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# Reasons for Choosing Forest Stewardship Council (FSC) and Sustainable Green Ecosystem Council (SGEC) Schemes and the Effects of Certification Acquisition by Forestry Enterprises in Japan

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Received: 8 March 2018; Accepted: 27 March 2018; Published: 29 March 2018



**Abstract:** The Forest Stewardship Council (FSC) and the Sustainable Green Ecosystem Council (SGEC) are deployed as forest certification schemes in Japan. This study aimed to identify the reasons that enterprises choose the FSC or the SGEC scheme and the effects of certification. A questionnaire survey was conducted on 126 forestry enterprises with certification as of May 2014. The results of questionnaire tabulation found different reasons for choosing FSC (high reliability of the international certification system) or SGEC (examination costs and difficulty of acquisition, certification acquisition by neighboring enterprises in the region, and guidance and information from familiar people and enterprises). The results suggest that choosing FSC or SGEC depended on international or domestic emphasis, reliability, cost, and difficulty of acquisition. Both schemes reportedly improved management planning, environmental impact assessments, and monitoring, but increased timber value was not reported. Japanese consumers' understanding of forest certification should be enhanced and attention to forest management certification in Japan should increase because the SGEC now offers international certification. If SGEC certification is easier to obtain than FSC certification, and FSC is relatively expensive, the SGEC forest area should continue to expand.

**Keywords:** Forest Stewardship Council (FSC); Sustainable Green Ecosystem Council (SGEC); Program for the Endorsement of Forest Certification (PEFC); forest certification; questionnaire survey; sustainable forest management; forestry enterprise

## 1. Introduction

### 1.1. Background and Purpose

Since about 2000, sustainable forest management and forest certification systems have been attracting attention. Forest certification has the potential to address certain environmental problems, such as the setting of rules to manage forests sustainably and thus reduce the risks arising from environmental problems [1]. The Forest Stewardship Council (FSC) and the Program for the Endorsement of Forest Certification (PEFC), which are globally deployed as forest certification schemes, are increasingly used in Asia. In addition, some Asian countries have developed unique national forest certification schemes [2], such as the Indonesian Ecolabelling Institute and Indonesian Forestry Certification Cooperation (IFCC) in Indonesia, the Malaysian Timber Certification Council (MTCC) in Malaysia, and the China Forest Certification Council (CFCC) in China. All three—IFCC, MTCC, and CFCC—have mutual recognition with the PEFC.

In 2000, Hayami Forest was the first in Japan to obtain FSC forest management certification, and the Japanese Sustainable Green Ecosystem Council (SGEC) certification scheme was established

in 2003. By 2006, the SGEC area exceeded that of the FSC; in 2016, the FSC area was 390,000 ha, whereas the SGEC area was 1.56 million ha, about a fourfold difference [3]. The numbers of FSC- and SGEC-certified forest enterprises also increased, and, as of May 2014, FSC had 35 certified forest enterprises and SGEC had 92. FSC- and SGEC-certified forests in Japan have primarily spread in active timber production regions [4].

However, the proportion of certified forest area in Japan with international certification (FSC and PEFC) was as low as 2% in 2016 [3]. In contrast, more than 75% of Austria's, Finland's, Germany's, and Sweden's forested areas are certified forest [3]. About 50% of Canada's forested area is certified, and about 15% of that in the United States [3].

Previous studies have analyzed the corrective action request (CAR) of certification assessment, and studies have investigated certificate holders' experiences and CAR related to FSC and SGEC certification in Japan [5–11]. The studies revealed the most common CARs in FSC principles or SGEC standards to be as follows: management planning, environmental impact assessments, and monitoring. Sugiura et al. found that the extent of forest management in Japan was high compared to that of other Asian countries based on the numbers of CARs in global FSC certifications [12]. To the best of our knowledge, few studies have investigated the reasons for selecting a particular forest certification scheme, although forest certification is an important issue that should actively be discussed in Japan, which is the world's leading wood-importing country [13], and only a few studies have been carried out on forest certification in Japan. Moreover, on this point, the reasons for selecting FSC or SGEC certification are unknown.

It is also important to understand the costs related to certification and the effects of certification to predict the future of Japan's forest certification system from the perspective of the entity obtaining certification and to predict certification trends in countries with multiple certification schemes. To accomplish that, it is necessary to identify the various incentives for choosing a particular certification system from different certification enterprises.

Therefore, this study aimed to clarify the reasons that certified forest enterprises choose their schemes and the effects of certification on these enterprises. Through an analysis of questionnaire survey data, the present study helps in considering the future of forest certification schemes in Japan and responsive measures. It would probably also be useful for other countries with multiple certification schemes.

### 1.2. The FSC and SGEC Systems

The FSC system established in 1993 [14] has grown into a global certification scheme to support and verify environmentally, socially, and economically beneficial forest management practices. FSC certification bodies evaluate forests based on 10 FSC principles (Table 1) [15] organized as criteria. SGEC certification is a version of the FSC system specifically developed for forest certification in Japan in 2003. The purpose of establishing the SGEC certification system was to create a framework for forest certification tailored to the specific characteristics of Japanese forests and forestry [16]. SGEC certification bodies evaluate forests based on seven SGEC standards (Table 1) [17] comprised of indicators. Both certifications are valid for five years and include annual audits. The certification schemes comprise forest management certification and chain of custody certification. Wood distribution and processing enterprises must undergo chain of custody certification to distribute their products with their logos. In March 2015, SGEC applied for mutual recognition with PEFC, which was approved in June 2016 [18].

Because the the SGEC offers international certification through mutual certification with the PEFC, there are no conflicts between the FSC and SGEC when a request is made from the SGEC for internationally certified materials for public works. According to Gomez-Zamalloa et al., the FSC scheme is apparently the best suited to public ownership, whereas the PEFC fits private property, which seems reasonable considering that the PEFC scheme was initially proposed by private enterprises and the industry in response to the FSC, and it sought, among other objectives, to minimize costs [19].

The FSC also has a program for smallholders, although it has not achieved the same success, probably because of its strict requirements and high costs [19].

Forest certification schemes provide incentives for producers to improve forestry practices and a mechanism that informs consumers of some product characteristics [20]. However, Japan's Ministry of Agriculture, Forestry and Fisheries found that 66.9% of surveyed consumers reported, "I do not know the meaning of forest certification" or "I have never seen a logo" [21]. Thus, awareness of forest certification in Japan is low, and it is quite possible that consumers have little interest in the FSC and SGEC schemes.

**Table 1.** Ten FSC principles and seven SGEC standards.

FSC Principles		SGEC Standards	
1	Compliance with laws	1	Identification of forests and management policies
2	Workers' rights and employment conditions	2	Conservation of biological diversity
3	Indigenous peoples' rights	3	Conservation and maintenance of soil and water resources
4	Community relations	4	Maintenance of productivity and health of forest ecosystem
5	Benefits from the forest	5	Legal and institutional framework for sustainable forest management
6	Environmental values and impacts	6	Maintenance and promotion of social and economic benefits
7	Management planning	7	Monitoring and disclosure of information
8	Monitoring and assessment		
9	High conservation values		
10	Implementation of management activities		

FSC: Forest Stewardship Council; SGEC: Sustainable Green Ecosystem Council.

## 2. Materials and Methods

A 10-item questionnaire was developed to identify the reasons for obtaining forest management certification, the choice of FSC or SGEC, and the effects of certification on the enterprises. The data were collected through a survey of 126 forestry enterprises with either FSC or SGEC forest management certification as of May 2014 [22,23]. Of those, 34 had FSC certification, 91 had SGEC certification, and 1 enterprise was listed as having obtained both certifications (though we later discovered there were in fact two others, giving a total of 3 with both forms of certification). The questionnaire survey was conducted by mail (the survey was sent out on 17 October 2014 and the deadline for accepting responses was 8 November). Sixty-three questionnaires were returned (50% response rate). The analysis was descriptive and comparative. Responses to the open-ended questions were classified by the researchers, and comparisons were made using the two-sided Fisher's exact test (SPSS statistical software, version 22, International Business Machines Corp., NY, USA). We conducted an exact test between the enterprises who chose FSC and those who chose SGEC since the sample size of the enterprises who had obtained both certifications was small. Differences were deemed statistically significant at  $p < 0.05$ . Table 2 provides the questionnaire's content.

**Table 2.** Questionnaire content.

Question Number	Item Text
1	Which of the forest certification systems was required?
2	What was the reason for obtaining forest management certification?
3	Why did you choose the particular certification system?
4	Why did you choose the particular certification body?
5	What are the areas of improvement after certification?
6	What were any other effects of certification?
7	What are you dissatisfied with regarding certification?
8	How much did certification cost?
9	Did your enterprise experience any economic effects from certification?
10	Do you want to update your certification in the future?

### 3. Results

#### 3.1. Reasons for Obtaining Forest Certification

In the sample, 13 forestry enterprises had obtained FSC certification, 47 had obtained SGEC certification, and 3 forestry enterprises had obtained both certifications (we have attributed the discrepancy between the listed and the actual number of dual-certification companies to delays in updating the lists).

The reasons for obtaining forest management certification provided as responses to an open-ended question were organized into 17 categories, as shown in Table 3. Regardless of the type of certification, the most common reasons were to implement “sustainable forest management” and to realize “increased profit”. Other relatively common reasons were “outside appeal”, “differentiation and branding”, and “favorable marketing and utilization promotion”. The frequencies of reasons differed by certification scheme. Enterprises with FSC certification were most likely to choose “outside appeal”, followed by “third-party certification”, “sustainable forest management”, “differentiation and branding”, and “increased profit”. The enterprises with SGEC certification were most likely to choose “sustainable forest management”, followed by “increased profit”, and the enterprises with both certifications were most likely to choose “outside appeal” followed by “regional approach”, and “increased profit”. Statistically significant differences were found in “outside appeal” ( $p < 0.05$ ), which has asterisk in Table 3: The FSC certification acquisition enterprises considered “outside appeal” as a factor much more strongly than did those acquiring SGEC certification.

**Table 3.** Reasons for obtaining forest management certification.

Reason	FSC	SGEC	FSC and SGEC	Total
	( <i>n</i> = 13)	( <i>n</i> = 47)	( <i>n</i> = 3)	( <i>n</i> = 63)
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
Third-party certification	4 (31)	4 (9)	0 (0)	8 (13)
Sustainable forest management	4 (31)	14 (30)	1 (33)	19 (30)
Outside appeal *	5 (38)	5 (11)	2 (67)	12 (19)
Improvement of employee awareness	1 (8)	3 (6)	0 (0)	4 (6)
Improvement of management level	2 (15)	3 (6)	1 (33)	6 (10)
Differentiation and branding	4 (31)	8 (17)	0 (0)	12 (19)
Regional approach	2 (15)	4 (9)	2 (67)	8 (13)
Expectations for selective purchase	0 (0)	3 (6)	1 (33)	4 (6)
Increased profit	4 (31)	12 (26)	2 (67)	18 (29)
Social responsibility	2 (15)	4 (9)	0 (0)	6 (10)
Favorable marketing and utilization promotion	3 (23)	8 (17)	1 (33)	12 (19)
Image improvement	0 (0)	1 (2)	0	1 (2)
Forest certification	0 (0)	2 (4)	0	2 (3)
External guidance and request	1 (8)	3 (6)	0	4 (6)
Match direction	0 (0)	2 (4)	0	2 (3)
Carbon offset	0 (0)	2 (4)	0	2 (3)
Other	1 (8)	2 (4)	0	3 (5)

Statistical test  $p$  value between Forest Stewardship Council (FSC) and Sustainable Green Ecosystem Council (SGEC) excluding holders of both certifications: \* =  $p < 0.05$ .

#### 3.2. Reason for Choosing FSC, SGEC, or Both

The reasons provided by the respondents for choosing their particular certifications were grouped into 13 types (Table 4). The main reasons for choosing FSC certification were “international scheme” and “credibility”, and the main reason for choosing SGEC certification was that it is a “Japan-specific scheme”. Other reasons were “assessment costs”, “extent of difficulty”, “certification acquisition by neighboring enterprises in the region”, and “guidance and information from familiar people and enterprises”. The reasons for choosing both certifications were “certification acquisition by

neighboring enterprises in the region”, “guidance and request”, “credibility”, and “advantage”. Statistically significant differences were found regarding “Japan-specific scheme”, “international scheme”, “credibility”, and “outside appeal” ( $p < 0.05$ ), which have asterisk in Table 4. That is, the reason for choosing FSC certification strongly considered “international scheme”, “credibility”, and “outside appeal” more than the SGEC certification acquisition enterprises, while the main reason for choosing SGEC certification was “domestic scheme”.

**Table 4.** Reasons for choosing FSC, SGEC, or both certifications.

Reason	FSC	SGEC	FSC and SGEC	Total
	( <i>n</i> = 13)	( <i>n</i> = 47)	( <i>n</i> = 3)	( <i>n</i> = 63)
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
Japan-specific scheme *	0 (0)	16 (34)	0 (0)	16 (25)
International scheme *	9 (69)	0 (0)	0 (0)	9 (14)
Assessment costs	0 (0)	6 (13)	0 (0)	6 (10)
Extent of difficulty	0 (0)	7 (15)	0 (0)	7 (11)
Sympathy with the certification policy	0 (0)	4 (9)	0 (0)	4 (6)
Certification acquisition by neighboring enterprises in the region	0 (0)	8 (17)	1 (33)	9 (14)
Guidance and information from familiar people and enterprises	0 (0)	9 (19)	0 (0)	9 (14)
Guidance and request	0 (0)	2 (4)	1 (33)	3 (5)
Needs	1 (8)	1 (2)	0 (0)	2 (3)
Credibility *	5 (38)	0 (0)	1 (33)	6 (10)
Advantage	0 (0)	1 (2)	1 (33)	2 (3)
Outside appeal *	2 (15)	0 (0)	0 (0)	2 (3)
Other	0 (0)	4 (9)	0 (0)	4 (6)

Statistical test  $p$  value between Forest Stewardship Council (FSC) and Sustainable Green Ecosystem Council (SGEC) excluding holders of both certifications: \* =  $p < 0.05$ .

### 3.3. Reason for Choosing the Particular Certification Body

The reasons for choosing the particular certification body were classified into six groups as shown in Table 5 for each certification system. Regardless of certification scheme, the most frequent reasons were “competitiveness in estimates and bids” and “guidance and information from familiar people and enterprises”. The other main reason for choosing FSC was “achievements and credibility”. There were no significant differences between the two groups.

**Table 5.** Reasons for choosing the particular certification body.

Reason	FSC	SGEC	FSC and SGEC	Total
	( <i>n</i> = 13)	( <i>n</i> = 47)	( <i>n</i> = 3)	( <i>n</i> = 63)
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
Achievements and credibility	3 (23)	4 (9)	0 (0)	7 (11)
Publicity	1 (8)	2 (4)	0 (0)	3 (5)
Competitiveness in estimates and bids	5 (38)	11 (23)	1 (33)	17 (27)
Guidance and information from familiar people and enterprises	4 (31)	23 (49)	2 (67)	29 (46)
Advertisement, sales, and competition	1 (8)	2 (4)	0 (0)	3 (5)
Other	0 (0)	4 (9)	0 (0)	4 (6)

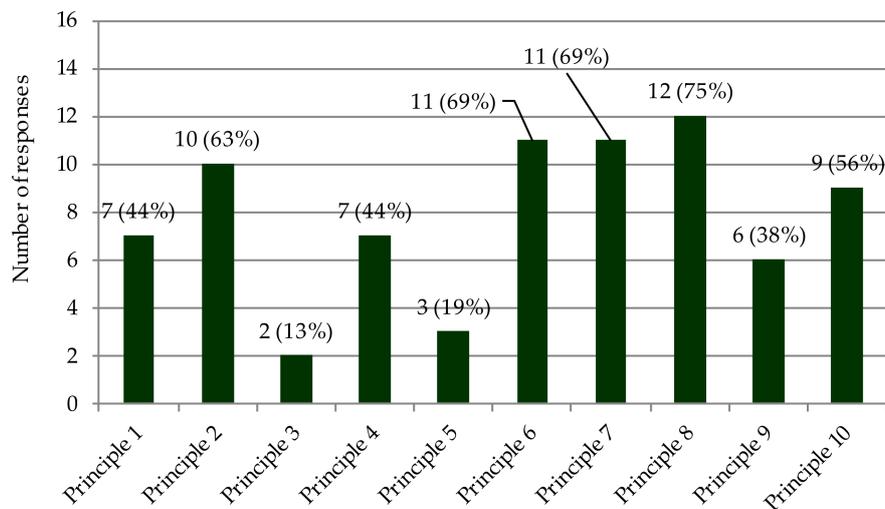
FSC: Forest Stewardship Council; SGEC: Sustainable Green Ecosystem Council.

### 3.4. Areas of Improvement Because of Certification Based on FSC Principles or SGEC Standards

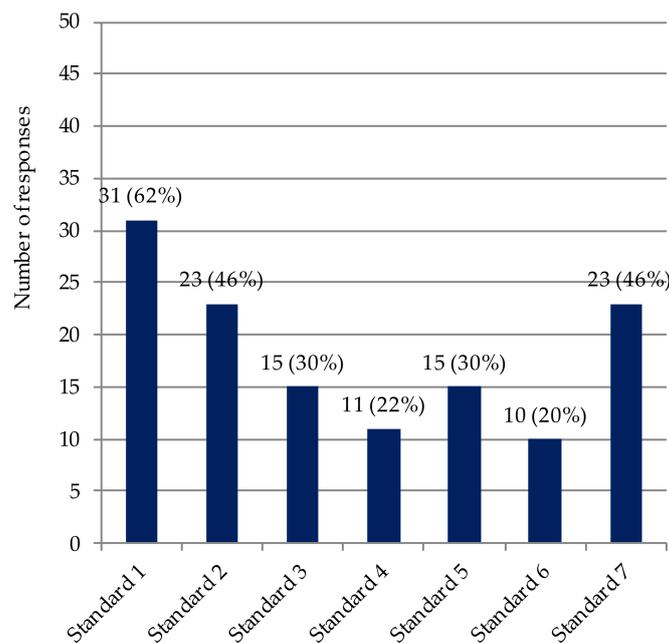
Sixteen of the forestry enterprises in the sample had FSC certification (three also had SGEC certification). Their reported improvements in the areas outlined by the FSC principles are shown in Figure 1. About 75% of the enterprises reported improvement in Principle 8 (“monitoring and assessment”), and about 70% reported improvements in Principle 6 (“environmental values and impacts”) and Principle 7 (“management plan”). About 60% of the enterprises included Principle 2 (“workers’ rights and employment conditions”) and Principle 10 (“implementation of management activities”). Only about 40% stated that Principle 1 (“compliance with laws”), Principle 4 (“community

relations”), or Principle 9 (“high conservation values”) had improved and less than 20% considered Principle 3 (“indigenous peoples’ rights”) or Principle 5 (“benefits from the forest”) to have improved.

Altogether, 50 forestry enterprises had SGEC certification (including the three who also had FSC certification) and they reported improvements in the SGEC standards (Figure 2). About 60% of the enterprises reported improvement in Standard 1 (“identification of forests and management policies”), almost one-half included Standard 2 (“conservation of biological diversity”) or Standard 7 (“monitoring and disclosure of information”), and about 30% of the enterprises listed Standard 3 (“conservation and maintenance of soil and water resources”) or Standard 5 (“legal and institutional framework for sustainable forest management”). Few respondents reported improvements on Standard 4 (“maintenance of productivity and health of forest ecosystem”) or Standard 6 (“maintenance and promotion of social and economic benefits”).



**Figure 1.** Areas of improvement because of Forest Stewardship Council (FSC) certification based on FSC principles.



**Figure 2.** Areas of improvement because of Sustainable Green Ecosystem Council (SGEC) certification based on SGEC standards.

### 3.5. Other Effects of Certification

The improvements other than those based on the FSC principles and SGEC standards were classified into 11 groups. Table 6 shows the results for each certification system. Regardless of the certification type, the most commonly reported improvements were “management improvement”, and “favorable marketing, selective purchase, and utilization promotion”. About 10% of the enterprises included “awareness improvement”, “price increase”, “spreading to the surrounding area”, and “outside appeal”. Among those with FSC certification, “spreading to the surrounding area” and “outside appeal” were most common. Those with SGEC certification mainly reported “management improvement”, “price increase”, “awareness improvement”, and “favorable marketing, selective purchase, and utilization promotion”. The three enterprises with both certifications mentioned five improvements. Statistically significant differences were found regarding “improvement of the company’s image”, “spreading to the surrounding area”, “outside appeal”, and “interactions with others” ( $p < 0.05$ ), which have asterisk in Table 6. That is, the effects on FSC certification acquisition enterprises were to strongly improve “spreading to the surrounding area”, “outside appeal”, “improvement of the company’s image”, and “interactions with others”.

**Table 6.** Areas other than FSC principles and SGEC standards that improved after certification.

Area of Improvement	FSC	SGEC	FSC and SGEC	Total
	( <i>n</i> = 13)	( <i>n</i> = 47)	( <i>n</i> = 3)	( <i>n</i> = 63)
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
Awareness improvement	1 (8)	5 (11)	0 (0)	6 (10)
Management improvement	1 (8)	8 (17)	1 (33)	10 (16)
Improvement of the company’s image *	3 (23)	1 (2)	0 (0)	4 (6)
Price increase	0 (0)	7 (15)	0 (0)	7 (11)
Spreading to the surrounding area *	4 (31)	2 (4)	1 (33)	7 (11)
Traceability	1 (8)	1 (2)	0 (0)	2 (3)
Outside appeal *	4 (31)	2 (4)	1 (33)	7 (11)
Favorable marketing, selective purchase, and utilization promotion	2 (15)	5 (11)	1 (33)	8 (13)
Carbon offset	1 (8)	0 (0)	0 (0)	1 (2)
Interactions with others *	2 (15)	0 (0)	0 (0)	2 (3)
Other	0 (0)	2 (4)	1 (33)	3 (5)

Statistical test  $p$  value between Forest Stewardship Council (FSC) and Sustainable Green Ecosystem Council (SGEC) excluding holders of both certifications: \* =  $p < 0.05$ .

### 3.6. Areas of Dissatisfaction with Certification

Responses indicating dissatisfaction with certification were categorized into 14 groups. The results are shown in Table 7 for each certification system. Regardless of the type of certification, the most frequent area of dissatisfaction was “timber value and no added value”. Other areas of dissatisfaction were “low recognition”, “no favorable marketing and no demand”, and “high assessment costs”. The main area of dissatisfaction among enterprises with FSC certification were “low recognition”, “high assessment costs”, and “other”. The main areas of dissatisfaction among those with SGEC certification were “timber value and no added value”, low recognition”, and “high assessment costs”. Those with both certifications were mainly dissatisfied with “timber value and no added value”. There were no significant differences between the two groups.

### 3.7. Certification Costs

The costs of certification are shown in Table 8. The costs of certification reported by many of the forestry enterprises were JPY 1–3 million regardless of the certification type. The certification costs were higher for FSC than for SGEC certification. Some FSC- and SGEC-certified forestry enterprises spent JPY 9 million or more on certification.

**Table 7.** Dissatisfaction with certification.

Area of Dissatisfaction	FSC	SGEC	FSC and SGEC	Total
	(n = 13)	(n = 47)	(n = 3)	(n = 63)
	n (%)	n (%)	n (%)	n (%)
Domestic only	0 (0)	2 (4)	0 (0)	2 (3)
No favorable marketing and no demand	2 (15)	7 (15)	0 (0)	9 (14)
No differentiation	0 (0)	3 (6)	0 (0)	3 (5)
No favorable treatment	2 (15)	1 (2)	0 (0)	3 (5)
Low recognition	4 (31)	7 (15)	0 (0)	11 (17)
No appeal to the outside	0 (0)	1 (2)	0 (0)	1 (2)
Timber value and no added value	2 (15)	13 (28)	2 (67)	17 (27)
High assessment costs	3 (23)	8 (17)	0 (0)	11 (17)
Cumbersome documents	1 (8)	1 (2)	0 (0)	2 (3)
Cooperation with the surrounding area	1 (8)	4 (9)	0 (0)	5 (8)
No effects	0 (0)	5 (11)	0 (0)	5 (8)
Major effort involved	2 (15)	1 (2)	1 (33)	4 (6)
A sense of mistrust	0 (0)	3 (6)	0 (0)	3 (5)
Other	3 (23)	2 (4)	0 (0)	5 (8)

FSC: Forest Stewardship Council; SGEC: Sustainable Green Ecosystem Council.

**Table 8.** Forestry enterprises' certification acquisition costs.

Certification Cost (JPY Millions)	FSC	SGEC	FSC and SGEC	Total
	(n = 13)	(n = 47)	(n = 3)	(n = 63)
	n (%)	n (%)	n (%)	n (%)
<1	1 (8)	8 (17)	0 (0)	9 (14)
1–<3	7 (54)	29 (62)	3 (100)	39 (62)
3–<5	3 (23)	5 (11)	0 (0)	8 (13)
5–<7	0 (0)	1 (2)	0 (0)	1 (2)
7–<9	1 (8)	0 (0)	0 (0)	1 (2)
>9	1 (8)	1 (2)	0 (0)	2 (3)
Missing	0 (0)	3 (6)	0 (0)	3 (5)

FSC: Forest Stewardship Council; SGEC: Sustainable Green Ecosystem Council.

### 3.8. Economic Effects of Certification

The economic effects of certification are shown in Table 9 by certification system. Overall, about 20% of the respondents reported a general positive economic effect, about 40% reported no economic effect, and about 40% answered “undetermined”. There were no significant differences between the two groups.

**Table 9.** Economic effect of certification

Economic Effect	FSC	SGEC	FSC and SGEC	Total
	(n = 13)	(n = 47)	(n = 3)	(n = 63)
	n (%)	n (%)	n (%)	n (%)
Positive effect	3 (23)	10 (21)	0 (0)	13 (21)
No effect	5 (38)	19 (40)	2 (67)	26 (41)
Undetermined	5 (38)	18 (38)	1 (33)	24 (38)

FSC: Forest Stewardship Council; SGEC: Sustainable Green Ecosystem Council.

### 3.9. Certification Update

The respondents' intentions of updating their certifications are shown in Table 10. About 77% of the forestry enterprises with FSC certifications planned on "renewal". Fifteen percent reported that an update was being considered. However, about 45% of the enterprises with SGEC certification planned on renewal, 45% reported that renewal was "under consideration", and 11% were not planning to update their certifications, clearly showing that those with FSC certifications were more likely than those with SGEC certifications to plan to update their certifications ( $p < 0.05$ ).

**Table 10.** Intention to renew certification.

Intention to Renew	FSC ( <i>n</i> = 13)	SGEC ( <i>n</i> = 47)	FSC and SGEC ( <i>n</i> = 3)	Total ( <i>n</i> = 63)
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
Renew *	10 (77)	21 (45)	2 (67)	33 (52)
Not renew	0 (0)	5 (11)	0 (0)	5 (8)
Under consideration	2 (15)	21 (45)	1 (33)	24 (38)
Missing	1(8)	0 (0)	0 (0)	1 (2)

Statistical test  $p$  value between Forest Stewardship Council (FSC) and Sustainable Green Ecosystem Council (SGEC) excluding holders of both certifications: \* =  $p < 0.05$ .

## 4. Discussion

This study's results indicated that forest enterprises in Japan chose FSC or SGEC certification for various reasons. The reasons for obtaining FSC certification were mostly to achieve sustainable forest management by third-party certification, appeal to the outside, brand the products, and increase profits. The results were similar for enterprises with SGEC certifications, suggesting broad similarities regarding the enterprises' objectives.

However, there was a difference in the reasons for choosing between FSC and SGEC. Those with FSC certification emphasized the reliability of the international certification system. On the other hand, the enterprises with SGEC certification focused on Japan, and they were interested in the examination costs and difficulty of acquisition, connection to peripheral areas, and guidance and information from familiar people and enterprises. Therefore, the choice of FSC or SGEC depended on the international or domestic focus of the enterprise, reliability, examination costs, and difficulty of acquisition. Because the selection of the FSC or the SGEC was important to estimation, bidding, and guidance and information from familiar people and enterprises, cost was an important aspect of certification.

The respondents reported improvements in management planning, environmental impact assessments, and monitoring. These improved items are also shown in CAR's analysis by Sugiura et al. [8–10]. Therefore, certification was effective for "sustainable forest management", which was a reported reason for certification. The enterprises with FSC certification were influenced by the certification, improvement of company image, spreading to surrounding areas, outside appeal, and interaction with other companies, suggesting that a part of the reason for obtaining certification was achieved.

The certification cost reported by many of the respondents was JPY 1–3 million, which was probably a heavy burden for them to bear. Moreover, an additional cost is imposed during annual audits. The most common complaint was that certification did not add value (increase profit). Another complaint was that the certification cost was high, whereas recognition of forest certification was low. The enterprises with FSC certification also complained about the major effort involved in obtaining certification. Therefore, many of the forestry enterprises that expected to increase profits did not receive any economic benefit, despite a heavy outlay of cost and effort for their certifications. Thus, it seems that the enterprises with both forms of certification were few because there was no merit with both forms of certification.

However, some enterprises with SGEC certification saw increases in income in this study and some of the forestry enterprises reported positive economic effects. For example, demand for timber from the Yusuhara forest owners' cooperative with FSC certification in Kochi Prefecture has reportedly increased [24]. Enterprises that have not realized economic benefits should examine the successful forestry enterprises.

Most of the enterprises with FSC certification indicated their intentions to continue certification through renewal and update, but almost one-half of the enterprises with SGEC certification were less convinced and were only "considering" updates. In fact, some of them stated their intention of not continuing. Thus, many of the enterprises with FSC certification seem to have a strong desire to realize sustainable forest management, whereas some of the enterprises with SGEC certification may have prioritized their profit margins. According to Gubbage et al., many enterprises have experienced changes in forest management, environmental protection, community relations, public affairs, finances, and environmental management [25]. Moreover, these firms were generally pleased with certification, and they intended to recertify, although the lack of price premiums was their greatest disappointment [25]. Therefore, many enterprises are expected to continue with certification.

Market principles should not be ignored when predicting the future of the certification system, and it is necessary to consider the economics involved. Many forestry enterprises could expect to be able to obtain SGEC certification for international certification at a relatively low cost. According to Owari and Sawanobori, in contrast to the initial idea, forest certification might encourage suppliers, as opposed to consumers, of wood products to bear the costs of sustainable forest management [26]. If the SGEC scheme is relatively easy and the FSC is relatively expensive, the SGEC forest area should continue to expand. It is necessary to enhance Japanese consumers' understanding of forest certification schemes and to pay close attention to the future progress of forest management certification in Japan because of the SGEC's international certification feature.

## 5. Conclusions

This study identified reasons that forestry enterprises in Japan choose FSC or SGEC certification, which are the two major certification schemes in Japan, and the effects of that certification. Although FSC and SGEC certifications apparently improved forest management, added value was not reported. The data suggested that the forest enterprises with FSC certification valued sustainable forest management relatively more than the enterprises with SGEC certification. Masters et al. pointed out that FSC audits have more conditions and recommendations than the other two standards of the Canadian Standards Association and the Sustainable Forestry Initiative and that FSC standards require more changes in the environmental, social, economic, and management systems [27]. However, since the establishment of mutual recognition between SGEC and PEFC, SGEC has become an international certification system, and the advantages of FSC certification have relatively decreased. The FSC and PEFC in Sweden, particularly from an international perspective, could be regarded as very environmentally effective [28].

Certified enterprises highlighted sustainable forest management as the primary reason why they entered into these schemes. However, this study found that the biggest obstacles to forest certification were (1) "forest-certified materials are not sufficiently evaluated", (2) "we cannot fully utilize it even if we acquire certification because the ownership of the forest is small", and (3) "certification acquisition cost and maintenance cost". Their efforts to demonstrate sustainable management are still not sufficiently recognized by society.

**Author Contributions:** K.S. conceived and designed the experiments; K.S. performed the experiments; K.S. and Y.O. analyzed the data; K.S. wrote the paper.

**Conflicts of Interest:** The authors declare no conflict of interest.

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