



# Public awareness of aesthetic and other forest values associated with sustainable forest management: A cross-cultural comparison among the public in four countries



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## ABSTRACT

Korea, China, Japan and Canada are all members of the Montreal Process (MP). However, there has been little comparative research on the public awareness of forest values within the framework of Sustainable Forest Management, not only between Asia and Canada, but also among these three Asian countries. This is true of aesthetic values, especially as the MP framework has no indicator for aesthetic values. We conducted surveys to identify similarities and differences in the perceptions of various forest values, including aesthetic values, between residents of the four countries: university student groups in Korea, China, Japan and Canada, as well as a more detailed assessment of the attitudes of Koreans by including two additional groups, Korean office workers, and Koreans living in Canada. A multivariate analysis of variance test across the four university student groups revealed significant differences in the rating of six forest functions out of 31. However the same test across the three Korean groups indicated no significant differences indicating higher confidence in the generalizability of our university student comparisons. For the forest aesthetic values, an analysis of variance test showed no significant differences across all groups. The forest aesthetic value was rated 6.95 to 7.98 (out of 10.0) depending on the group and rated relatively highly among ten social values across all the groups. Thurstone scale rankings and relative distances of six major forest values indicated that climate change control was ranked as the highest priority and scenic beauty was ranked the lowest by all the groups. Comparison tests of the frequencies of preferred major forest values revealed no significant differences across the groups with the exception of the Japanese group. These results suggest that public awareness of aesthetic and other forest values are not clearly correlated with the cultural backgrounds of the individuals, and the Korean university students' awareness could potentially be representative of the Koreans general public's opinion. We expect this research to contribute to the development of aesthetic and social indicators, and to the enhancement of balancing social with environmental and economic values within the SFM framework.

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## 1. Introduction

Sustainable Forest Management (SFM) should balance environmental, economic and social values (Ferretti, 1997; McDonald and Lane, 2004; Toman and Ashton, 1996), yet many international SFM frameworks have been criticized for the lack of social and aesthetic criteria and indicators (C&I) (Gough et al., 2008; MCPFE, 2003; Meitner et al., 2006; MP, 2009; Sheppard et al., 2004). A lack of substantive public input to the development of the

indicators may be responsible for this omission (Lewis, 2005; Sheppard and Achiam, 2004), so it is important to understand the public's awareness of forest values when developing C&I of SFM that incorporate public values and participation (Bengston, 1994; Hunt and Haider, 2001; Sheppard et al., 2006).

To date, there have been many studies involving cross-cultural comparisons of forest aesthetics and scenic beauty. These studies have revealed potential differences in the ratings of landscape preferences between Western Australian and American students (Kaplan and Herbert, 1987), between Italian and Australian university students (Purcell et al., 1994), and between Yugoslavians, West Indians and Americans (Zube and Pitt, 1981). The results of these studies support the notion that public perception of scenic

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beauty may be partially the product of a socio-cultural construction and therefore may differ depending on an individual's knowledge, experience or cultural background. However, the studies of Purcell et al. (1994) and Zube and Pitt (1981) concern ratings for images of both built and natural phenomena. It is therefore possible that the cross cultural differences reported were inflated by the built landscapes which might be expected to differ more than ratings of natural landscapes. Other research has asserted a greater degree of similarity of aesthetic preferences; such as for the ratings for rural landscapes between western tourists and native Balinese (Hull and Reveli, 1989), for scenic areas between Chinese groups and a Western expert group (Yu, 1995), for urban street scenes between Japanese and students in the United States (Nasar, 1984), and for landscape styles between Koreans and western groups (Yang and Brown, 1992; Yang and Kaplan, 1990). Within a culture, children's ratings show greater similarity than adults (Balling and Falk, 1982). Based on the review of the previous studies, there are likely small but at times significant differences due to cultural backgrounds, but that there is also a great deal of similarity when considering landscape aesthetics in the context of SFM where natural landscapes are mostly dominant. These studies of cross-cultural comparisons have been primarily concerned with aesthetic judgments of specific built and natural landscape imagery rather than developing a more general understanding of the public's awareness of overall forest functions and services, including aesthetic values. This is particularly important when considering the creation of C&I at an international SFM level, as is required by the Montreal Process.

The purpose of this study is to investigate the perceived importance of various attributes of SFM and to identify similarities and differences in responses among individuals from a subset of Montreal Process member countries, namely Korea, China, Japan and Canada. We explore the awareness of university students from the four countries of forest functions and services, including aesthetic values, so as to reveal the role of cultural background in rating the importance and priorities of forest values in terms of SFM. We also assess the representativeness of the Korean university students sample in Korea by comparing results to those of Korean office workers in Korea and Koreans currently living in Canada.

## 2. Methods

### 2.1. Participants and delivery

We administered surveys to 68 office workers at two Korean companies and 139 Koreans who had lived in Vancouver, Canada for more than two years. The average Canadian residency of this last group of respondents was 6.2 years and their occupations were not only graduate students (25 out of 52) but included housewives (12), professors (5), researchers (4) and others (6). We also administered surveys to 469 undergraduate students in four countries; the Republic of Korea (Korea), the People's Republic of China (China), Japan and Canada in 2010. In total, there were 431 participants (Table 1).

All participants in these surveys were volunteers, and the overall response rate was 63.8%. University students majoring in forestry-related topics, such as forest resources management, landscape architecture or wood science, were excluded as we considered that their knowledge might introduce a bias in the results. The particular universities, companies and residents for this research were selected based on the need to balance a breadth of national and cultural groups and the practical constraints involved in accessing sample groups. The top priority for the selection of the organizations to survey was whether there were professors, students or workers willing to assist us in administering these surveys.

**Table 1**  
Characteristics of respondents.

Group	Nationality & occupation	Participant's organization	n <sup>a</sup>	n <sup>b</sup>	Survey mode
KoW	Korean office workers	Korea Airport Service	36	25	Email
		Kyobo Life Insurance	32	30	Email
KoC	Koreans living in Canada <sup>e</sup>	Residents in Vancouver	139	52	Email, IWS <sup>c</sup> , SAR <sup>d</sup>
KoS	Korean university students	Kangwon National University	70	70	SAR <sup>d</sup>
		Seoul National University	30	28	SAR <sup>d</sup>
CaS	Canadian university students	University of British Columbia	156	57	Email, IWS <sup>c</sup> , SAR <sup>d</sup>
ChS	Chinese university students	Zhejiang Shuren University	104	62	Email
		Hefei University of Technology	51	51	Email
JaS	Japanese university students	Waseda University	58	56	SAR <sup>d</sup>
Total			676	431	

<sup>a</sup> Number of distributions.

<sup>b</sup> Number of responses.

<sup>c</sup> Internet web survey.

<sup>d</sup> Survey administered by researcher in person.

<sup>e</sup> Koreans who were living in Vancouver, Canada more than 2 years.

Depending on survey conditions and participants' requirements, three survey modes were employed: internet web survey, in person interviews and an e-mail survey. The students at Kangwon National University and Seoul National University in Korea, Hefei University of Technology in China and Waseda University in Japan were asked during classes to participate in the email or in-person-interview surveys. Email surveys, internet web surveys and in-person-interview surveys were administered to the Canadian students at the University of British Columbia (UBC) and to the Koreans living in Canada group. 42 UBC students were solicited in two classes to participate in the in-person-interview survey, and the others in this group participated in the web survey or the e-mail survey. The respondents from Zhejiang Shuren University in China were all students from the department of business administration, and they participated in the email survey. We administered the email survey to Korean office workers at Korea Airport Service and Kyobo Life Insurance in Seoul, Korea, through the intra-net systems of those companies.

### 2.2. Questionnaire

The questionnaire consisted of two parts: (a) opinions about the importance of 4 forest services and 31 forest functions, and (b) beliefs about priorities for 6 major forest values. The questionnaire design was based on previous public surveys done in Canada (Harshaw et al., 2006; Kozak et al., 2008) and followed the Tailored Design Method presented by Dillman et al. (2009). The items that participants evaluated in relation to the first question were based on the Millennium Ecosystem Assessment (MEA, 2005). Participants were asked to rate four forest services and 31 functions using a 10 point scale of importance, and six major forest values were provided for the participants to make pair-wise comparisons (Table 2). The pair-wise comparisons presented a list containing paired forest values and requested respondents to choose their preferred options (Spetic et al., 2005). The phrase 'for future generations' was included in all the questions so that forest services, functions and values were evaluated in terms of SFM, and could be easily understood by the public.

The questionnaire and the consent form were first developed in English. A pre-test was conducted through a questionnaire survey

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