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Forest Certification Scheme; Perceptions and Willingness-to-pay of Consumers and Manufacturers in South Korea

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Abstract : This study was carried out to examine the perceptions of consumers and forest product manufacturers in South Korea about forest certification and to identify their willingness-to-pay for certified products by personal interviews. Sixteen percent of interviewees knew and heard about forest certification. However, fifty-six percent of interviewees had an intention to participate in forest certification system. The consumers' group can be described in relative terms as the male of 30 age bracket. The average price premium charged to consumers was higher than one paid to manufacturers, and thus manufacturers are willing to include the additional costs for certified products.

Keywords : *forest certification, certified wood products, awareness, willingness-to-pay and -charge, forest products manufacturers, consumers*

Introduction

Forest certification is a market-based tool to effectively manage forest by providing a market-incentive to timber producers. In general, forest, which is sustained ecologically, economically and socially by land owners, is evaluated by accredited certifying organizations, and the forest is certified with their locally developed and approved standards. Forest products from the certified, well-managed forest land can be flowed into the mainstream of environmentally sensitive forest products markets. End-consumers are recognized at which forest products come from a certified forest land by the label of certifying organizations.

In the early 1990s, forest certification have been initially realized as one of policies for helping to attain sustainable forest management, and then have extensively been publicized mainly by environmental groups. In present, markets in Europe and North America are increasingly demanding wood products came from certified forest. For example, the demand from the certified timber buyers' group only in United Kingdom (UK) is worth over US$ 4 billion per year, and the cost reaches at 18% of the total UK timber market (Scrase *et al.*, 1999). In addition, markets for certified forest products are growing rapidly in Western Europe and North America and starting to develop in Asia.

The forest land of South Korea, located in the temperate forest zone, is about 6.4 million hectare, and the forest area occupies 65.2% of the total land (KFRI, 2004). The total volume and annual growth of tree stands in the area are 448 and 20 million m^3, respectively (KFRI, 2003). According to the report of KFRI, two-million private owners possess approximately 70% of total forest land, and they provided 29 million m^3 timber, which is just the 6% of total round wood consumption in South Korea. The rest of the round wood required to make wood products were imported from abroad, such as Canada, New Zealand, United States, etc. In the report, it also was predicted that the demand of round wood will continue to increase as the economic situation of South Korea improves. In this circumstances, quite a few of forest products manufacturers were involved in manufacturing or purchasing certified wood products, and certified forest products had never been demanded in the market of South Korea (Joo & Lee, 2000). However, there has recently been a growing concern and interest in forest certification in South Korea according to the expansion of global markets for certified forest products.

Therefore, this study was conducted to: 1) examine the perceptions of consumers and forest product manufacturers in South Korea about forest certification; 2) iden-

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tify the willingness-to-pay of buyers for purchasing certified timbers or forest products; and 3) estimate the price premium paid and charged for certified timbers or wood products.

Methodology

The primary objective of this study was to examine the perceptions and awareness associated with forest certification for forest products consumers in South Korea. Data were collected in the spring of 2005. The examination was administered by personal interviews. The personal interview was conducted to complement the disadvantage of postal survey and telephone interview and to maximize response rates. The interviewees participated in this study were divided into forest product manufacturers and consumers.

Sample frames for collecting data from the companies in the wood products industry were developed from the Directory of wood products industry in South Korea (KFRI, 2003). Thirty-five sawmills, 24 furniture companies and 8 wood panel industries were interviewed for a total of 500 sawmills, 300 furniture companies and 17 wood panel industries. Most forest product manufacturers interviewed for this study were in the position of headquarters level, and thus they have greatly influenced to purchase wood-based materials and to sell their products.

For collecting data from consumers, 198 persons who are living at Seoul, Pusan and Daegu, which are the three largest cities in South Korea were interviewed. Based on the consumers who would be in the market for a range of certified forest products, only consumers over 18 years old were selected randomly. The 198 interviewees were comprised of 91, 55 and 52 persons in the city of Seoul, Pusan and Daegu, respectively. In addition, male (56%) slightly outnumbered female (44%) in the sample. The average age of interviewees was 35, with interviewees by age group as follows: 20 to 29-35 percent; 30 to 39-36 percent; 40 to 49-26 percent; over 50-3 percent. One hundred nine interviewees (55%) obtained a college degree, and 23 percent (45 interviewees) is a college student. Another 22 percent (44 interviewees) received only a high school education or less. Interviews were conducted at the paths leading to the top of mountains in each region.

Data were compiled by two-page questionnaire. Prior to the interview, it was necessary to explain the clear definition of forest certification for all interviewees due to the lack of information about forest certification. Forest certification was defined as a recently developed market-based tool for improving forest management by giving a market incentive to producers of timber products from well-managed forests (Ozanne & Vlosky, 1997). The questionnaire was divided into two sections: the awareness and attitude of forest certification and the willingness-to-pay for certified forest products. In the first section, interviewees were asked if they knew or heard about forest certification, whether they had an intention to participate in forest certification systems, and what the reasons are if they did not express an interest in participating forest certification systems. In the second section of two questions, interviewees were asked the willingness of them to charge and/or pay a price premium for certified wood-based materials and products, and the reason why consumers paid a price premium for certified forest products.

Mean responses were used to analyze the data on the questions included in the questionnaire. The examination of differences between forest product manufacturers and consumers was conducted using the analysis of variance (ANOVA). Significant differences with a $p < 0.05$ were further characterized by the multiple significant difference test (t-test). A 95% confidence level was used in all statistical tests.

Results and discussion

1. Awareness and attitude of forest products manufacturers and consumers on forest certification

Awareness of forest products manufacturers and consumers on forest certification is shown in Figure 1. Twenty-two percent of forest products manufacturers indicated that they knew or heard about forest certification. Regarding to the awareness for the each type of manufacturer, 14% sawmillers, 21% furniture manufacturers and 75% wood panel manufacturers were included in the group who knew or heard about forest certification. Wood panel manufacturers showed a higher awareness about forest certification than sawmillers and furniture manufacturers did. In the examination of forest certification awareness of 198 consumers, only 28 (14%) of the consumers knew or heard about forest certification. No significant differences of consumers' awareness about forest certification were found by region ($p=0.38$). According to the demographic profiles of 28 consumers who knew and heard about forest certification, the awareness of female (22%), university graduates or college student (15%), and the 20 age bracket (20%) was higher than male (9%), high school graduates (11%), and other age brackets. Importantly, no interviewees in the 50 age bracket knew and heard about forest certification. When compared the awareness of forest products manufacturers and consumers on forest certification, more forest products manufacturers knew about forest certification than consumers did. This result might be drawn

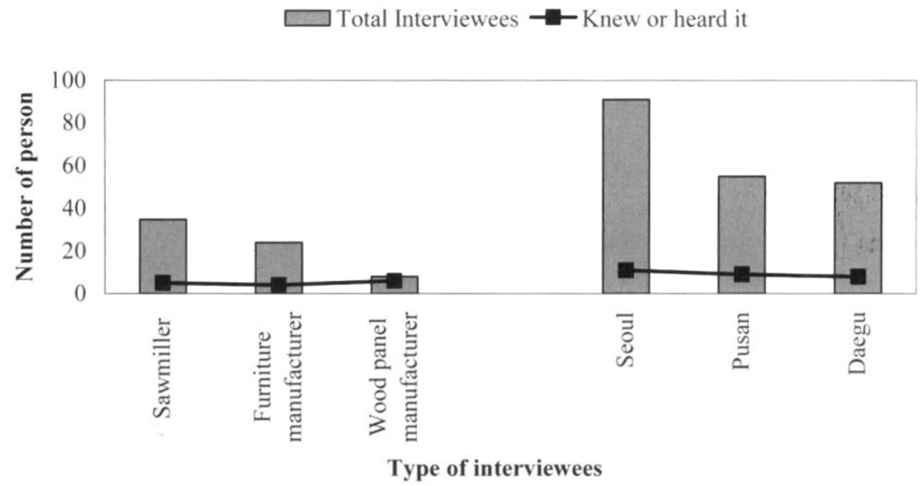

Figure 1. Awareness of forest products manufacturers and consumers on forest certification.

from the more opportunities for forest products manufacturers to gain information about the forest management practices and policies.

2. Willingness to participate in forest certification systems

Table 1 shows the willingness of forest products manufacturers and consumers for the participation of the forest certification. Of 67 forest products manufacturers, 26 (39%) indicated that they had an intention to participate in forest certification system. The primary reason for them to embrace forest certification was to concern about environment (34%). The second most important reason was to improve public image (22%). The other reasons were related to the price premium (12%), market accessibility (12%), customer demand (8%), niche market (8%), and others (4%). Forty one forest products manufacturers (61%) indicated that they were not interested in buying certified wood-based materials. The most important reason was to weaken the price competitiveness of their products (47%), followed by indifference of customers about certified wood products (16%) and the lack of trust of certified products (10%). Lack of awareness on forest certification (2%) and the limitation of market access (2%) were included in other reasons why they do not want to participate in the forest certification systems. Among forest products manufacturers, furniture manufacturers expressed a higher interest in the participation of forest certification system than sawmillers and wood panel manufacturers did (Table 1). These results are probably due to differences of price competitiveness among the products manufactured by them. For instance, furniture manufacturers have higher price margin than sawmillers and wood panel manufacturers, and thus might still have a price competitiveness of their products in spite of additional cost for certification.

For consumers, 123 (62%) indicated that they expressed an interest in participating in the forest certification sys-

Table 1. The willingness-to-pay of price premium for certified products.

	Total Interviewees	Participant	Percentage price premium			
			~5%	6~10%	11~20%	21%~
Forest products manufacturers						
Sawmill	35	11 (31%)	1	4	5	1
Furniture	24	12 (50%)	5	5		2
Wood panel	8	3 (38%)	2	1		
Subtotal	67	26 (39%)	8 (31%)	10 (38%)	5 (19%)	3 (12%)
Consumers						
Seoul	91	56 (62%)	11	24	17	4
Pusan	55	34 (62%)	14	16	1	3
Daegu	52	33 (63%)	15	15	2	1
Subtotal	198	123 (62%)	40 (33%)	55 (45%)	20 (16%)	8 (6%)
Total	265	149 (56%)	48 (32%)	65 (44%)	25 (17%)	11 (7%)

tems. Among them, most consumers (96%) indicated that, due to concern with environment, they were interested in the participation of forest certification systems. On the other hand, when asked why consumers do not participated in forest certification systems, the most important reasons were: 1) they are not indifferent to environment (53%); 2) they do not want to buy certified products which are increased its prices (30%); 3) they do not have any trusts of certified products (11%); and 4) they do not demand certified products (6%). In addition, when compared the willingness of participation in forest certification systems between forest products manufacturers and consumers, forest products manufacturers are not supportive of forest certification (Table 1). This result might be closely related to the increased price of certified products. In other words, additional cost of certification might be prohibitive factor for them to participate in forest certification systems.

3. Willingness to pay and charge a price premium for certified products

Table 1 shows how many percent interviewees are willing to pay a price premium for certified products. Among the 26 forest products manufacturers who expressed an interest in the participation of forest certification systems, 18 (69%) are willing to pay less than a 10 percent price premium for certified wood-based materials or products. Eight manufacturers may pay a price premium more than 10 percent to suppliers of certified products (31%). The average price premiums, to which sawmillers, furniture manufacturers and wood panel manufacturers are willing to pay for certified wood-based materials, were 13.64%, 10.38% and 3%, respectively. There was no significant difference of the price premiums between sawmillers and furniture manufacturers ($p=0.15$), but the price premiums of wood panel manufacturers are significantly lower than those of sawmillers ($p=0.01$) and furniture manufacturers ($p=0.01$).

Of 123 consumers who are willing to participate in forest certification systems, 55 consumers (45%) have an intention to pay a price premium of 6 to 10 percent for certified products; 40 consumers (33%) would pay a price premium less than 5 percent. Twenty consumers (16%) would pay 11 to 20 percent and 8 consumers (6%) would pay a price premium exceeding 20 percent. On average, there was no significant difference between forest products manufacturers (10.90%) and consumers (11.03%) to pay a price premium for certified wood products ($p=0.47$).

Table 2 provides the distribution of the percentage price premium in which forest products manufacturers are willing to charge for their certified products. In addition, the averages of the price premiums paid and charged for certified products by the interviewees, who are willing to participate in forest certification system, were also presented in the table. The price premiums of only interviewees who are willing to participate in the system forest were averaged for providing a market strategy for the certified products to forest products manufacturers. Among 26 manufacturers who answered positively in the participation of forest certification system, 10 manufacturers (38%) are willing to charge a price premium between 6 and 10 percent for their certified products. Forty-six percent of the manufacturers answered that they will charge a price premium more than 11 percent for their certified products, and 16% of the manufacturers are willing to charge less than a 5 percent premium. As shown in Table 2, the average price premium charged to buyers (15.38%) is higher than one paid to suppliers (10.90%). These results contradict the ones of other study that was done by Stevens *et al.* (1998). They surveyed the average price premiums paid and charged by 28 U.S. companies offering certified wood products in 1996. In their study, the average sales premium paid is higher than the average premium that the companies charged for their finished products. Based on the results of our study, although some forest products manufacturers in South Korea have a mind to participate forest certification systems for managing forest in a sustainable manner, they might consider forest certification system a mercenary method for selling their products.

Table 2. The percentage price premium paid to suppliers and charged to buyers for certified products.

Premium range (%)	Distribution of company by premium paid		Distribution of company by premium charged	
	Number of company	%	Number of company	%
~5	8	31	4	16
6~10	10	38	10	38
11~20	5	19	6	23
21~	3	12	6	23
Total	26	100	26	100
Average premium	10.90%		15.38%	

4. Characterization of consumers who are willing to participate in forest certification systems

In order to identify the characterization of consumers who are willing to participate in forest certification systems, the willingness of consumers' groups, which are classified by gender, region, age, and educational level, were compared, and the results are presented in Table 3. The willingness of female (67%) to participate in forest

Table 3. Comparison of consumers who are willing to participate in forest certification systems by demographic variables.

Variables		Consumers		
		Interviewees	Participant	Price Premium [a]
Gender	Male	111	65 (59%)	13.40% A
	Female	87	58 (67%)	8.38% B
Region	Seoul	91	56 (62%)	12.59% A
	Pusan	55	34 (62%)	10.41% AB
	Daegu	52	33 (63%)	9.03% A
Age	20-29	69	42 (61%)	9.38% B
	30-39	71	46 (65%)	12.26% A
	40-49	52	32 (62%)	9.66% AB
	50-	6	3 (50%)	30.00%
Education level	High school graduates	44	25 (57%)	10.44% A
	College/graduate student	45	27 (60%)	9.81% A
	University graduates	109	71 (65%)	11.70% A

[a]Means within a column followed by a same letter are not significantly different at p=0.05 (Least significance difference test).

certification systems was slightly higher than that of male (59%). Approximately 60 percent of consumers interviewed in three cities indicated that they have an intention to participate in the systems. The willingness of the 20, 30 and 40 age brackets were 61, 65 and 62 percent, respectively. There were little differences of the willingness to participate in forest certification systems among the age brackets with the exception of the 50 age bracket. Fifty percent of the 50 age bracket expressed an interest in the participation of forest certification systems, but the result of the 50 age bracket was not used in the statistical analysis due to lack of sample number. For the education level of consumers, slightly more university graduates and college students are willing to join in the forest certification systems than high school graduates.

Table 3 is also provided the comparison of percentage price premiums to which consumers are willing to pay for certified products. Male are willing to pay more a price premium than female (p=0.01). Regionally, consumers interviewed in Seoul are inclined to pay more a price premium than those in Taegu (p=0.02), but there were no significant differences of price premiums between Seoul and Pusan (p=0.12) and between Pusan and Taegu (p=0.27). By age, consumers in the 30 age bracket are willing to pay significantly higher a price premium than those in the 20 age bracket (p=0.04), but no significant differences between the 20 and 40 age brackets (p=0.42) and between the 30 and 40 age brackets (p=0.06) were found in the analysis of price premiums to which consumers are willing to pay for certified products. When the price premiums by education level were compared, no significant differences were found among three groups of education level, such as high school graduates, college students and university graduates. Although it was impossible to identify a characterization of consumers who are willing to participate in the forest certification systems, we can infer consumers who considered forest certification systems as a tool to sustainably manage forests from the results of this study. The consumers' group can be described in relative terms as most likely the male of 30 age bracket and residents who are living in Seoul.

Conclusion

The results of this study indicate that the awareness of forest products manufacturers and consumers on forest certification were low. However, consumers were more supportive of forest certification than the manufacturers. Importantly, there was no significant difference between forest products manufacturers and consumers to pay a price premium for certified products, but the average price premium charged to consumers was higher than one paid to manufacturers. Based on these results, the positive willingness of consumers to participate in a forest certification system might provide an increased market share potential for certified products and a motivation for selling their certified products to manufacturers. For the purpose, manufacturers need to inform consumers of the benefit and potential impact of forest certification systems for the sustainable management of forest. In addition, it needs to look out how such information might be changed the recognition of end-users about forest certification.

Literature Cited

1. Korea Forestry Research Institute. 2003. The fourth Forest Development Plan. Korea Forestry Research

Institute, Seoul, Korea (Korean).
2. Korea Forestry Research Institute. 2004. Statistical Yearbook of Forestry. Korea Forestry Research Institute, Seoul, Korea. http://www.foa.go.kr/2004 (September, 2004) (Korean)
3. Joo R.W. and S.Y. Lee. 2000. The potential impacts of recent developments in timber certification schemes on the Korean forest products trade. J. of Korean Forestry Society 89(3): 368-377 (Korean).
4. Ozanne L.K. and R.P. Vlosky. 1997. Willingness to pay for environmentally certified wood products: A consumer perspective. Forest Prod. J. 47(6): 39-48.
5. Scrase H., M.W. Smith, N. Judd, S. Higman, R.Nelson, and J. Jickling. 1999. Certification of forest products for small businesses: Improving access-issues and options. In final report of United Kingdom Department of International Development.
6. Stevens J., M. Ahmad, and S. Ruddell. 1998. Forest products certification: A survey of manufacturers. Forest Prod. J. 48(6): 43-49.

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