0  |
| Total   | Count                    |   | 1           | 14         | 32            | 50    |
|         | Expected Count           |   | 1.0         | 3.0        | 14.0          | 32.0  | 50.0  |
### Chi-Square Tests

| Country | Value | df | Asymp. Sig. (2-sided) |
|---------|-------|----|-----------------------|
| Japan   | Pearson Chi-Square | 7.083 | 2 | .029 |
|         | Likelihood Ratio | 6.144 | 2 | .046 |
|         | Linear-by-Linear Association | .011 | 1 | .916 |
|         | N of Valid Cases | 55 | |
| Indonesia | Pearson Chi-Square | 3.437 | 3 | .329 |
|         | Likelihood Ratio | 3.716 | 3 | .294 |
|         | Linear-by-Linear Association | 3.091 | 1 | .079 |
|         | N of Valid Cases | 50 | |

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### ScenicView * Age * Country Crosstab

| Country | Age | Total |
|---------|-----|-------|
|         | 19-26 | 27-35 | 36-44 | Total |
| Japan   |       |       |       |       |
| ScenicView | 0 Count | 45 | 0 | 45 | 45 |
|           | Expected Count | 44.2 | .8 | 45.0 | |
|           | 1 Count | 9 | 1 | 10 | |
|           | Expected Count | 9.8 | .2 | 10.0 | |
| Total    | Count | 54 | 1 | 55 | |
|           | Expected Count | 54.0 | 1.0 | 55.0 | |
| Indonesia | ScenicView | 0 Count | 29 | 0 | 1 | 30 |
|           | Expected Count | 27.5 | .6 | 1.9 | |
|           | 1 Count | 15 | 1 | 2 | 18 |
|           | Expected Count | 16.5 | .4 | 1.1 | |
| Total    | Count | 44 | 1 | 3 | 48 |
|           | Expected Count | 44.0 | 1.0 | 3.0 | 48.0 |

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### Chi-Square Tests

| Country | Value | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---------|-------|----|-----------------------|----------------------|----------------------|
| Japan   | Pearson Chi-Square | 4.583 | 1 | .032 | .182 | .182 |
|         | Continuity Correction | .693 | 1 | .405 | |
|         | Likelihood Ratio | 3.495 | 1 | .062 | |
|         | Fisher's Exact Test | 4.500 | 1 | .034 | |
|         | N of Valid Cases | 55 | |
| Indonesia | Pearson Chi-Square | 2.974 | 2 | .226 | |
|         | Likelihood Ratio | 3.227 | 2 | .199 | |
|         | Linear-by-Linear Association | 1.967 | 1 | .161 | |
### SymbolicPlace * PastUrbanizationLevel * Country Crosstab

| Country | SymbolicPlace | PastUrbanizationLevel | Total | Count | Urban area | Sub urban area | Rural area | Expected Count |
|---------|---------------|------------------------|-------|-------|------------|---------------|------------|----------------|
| Japan   | 0             | City center            | 2     | 12    | 35         | 5             | 54         | 2.0            |
|         |               | Expected Count         | 2.0   | 11.8  | 34.4       | 5.9           | 54.0       |
|         | 1             | Count                  | 0     | 0     | 0          | 1             | 1          | .0             |
|         |               | Expected Count         | .0    | .2    | .6         | .1            | 1.0        |
|         | Total         | Count                  | 2     | 12    | 35         | 6             | 55         | 2.0            |
|         |               | Expected Count         | 2.0   | 12.0  | 35.0       | 6.0           | 55.0       |
| Indonesia| 0             | Count                  | 4     | 5     | 23         | 12            | 6          | 4.0            |
|         |               | Expected Count         | 4.0   | 5.0   | 23.0       | 12.0          | 6.0        | 50.0           |
|         | Total         | Count                  | 4     | 5     | 23         | 12            | 6          | 4.0            |
|         |               | Expected Count         | 4.0   | 5.0   | 23.0       | 12.0          | 6.0        | 50.0           |

### Chi-Square Tests

| Country | Value | df | Asymp. Sig. (2-sided) |
|---------|-------|----|-----------------------|
| Japan   | 8.318 | 3  | .040                  |
|         | 4.590 | 3  | .204                  |
|         | 3.177 | 1  | .075                  |
|         | 55    |    |                       |
| Indonesia| .1   |    | .657                  |
|         | 50    |    |                       |

N of Valid Cases:
- Japan: 55
- Indonesia: 50
Appendix 4 The result of cluster analysis using SAS System for Windows 9.0

| Variable                  | Mean of Japanese Cluster |
|---------------------------|--------------------------|
|                           | 1    | 2    | 3    | 4    | 5    |
| Mixed forest              | 0.0000 | 0.0000 | 0.2500 | 0.3333 | 0.0714 |
| Needle leaf forest        | 0.5000 | 0.0833 | 0.1250 | 0.1111 | 0.2143 |
| Broadleaf forest          | 0.0000 | 0.6667 | 0.5000 | 0.3333 | 0.1429 |
| Unknown forest            | 0.5000 | 0.2500 | 0.1250 | 0.2222 | 0.5714 |
| Fallen trees              | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Understory plant          | 0.0000 | 0.3333 | 0.5000 | 0.3333 | 0.6429 |
| Terrain                   | 0.0000 | 0.2500 | 0.3750 | 0.0000 | 0.2143 |
| Trails                    | 0.0000 | 0.0000 | 0.2500 | 0.0000 | 0.9286 |
| Creature                  | 0.0000 | 0.0833 | 0.6875 | 0.0000 | 0.2143 |
| Water                     | 0.0000 | 1.0000 | 0.3750 | 0.0000 | 0.0000 |
| Artificial object         | 0.0000 | 0.0000 | 0.1250 | 0.0000 | 0.0714 |
| People                    | 1.0000 | 0.0000 | 0.4375 | 0.0000 | 0.3571 |
| Sky                       | 0.2500 | 0.1667 | 0.0000 | 0.0000 | 0.1429 |
| Close-up view             | 0.0000 | 0.3333 | 0.0625 | 0.6667 | 0.2857 |
| Sideway view              | 1.0000 | 0.2500 | 0.2500 | 0.2222 | 0.2857 |
| Bird eye view             | 0.0000 | 0.2500 | 0.4375 | 0.1111 | 0.2857 |
| Distant view              | 0.0000 | 0.1667 | 0.2500 | 0.0000 | 0.1429 |
| Single object             | 1.0000 | 0.0000 | 0.5625 | 1.0000 | 0.0000 |
| Objective scene           | 0.0000 | 0.5000 | 0.1250 | 0.0000 | 0.0714 |
| Surrounding place         | 0.0000 | 0.0000 | 0.3125 | 0.0000 | 0.9286 |
| Scenic place              | 0.0000 | 0.5000 | 0.0000 | 0.0000 | 0.0000 |
| Forest structure          | 0.0000 | 0.0833 | 0.0625 | 1.0000 | 0.0714 |
| Scenic view               | 0.0000 | 0.8333 | 0.0000 | 0.0000 | 0.0000 |
| Recreational space        | 1.0000 | 0.0000 | 0.4375 | 0.0000 | 0.7857 |
| Symbolic place            | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0714 |
| Ecological system         | 0.0000 | 0.0833 | 0.5000 | 0.0000 | 0.1429 |
| Forestry operation        | 0.0000 | 0.0000 | 0.0625 | 0.0000 | 0.0000 |
| Lifeworld                 | 0.0000 | 0.0000 | 0.0625 | 0.0000 | 0.0000 |
| Variable                  | Mean of Indonesian Cluster |
|---------------------------|----------------------------|
|                          | 1       | 2       | 3       | 4       |
| Mixed forest type         | 0.0000  | 0.0833  | 0.2353  | 0.0833  |
| Needle leaf forest        | 0.0000  | 0.0000  | 0.0000  | 0.0000  |
| Broadleaf forest          | 0.7778  | 0.7500  | 0.4118  | 0.5833  |
| Unknown forest            | 0.2222  | 0.1667  | 0.3529  | 0.2500  |
| Fallen trees              | 0.0000  | 0.0000  | 0.0000  | 0.0833  |
| Understory plant          | 0.7778  | 0.9167  | 0.8824  | 0.6667  |
| Terrain                   | 0.0000  | 0.5000  | 0.0000  | 0.8333  |
| Trails                    | 0.3333  | 0.0000  | 0.0000  | 0.8333  |
| Creatures                 | 0.7778  | 0.0833  | 0.0588  | 0.3333  |
| Water                     | 0.0000  | 1.0000  | 0.0000  | 0.5000  |
| Artificial object         | 0.0000  | 0.0000  | 0.0000  | 0.1667  |
| People                    | 0.0000  | 0.0000  | 0.0000  | 0.0000  |
| Sky                       | 0.0000  | 0.0833  | 0.0000  | 0.0833  |
| Close-up view             | 0.5556  | 0.0833  | 0.0000  | 0.0000  |
| Sideway view              | 0.4444  | 0.0000  | 1.0000  | 0.5833  |
| Bird eye view             | 0.0000  | 0.9167  | 0.0000  | 0.0833  |
| Distant view              | 0.0000  | 0.0000  | 0.0000  | 0.3333  |
| Single object             | 0.6667  | 0.0000  | 1.0000  | 0.0833  |
| Objective scene           | 0.4444  | 0.0000  | 1.0000  | 0.5833  |
| Surrounding place         | 0.0000  | 0.9167  | 0.0000  | 0.0833  |
| Scenic place              | 0.0000  | 0.0000  | 0.0000  | 0.3333  |
| Forest structure          | 0.4444  | 0.0000  | 1.0000  | 0.1667  |
| Scenic view               | 0.0000  | 1.0000  | 0.0000  | 0.5833  |
| Recreational space        | 0.3333  | 0.0000  | 0.0000  | 0.0833  |
| Symbolic place            | 0.0000  | 0.0000  | 0.0000  | 0.0000  |
| Ecological system         | 0.3333  | 0.0000  | 0.0000  | 0.1667  |
| Forestry operation        | 0.0000  | 0.0000  | 0.0000  | 0.0000  |
| Lifeworld                 | 0.0000  | 0.0000  | 0.0000  | 0.1667  |
BIOGRAPHY

The author, Prita Indah Pratiwi, was born in Bandung, October 9, 1989. The author is the first daughter of Ir Eddy Soliyadi and Ir Keni Kenranikanti. Her educational background consists of SMAN 1 Purwakarta from 2004-2006, bachelor program of IPB from 2006-2010, and double degree master program of IPB from 2011-2014 and Chiba University from 2012-2013. She had some experiences, like as trainee of traditional landscape management at historical park and villa in Kyoto, as one of speaker of Nature Exploration Workshop in Matsudo, and 1st Congress of Bogor Science Club in Bogor. She also ever took international internship at Natural Resource Planning Co., Ltd, Japan.

Moreover, she participated in various seminars, for example, IALI Symposium in Bogor, Japanese Institute of Landscape Architecture of Kanto Branch Meeting in Tsukuba, Korea-Japan Student Seminar on Landscape Planning Studies in Seoul. She was one of speakers in those seminars. She was also invited as a guest lecturer in Japan Geoscience Union Meeting in Chiba. In addition, she was the co-author of 1st Asia Parks Congress in Sendai.