THE DIFFERENCE IN PEOPLE'S RESPONSE TOWARD NATURAL LANDSCAPE BETWEEN UNIVERSITY STUDENTS OF JAPAN AND INDONESIA

(Perbedaan dalam Respon Manusia terhadap Lanskap Alami antara Pelajar Jepang dan Indonesia)

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Abstract

People in different culture distinguish in their response to the environment, especially in interpretation and understanding of the perceived landscape. In order to plan and manage the environment for the selection of landscape with the aim of special care, protection, and amenity, it is crucial that people effectively participate and measure the existing values which nature represents to local residents. The purpose of this study was to clarify the differences of landscape recognition of Japan and Indonesia and to find the landscape element which is highly valued. The study was conducted with the following six steps, namely, photos collection, photo grouping, preference evaluation, exoticism evaluation, analysis, and recommendation. Cluster analysis (Ward's method, squared Euclidean distance) was applied for the analysis of photo categories, and Mann-Whitney U Test was applied to examine the significant differences. In photo grouping, seven natural landscape photos of Japan and Indonesia were categorized in different groups. Forest photos were categorized as wetland by Japanese students. Two rivers, lake, and forest photos were categorized by Indonesian students, but Japanese students categorized it as forest and mountain in distant view. Japanese students also distinguished the wetland as wetland in distant view and wetland in close-up view. The results of preference evaluation show that significant differences were detected in 25 photos of 68 photos. The exoticism evaluation detected significant differences in 48 photos of 68 photos. Neither Japanese nor Indonesian students recognized forest and wetland. However, either the Japanese or Indonesian students preferred waterfall or coast than the others. Based on exoticism evaluation, river and wetland were not recognized, but coast and waterfall were recognized by both of countries. Both of countries shared commonality in landscape photographs evaluation of preference and exoticism, but differences had been found in landscape recognition based on the way of seeing landscape.

Keywords: environment perspetive, cluster analysis, exoticism, photo grouping, preference, landscape photographs.

Abstrak

Manusia dalam budaya yang berbeda membedakan respon mereka terhadap lingkungan, khususnya dalam interpretasi dan pemahaman lanskap yang dilihat atau dirasakan. Dalam rangka merencanakan dan mengelola lingkungan untuk pemilihan lanskap dengan tujuan perawatan khusus, perlindungan, dan kenyamanan, sangat penting bahwa manusia berpartisipasi secara efektif dan mengukur nilai-nilai eksisting yang alam berikan bagi penduduk lokal. Preferensi lanskap alami penting dalam perencanaan lanskap dari sudut pandang wisata. Tujuan dari penelitian ini adalah untuk mengklarifikasi perbedaan dalam pengenalan lanskap di Jepang dan Indonesia dan menemukans elemen lanskap yang dinilai tinggi. Penelitian ini dilaksanakan dengan enam tahapan, yaitu pengumpulan foto, pengelompokkan foto, evaluasi preferensi, evaluasi eksotisme, analisis dan rekomendasi. Analisis klaster (metode Ward, jarak Euclidian kuadrat) digunakan untuk analisis kelompok foto dan uji Mann-Whitney U digunakan untuk menguji perbedaan nyata. Dalam pengelompokan foto, tujuh foto lanskap alami di Jepang dan Indonesia dikelompokkan ke dalam grup yang berbeda. Foto hutan dikelompokkan sebagai lahan basah oleh pelajar Jepang. Dua foto sungai, danau, dan hutan dikelompokkan oleh pelajar Indonesia, tetapi pelajar Jepang mengelompokkannya sebagai hutan dan gunung pada jarak jauh. Pelajar Jepang juga membedakan lahan basah sebagai lahan basah pada jarak jauh dan lahan basah pada jarak dekat. Hasil evaluasi preferensi menunjukkan bahwa perbedaan nyata ditemukan pada 25 foto dari 68 foto. Evaluasi eksotisme menemukan perbedaan nyata dalam 48 foto dari 68 foto. Pelajar Jepang dan Indonesia tidak memilih hutan dan lahan basah. Namun, keduanya lebih memilih air terjun dan pesisir daripada jenis lanskap lainnya. Berdasarkan evaluasi eksotisme, sungai dan lahan basah tidak dipilih, sedangkan pesisir dan air terjun lebih dipilih oleh kedua negara. Kedua negara tersebut memiliki persamaan dalam

evaluasi preferensi dan eksotisme foto lanskap, tetapi perbedaan pun ditemukan dalam pengenalan lanskap yang didasarkan pada cara melihat lanskap.

Kata kunci: perspektif lingkungan, analisis klaster, eksotisme, pengelompokkan foto, preferensi, foto lanskap

INTRODUCTION

The recent diversifying and changing meanings of the natural environment and subject of consensus building appears most clearly. Since the Earth Summit in Rio de Janeiro in 1921, forest management has officially become a global topic. The lack of consensus on a balance between global, national and local demands becomes a major obstacle for the advancement of international cooperation in forest policy (Schmithüsen, 1995). 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 (Kleim and Wolf, 2007), such as amenity, ecotourism, conservation, even nature's health service (Knight, 2000; Li *et al.,* 2006)

It is crucial that peope effectively participate in landscape planning and management to measure the multiple functions and existing values that nature represents to local residents. Public participation methods reflect the local conditions, carry a lower cost than that 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 (Anonym, 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 natural landscape and focused on people's interpretation and understanding of the perceived landscape (Swaffield and Foster, 2000; Karjalainen and Tyrvälnen, 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). This landscape visual evaluation in non-western countries is rarely investigated.

Evaluating the preference and exoticism of natural landscapes is important for landscape planning and management from the view point of ecotourism. For the selection of landscapes for special care and protection, people should consider not only the biodiversity of species and the peculiarity of scientific knowledge, but also public preferences. In the context of global understanding, people in different cultures distinguish in their landscape preference due to historical, social, and living environment. Because of the differences in preference of seeing landscape, it is necessary to clarify the differences of landscape recognition between Japanese and Indonesian students and to find the characteristics of landscape elements that are highly assessed. The result of this study could become a guidance for landscape planning of ecotourism area in both countries,

EXPERIMENTAL METHOD

Data Collection and Sampling

Nowadays, the context of the selection of landscape and its element for ecotourism area, especially for conducting scenery evaluation, involves not only merely experts, but also students (Matsushima, 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 students selected was independent students 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).

According to Gay and Diehl (1992) *in* Wiyadi (2009), a very acceptable sample size depends on the type of research, namely: the sample size of

descriptive research at least 10% of the population, the sample size of correlational research at least 30 subjects, the sample size of causal-comparative research at least 30 subjects for each group, and 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: in each research, the sample size approximately 30 to 500 subjects and the sample size at least 30 subjects for each part. This research examined the significant difference between Japan and Indonesian students to recognize the landscape and found the characteristics of landscape elements that are highly assessed. 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 students as expressed by Gay and Diehl (1992), Roscoe (1975) and Fraenkel and Wallen (1993) *in* Wiyadi (2009).

Pre-survey

The pre-survey and survey were taken place during February until April 2013. The analysis and interpretation started from May until July 2014. This study had six steps in accomplishing the inventory, survey, and questionnaire stages, namely, photos selection, photo grouping, preference evaluation, exoticism evaluation, analysis, and recommendation (Figure 1).

Photo selection. Photo selection was conducted from 300 photos of natural landscape in Japan and Indonesia which has minimum dimension at least 1000x1000 pixels. The photos consisting the variation of landscape distance zone (foreground, middleground, and background) were selected. Then, 300 photos were categorized into 7 general groups based on landscape type in both countries,

Figure 1. Flow chart of study method

namely, waterfall, coast, river, lake, forest, mountain, and wetland. Finally, 68 photos in which about 10 photos (5 photos of Japan landscape and 5 photos of Indonesia landscape) in each landscape type printed in 2L size (127mm×180mm) were used.

Survey

Photo grouping. The students were asked to divide 68 photos into some groups by their scenic similarity. They were asked to give the number of photos which have scenic similarity from for to fourteen in each group. Then, they were also asked to label each group with a name

Preference evaluation. Students were asked to evaluate the scenic preference of each photo using 5 points scale (1: unpreferable to 5: preferable). Based on Sugiyono (2006), scoring category for preference based on Likert scale is from 1: highly unpreferable, 2: less preferable. 3: neutral/ good enough, 4: preferable, 5: highly preferable.

Exoticism evaluation. Students were asked to evaluate the exoticism of each photo using 3 points scale (-1: normal, 0: neutral, 1: exotic). Summated rating scale (Likert scale) is applied to distinguish between positive (favorable) and negative items (unfavorable) in scoring procedures (Faisal 2008).
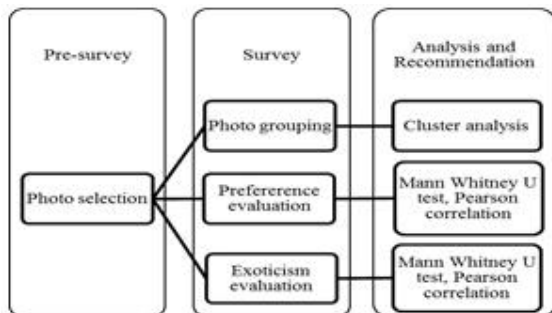
Analysis and Recommendation

Analysis used in estimation stage of previous research was divided into cluster analysis, Mann-Whitney U test, and Pearson correlation.

Cluster analysis. After 105 questionnaire sheets had been distributed and collected, cluster analysis using Ward's method and squared Euclidian distance was applied to analyze photo categories in each students group. The cluster analysis step was conducted as follows (Supranto, 2010) as follows: defining problem, choosing measure of distance, selecting clustering procedure, considering the number of cluster, and interpreting profile of cluster.

Mann-Whitney U test. Mann-Whitney U test was applied to test significant difference: between Japanese and Indonesian students' preferences evaluation and between Japanese and Indonesian students' exoticism evaluation. The results showed that there were significant differences between Japanese and Indonesian students in preferences and exoticism evaluation.

Pearson correlation. Pearson correlation was applied to examine the strength of linear dependence: between Japanese and Indonesian students' preference evaluation, between Japanese and Indonesian students' exoticism evaluation, between Japanese students' preference and

exoticism evaluation, and between Indonesian students' preference and exoticism evaluation.

Recommendation of this comparative study was formulated and derived from analysis above. The differences of recognizing the landscape would be natural landscape characters that might be useful as guidance for landscape planning of ecotourism area in Japan and Indonesia.

RESULTS AND DISCUSSION

Photo Grouping

The data was categorized by cluster analysis using Ward's method and squared Euclidean distance. Seven clusters were obtained in Indonesia, while nine clusters were obtained in Japan. Cluster analysis was applied to characterize natural landscape type. The primary point characterizing Japanese cluster was landform, viewpoint, and water element, while the primary point characterizing Indonesian cluster was normal viewpoint.

Characteristics of Japanese group

Japanese students distinguish landscape type into nine groups, namely, coast, forest, forest and mountain in distant view, lake, mountain, river, waterfall, wetland in distant view, wetland in close view (Figure 2). Seven photos were categorized into different groups in Japan and Indonesia. Forest landscape was categorized as wetland by the Japanese students because it consisted of high grass. Two rivers, forest, lake, and wetland were categorized by Indonesian students, but Japanese students categorized it as forest and mountain in distant view. Japanese students also distinguished the wetland as wetland in distant view and wetland in close up view.

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.

Characteristics of Indonesian group

Indonesian students distinguish landscape type into seven groups (Figure 3). They do not recognize wetland in distant view, wetland in close up view, forest in close up view, forest and mountain in distant view. Indonesian students viewed the whole landscape in a frame in normal viewpoint so that they do not recognize wetland which consists of close up and distant view. They did not combine two or more landscape type in each group.

Comparison between Japanese and Indonesian students' preference evaluation

The result of preference evaluation shows that there were significant difference in preference evaluation between Japanese and Indonesian
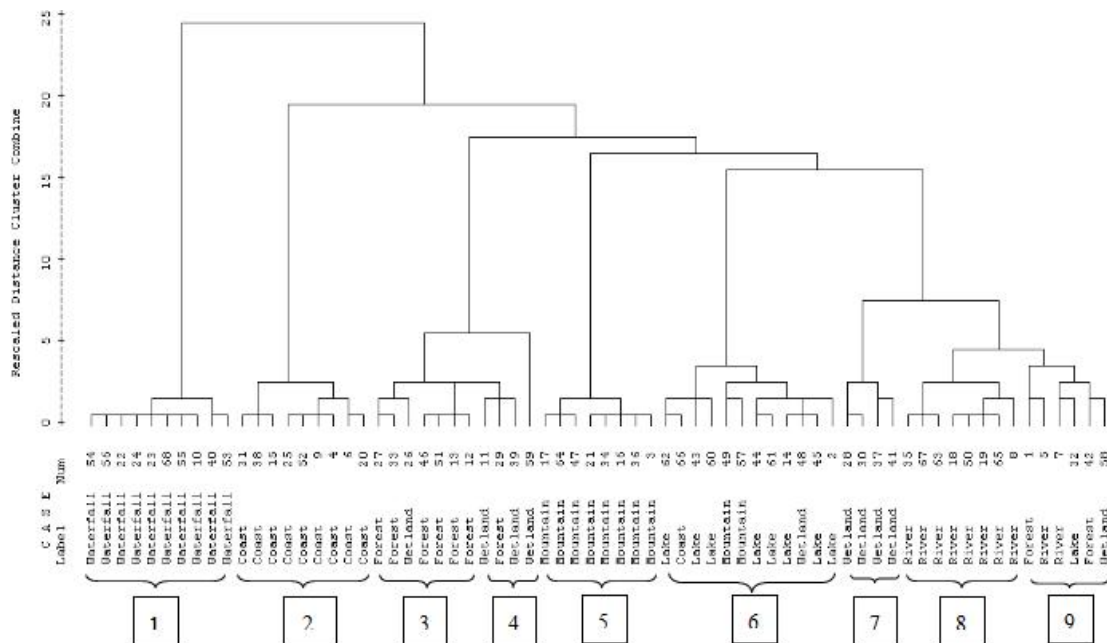
Figure 2. Dendogram of Japanese group. From left to right: 1.waterfall, 2.coast, 3. Forest, 4.wetland in close-up view, 5.mountain, 6.lake, 7.wetland in distant view, 8.river, dan 9.forest and mountain in distant view
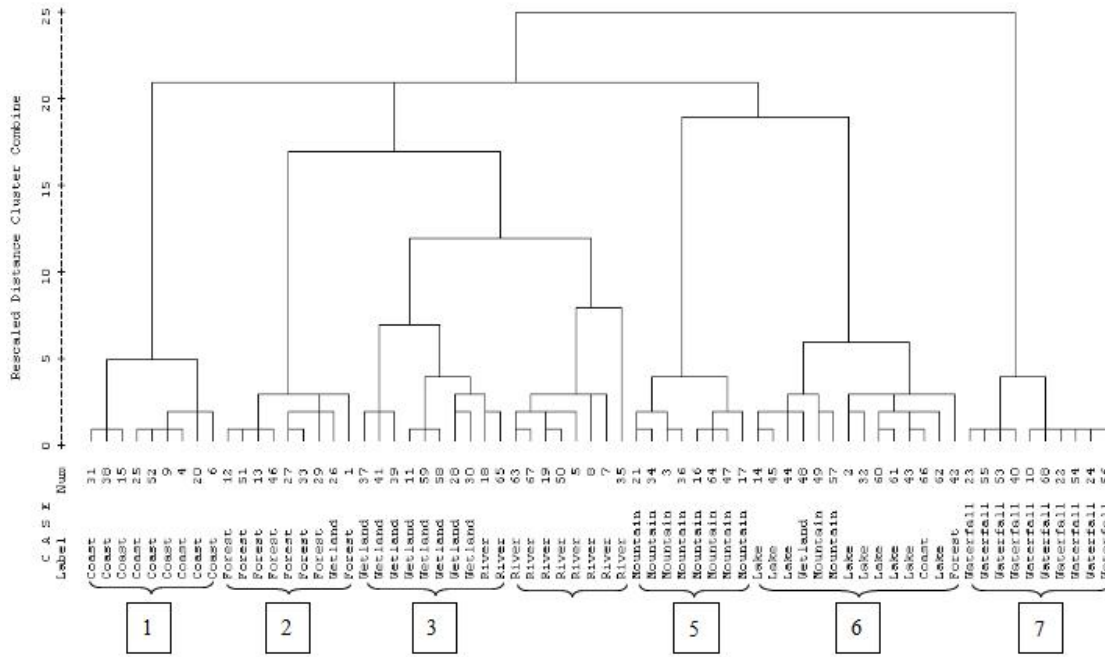
Figure 3. Dendogram of Indonesian group. From left to right: 1.coast, 2.forest, 3.wetland, 4.river, 5.mountain, 6.lake, and 7.waterfall

students detected in 25 photos of 68 photos, 17 were from Japan and 8 were from Indonesia. The highest significant differences were lake, river, wetland, and forest landscape. Figure 4 shows that the mean scores of landscape preferences between Japanese and Indonesian students with high correlation coefficient 0.832. Both countries preferred Indonesia's coast and waterfall landscape. On the other hand, wetland landscapes and forest landscapes were least preffered by both countries.

Unpreferred photos according to Japanese students were identified with low shadow and luminosity because Japanese students preferred bright and open forest (Takayama, 2013). While unpreferred photos according to Indonesian students were identified with homogenous element or without point of interest within the photos. These unpreferred photos had low score because they did not qualified as good formal aesthetic which is composed by good shape, color, complexity, and balance (Nasar, 1988).
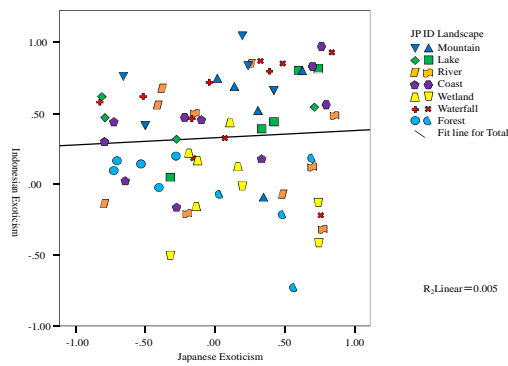
Comparison between Japanese and Indonesian students' exoticism evaluation

The result of exoticism evaluation shows that there were significant difference in exoticism evaluation between Japanese and Indonesian students detected in 48 photos of 68 photos, 28 were from Japan and 20 were from Indonesia. The significant differences were found in every landscape types. Figure 5 shows that the mean
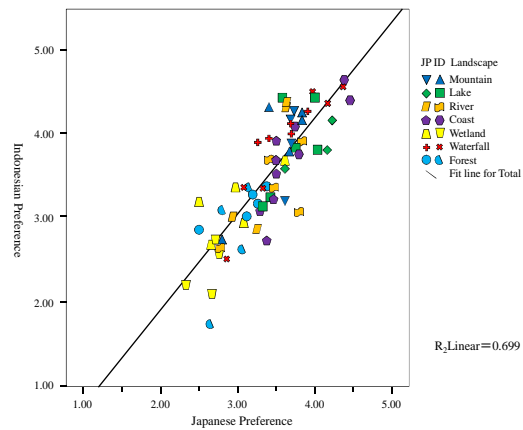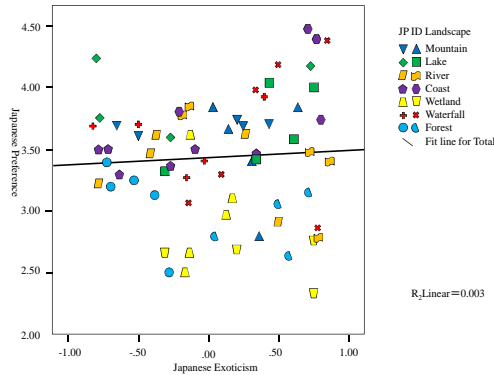

Figure 4. Correlations between Japanese and Indonesian preference scores

scores of landscape exoticism between Japanese and Indonesian students with low correlation coefficient 0.075. Japanese students felt exotic in Indonesian river, waterfall, and coast landscapes. Indonesian students also felt exotic in Indonesian waterfall, coast, Japanese mountain and river landscapes. The low correlation of exoticism evaluation between Japanese and Indonesian shows that there are opposite exoticism mean score between Japanese and Indonesian students, for example one of forest photos number was moderately scored by Japanese students (0.564), but it was marginally scored by Indonesian students (-0,74). Mountain photo was highly scored by Indonesian respondents (0.76), but it was marginally scored by Japanese students (-0.664).

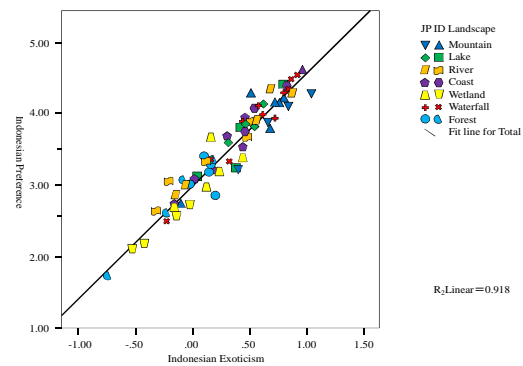**Figure 5**. Correlations between Japanese and Indonesian exoticism scores

Figure 6. Correlation between Japanese preference and exoticism scores

Figure 7. Correlation between Indonesian preference and exoticism scores

Correlation between preference and exoticism scores

Figure 6 shows that there were low correlation between preference and exoticism score of Japanese students (0.044). Japanese students liked the landscape based on their familiarity. They felt secure, safe, and comfortable and relaxed in environments which they are familiar to (Kaplan *et al.*, 1998). Whereas the correlation between preference and exoticism score of Indonesian students was high (0.956) and shown in Figure 7. It means that Indonesian students preferred exotic landscapes. Based on correlation between preference and exoticism score of Indonesian students, the concept of novelty and familarity could affect on preferences. If there is too much familiarity might become boring and people seek for novelty. Indonesian students liked unusual, exotic, huge, majestic, and never seen landscape in their tropical country.

Based on various, photo grouping, preference, and exoticism of natural landscape from cross-national perspectives, the implication of ecotourism planning could be discussed as recommendation. Having recognized the natural landscape in domestic region or foreign country, students or tourists could recognize and promote intercultural ecotourism based on the characters of natural landscape of their countries.

Long distant viewpoint for Japanese students and variety of viewpoint for Indonesian students could be considered in mapping the vantage point of a touring plan of ecotourism area. For ecotourism destination area, it would be better to plan and design according to tourists' preferences as follows coast, waterfall, and river landscape as the best recommended ecotourism destination for Japanese tourists who will visit Indonesia. Whereas mountain and river landscape were recommended for Indonesian tourists who will visit Japan. Furthermore, water element within natural landcape in each country has an important role in scenic beauty. It should be determined into planning and design of ecotourism area so that the scenic value in the natural landscape quality should be identified and conserved.

CONCLUSION

The primary point characterizing Japanese group was landform, viewpoint, and water element. Japanese students viewed the landscape in distant view which was dominated by horizon (background). The primary point characterizing Indonesian group was normal viewpoint. Indonesian students viewed the landscape in many viewpoints.

Japanese preference and exoticism primary point consisted of coast, waterfall, lake, river (water element), while Indonesian preference and exoticism primary point consisted of coast, waterfall, lake, river (water element) and mountain. Both of countries shared commonality in landscape photographs evaluation of preference and exoticism, but differences had been also found in recognition based on the way of seeing landscape.

REFERENCES

Anonym., 1982. National Conservation Plan for Indonesia, Introduction. UNDP/ FAO National Park Development Project, Bogor.

Cochrane, J., 2006. Indonesian National Parks: Understanding Leisure Users. *Annals of Tourism Research,* 33(4): 979–997.

Faisal, S., 2008. *Format-Format Penelitian Sosial.* PT Raja Grafindo Persada, Jakarta.

Finger-stich, A., 2005. Social Agency in Alpine Communal Forests—Local Actors' Interactions With Communal Forests and Participation in Communal Forestry in The French and Swiss Alps [dissertation]. University of Freiburg, Freiburg im Breisgau.

Fraenkel, J.R, and Wallen, N.E., 1993. *How to Design and Evaluate Research in Education.* McGraw-Hill Inc, Singapore.

Fujiwara, T., 2003. Public Participation in Japan's Forest Planning System. In: Inoue M, Isozaki H, editor. *People and Forest-Policy and Local Reality in Southeast Asia, the Russian Far East and Japan.* Kluwer Academic Publishers, Dordecht.

Gay, L.R, and Diehl, P.L., 1992. *Research Methods for Business and Management.* Macmillan, New York.

Kaplan, R., Kaplan, S., and Ryan, R.L., 1998. *With People in Mind*: *Design and Management of Everyday Nature.* Island Press, Washington DC.

Karjalainen, E., and Tyrvälnen L., 2002. Visualization in Forest Landscape Preference Research: A Finnish Perspective. *Landscape and Urban Planning*, 59: 13–28.

Kleim, J.A., and Wolf, S.A., 2007. Toward Multifunctional Landscapes: Cross-Sectional Analysis of Management Priorities in New York's Northern Forest. *Rural Sociology,* 72 (3): 391–417.

Knight, J., 2000. From Timber to Tourism: Recommoditizing The Japanese Forest. *Development and Change*, 31: 341–359.

Li, Q., Nakadai. A., Matsushima, H., Miyazaki, Y., Krensky, A.M, Kawada, T., and Morimoto, K., 2006. Phytoncides (Wood Essential Oils) Induce Human Natural Killer Cell Activity. *Immunopharmacol and Immunotoxicol,* 28: 319-333.

Marsden, T., 2003. Communities in Nature, The Construction and Understanding of Forest Natures. *Sociologia Ruralis*, 43(3): 238–256.

Matsushima, H., Petrova E.G., and Mironov, Y., 2013. Which Does Affect The Natural Landscape Appreciation Strongly, Cultural or Geological Difference? [abstract]. In: *Program Book of Japan Geoscience Union Meeting 2013*. Chiba, 19-24 May 2013.

Nasar, J.L., 1988. *Environmental Aesthetics: Theory, Study and Aplications*. Cambridge Univ Pr, New York.

Porteous, J.D., 1977. *Environment and Behavior: Planning and Everyday Urban Life*. Addison Wesley, United Kingdom.

Rannikko, P., 1999. Combining Social and Ecological Sustainability in The Nordic Forest Periphery. *Sociologia Ruralis,* 39(3): 394–411.

Ribe, R.G., 2002. Is Scenic Beauty A Proxy for Acceptable Management? The Influence of Environmental Attitudes on Landscape Perceptions. *Environment and Behavior*, 34(6): 757–780.

Roscoe, J., 1975. *Fundamental Research Statistics for The Behavioral Sciences*. Holt, Rinehart, and Winston, New York.

Ross, S., and Wall, G., 1999. Evaluating Ecotourism: The Case of North Sulawesi, Indonesia. *Tourism Management*, 20(6): 673–682.

Schmithüsen, F., 1995. The Meaning of Forests in A Perspective of Social and Political Development, Swiss Federal Institute of Technology, Department of Forest Sciences, Chair of Forest Policy and Forest, Zurich.

Sugiyono, 2006. *Statistika Untuk Penelitian*. CV Alfabeta, Bandung.

Supranto, J., 2010. *Analisis Multivariat: Arti dan Interpretasi*. Rineka Cipta, Jakarta.

Sutton, M., 2008. Japan, Mongolia and The Potential of Ecotourism. *Ritsumeikan International Study*, 21(1): 39–55.

Swaffield, S.R., and Foster R.J., 2000. Community Perceptions of Landscape Values in The South Island High Country: A Literature Review of Current Knowledge and Evaluation of Survey *Methods, Science for Conservation*, 159: 1–54.

Takayama, N., Petrova, E., Matsushima, H., Ueda, H., Furuya, K., and Aoki Y., 2013. Difference in and Causes of Environmental Attitudes between Russia and Japan [abstract]. In: *Program Book of Japan Geosciences Union Meeting 2013*. Chiba, 19-24 May 2013.

Ueda, H., 2009. A Study on Resident Landscape Perception through Landscape Image-Four Case Studies in Germany and Japan Rural Communities [dissertation]. University of Kassel, Kassel.

Van den Berg., A.E., and Koole, S.L., 2006. New Wilderness in The Netherlands: An Investigation of Visual Preferences for Nature Development Landscapes. *Landscape and Urban Planning*, 78: 362–372.

Whitten, A., and Whitten, J., 1992. *Wild Indonesia*. New Holland, London.

Wiyadi, 2009. Pengukuran Indeks Daya Saing Industri Kecil Menengah (IKM) di Jawa Tengah. *Jurnal Siasat Bisnis,* 1(13): 77–92.