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Certifying Forests to Achieve Sustainability in Industrial Plantations: Opinions of Stakeholders in Spain

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Received: 17 October 2017; Accepted: 7 December 2017; Published: 13 December 2017

Abstract: Forest certification is a practice that has been consolidated worldwide in recent years as a result of certification often being associated with sustainability. However, there is not much research available on the perception of stakeholders and experts of that association. This study evaluates how key stakeholders relate certification to sustainability, and its implications for forest management. A survey was implemented in the eucalyptus plantations of Galicia, northwestern Spain, to assess how forest managers; advisors; environmental organizations; researchers; and members from the FSC (Forest Stewardship Council), PEFC (the Program for Endorsement of Forest Certification), and forest companies and associations, perceive this relationship. The opinions indicate that it should not be assumed that certified plantations are necessarily perceived as the most sustainable ones, that there is always a direct relationship between certification, nor that forest owners and managers certify their woodlands in order to guarantee sustainability. The results also showed that perceptions of certification and sustainability were not influenced by the opinions of different groups of stakeholders.

Keywords: forest certification; *Eucalyptus* plantations; stakeholders; forest sustainability

1. Introduction

Since its beginnings, forest management has included a sustainability component as this idea was initially defined as such in the forestry sphere [1]. This concept was usually related only to the fulfillment of a sustained yield [2], although the original idea of sustainability included the ideal of a normal forest. In short, sustainability has been a primary component of forest management over the last 250 years [3]. However, since the United Nations Conference on Environment and Development held in Rio de Janeiro in 1992, the sustainability idea has integrated components other than the productive ones, which fit into the concept of sustainable forest management. Following [4], production sustainability at first revolved around the sustainability of multiple uses, and now includes the sustainability of ecosystems and social values. In short, these components support a process of managing forests which is economically viable, environmentally benign, and socially beneficial; and which balances present and future needs [5]. Thus, sustainability has been addressed from several viewpoints, and there is a general agreement on the need to identify a multidisciplinary list of criteria and indicators to characterize it [6].

For many years, the idea instilled has been that forest certification is a necessary step towards tackling sustainability in forest management under an environmental, social, and economic prism [7].

When defining a forest certification pattern as an example of the voluntary sustainability practices of the enterprises that adopt it [8], it can be affirmed that forest certification could encourage sustainability in forest management [9].

There is extensive literature on forest certification and it confirms that, sometimes, certification may not be economically viable for small owners [10], that companies certifying their products do not always receive the market signals expected [11], or that forest certification reduces management options and increases the owner's costs [12]. Other authors suggest that the benefits of forest certification outweigh its drawbacks [7]. On the other hand, it should be pointed out that much of the literature has focused on analyzing the impact of certification on forest products, by using criteria like the existence (or not) of direct economic profits derived from the establishment of these certification processes [13,14]. However, other authors show how there is a lack of information regarding the certification perspectives across this value chain [15], although it seems that forest certification provides a competitive advantage for firms marketing certified products [16,17].

Due to the two certification systems most used worldwide being FSC (Forest Stewardship Council) and PEFC (the Program for Endorsement of Forest Certification), several studies have compared these schemes based on different information [8,18–20]. On the other hand, one line of research related to forest certification would be the integration of other ecosystem services, beyond wood production, into these systems. In the case of FSC, by the way, there is some literature available on it [21,22]. An expansion of these characteristics could lead to changes in the FSC system to allow a better integration of biodiversity conservation issues [23]. Thus, some criticisms received alleging that no benefits are provided by conservation issues could be mitigated [24]. Finally, other studies focus on analyzing links of these certification systems to aspects related to the sustainable development of different communities [25].

It is necessary to point out that, just as the management of industrial forest plantations initially derives from the basic principles of forest management, those of forest certification were originally intended for native forests. It was not until after their application to these forests that these principles began to be modified and adapted to industrial forest plantations [26]. In other words, it should be borne in mind that neither sustainable forest management goals nor certification schemes have been designed with industrial forest plantations in mind, but that they have only adapted their respective principles to these forest systems. Much of the literature addresses sustainability problems applied to forest management, where different criteria and indicators are defined [27]. However, there seems to be a consensus that, in forest sustainability issues, the three sustainability pillars (economic, environmental, and social) should be included [28]. Many studies have analyzed sustainability from a set of indicators at different levels, from local to regional and national ones [5,29,30]. In the case of industrial forest plantations, these aggregate criteria and indicators are usually modified. Thus, not all the studies that have addressed these issues have included the three pillars above [31,32]. Besides, most of them have failed to respond as to whether the forest management alternative analyzed was sustainable or not, mainly in the case of industrial forest plantations [33].

In another vein, up to now we have focused on sustainability indicators, but no comment has been made on the inclusion of aspects related to forest certification. In short, the sustainability of industrial forest plantations should not be confused with the concept of forest certification. As a consequence, the sustainability indicators in these forest systems should not be the same as those used in forest certification systems. Thus, there are examples in which even the certification (or not) of a plantation is considered as an indicator of sustainability [34], or where there are non-certified sustainable forest plantations [33]. In other studies, FSC certified plantations are compared with different sets of indicators (mainly environmental and social ones) in order to evaluate their effectiveness [35]. This study is one of the few examples in which the impact of certification on the sustainable forest management of industrial forest plantations has been proven on the ground. This assessment was unknown in the literature [36,37].

Another exception of studies analyzing the relationships between certification and sustainability and their implications for forest management is shown in [38], in which it is concluded that a certain compatibility exists between FSC principles and sustainable forest management. Also, some works analyze the links between the diverse sustainable forest management initiatives, defined in different parts of the world and belonging to different forest certification schemes [39]. In fact, there seems to be a consensus in recognizing that the criteria and indicators used in sustainable forest management initiatives (SFM) do not necessarily have to be the same ones as those employed in the certification of forest systems [40]. Finally, as was commendably mentioned by [41], certification can be considered as being a mechanism ensuring that the major paper and pulp producing industries exert a certain degree of sustainability in the management of forest plantations. Thus, negative perceptions of planted forests are changing due to these certification schemes [42].

All the above indicates that, in principle, the relationship between sustainability and certification is not necessarily so direct. This has been verified in [33], for whom the sustainability of 48 industrial forest plantations in Spain (mainly covered by *Eucalyptus* spp.) has been analyzed by means of 9 indicators and 3 sustainability criteria. A ranking of the 48 plantations was set up in terms of sustainability, and it was concluded that the certification of those plantations, using FSC or PEFC systems, was not statistically significant with the ranking obtained. This leads us to think that different indicator systems are being compared and that they are not intended for the same objectives. That is to say, sets of sustainability indicators can be designed that are different to those proposed by the certification systems most widely used, and this could lead to disparities in the links between certification and sustainability. In short, we should not conclude that certified plantations are always more sustainable.

However, an important body of recent research on forest management implicitly accepts that there is an almost perfect correspondence between a 'certified' forest and a 'sustainable' one. In short, the management of a forest is sustainable if it is certified, and vice versa. In this work, the above statement will be analyzed as a hypothesis to be empirically tested. On the other hand, on many occasions, the links between certification and sustainability have been established without taking into account the opinion of different stakeholders. However, the role played by different social groups and stakeholders is vital to the characterization of the degree of sustainability of a forest. In short, the main aim of this study was to examine certification/sustainability relationships by concentrating on the case of industrial forest plantations. Given that the works analyzing forest certification and sustainability aspects usually focus on owners and industries, a larger number of stakeholders has been included in the analysis through a survey carried out in Galicia (Northwest of Spain).

In addition, starting from the basis that forest certification is a practice that has been consolidated in the last few years worldwide, a set of hypotheses has been formulated on the relationship between sustainability and certification. First, it was initially assumed that there is a direct relationship between certified forest systems and sustainability since one of the main goals of forest certification scheme was to reduce illegal deforestation and biodiversity loss [43,44]. Since the emergence of forest certification schemes, there have been expectations that forest certification could support the delivery of forest ecosystem services such as carbon storage, soil and watershed protection, biodiversity conservation, and ecotourism [21,40,45]. Furthermore, forest owners certify their plantations in order to guarantee their sustainability, and bear the necessary costs, although actually they are not obliged to certify them. Potentially high costs of getting a forest certified have been considered as being a key barrier to its adoption, along with markets that are not large enough and the complexity associated with the delivery of forest ecosystem services and management actions [22,46]. Despite the certification costs eucalyptus plantations in Galicia are still certified and the fact that certification could guarantee their sustainability may be an important driver of its adoption. It has also been assumed that FSC is would be seen as being the certification system in Europe that best guarantees sustainability and that it is therefore the one most preferred in the eucalyptus plantations of Galicia. In fact, [47] have suggested that FSC is the most credible certification system worldwide. Whilst [8] agreed with this hypothesis in a comparison between the 60 biggest companies, [48] stated that FSC criteria for sustainable forestry

differed positively from their competitors. The last hypothesis assumed that the stakeholder group membership determined the answer in relation to forest certification and sustainability. Past research has shown that stakeholder perceptions and opinions can differ depending on different interests and needs [21,49].

2. Materials and Methods

Eucalyptus spp. plantations (mainly *Eucalyptus globulus* Labill.) in Galicia (see the geographical location in Figure 1) are some of the most productive and profitable timber production systems in Europe. The first plantation with this species in Spain dates from around 1850 [50]. Nowadays, more than 0.6 million ha of land are covered with *Eucalyptus* spp. in Spain, and the volume of *Eucalyptus globulus* harvested annually is about 6 million m^3 [51]. Although, in the best sites, timber yield may reach up to 50 m^3 per ha and year, these plantations in Galicia are usually very fragmented and industrial plantations are scarce [52]. The stands are managed on the simple coppice system, without any environmental constraints. In short, even-aged stands developed from planted seedlings are clear cut at the end of the first rotation, and repeated crops (frequently two or three) secured from stump-sprouts are coppiced on succeeding rotations [53]. This species in Spain is commonly managed in rotations of 12–18 years.

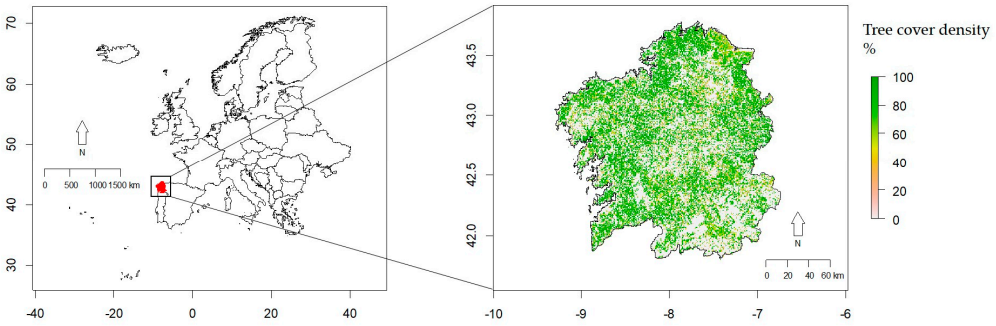

Figure 1. Location and tree cover density of Galicia, Spain.

We have carried out a survey among different stakeholders involved in plantations management in Galicia. The questionnaires, with 27 questions, were sent by e-mail in one round using commercial software (Survey Monkey Advanced Plan, San Mateo, CA, United States). For privacy reasons, the survey maintained respondents' anonymity. However, we incorporated a question asking the respondent in which stakeholder group he/she could be included. The first section of questions concerned issues related to different criteria and indicators defined for these forest systems [33] with a "pairwise" comparison format using Saaty's verbal scale [54,55]. The last part of the survey was focused on the hypothetical relations between sustainability and certification, and provides the data used in this paper. Some of these questions are shown in the next Section.

In brief, we contacted 64 stakeholders belonging to different stakeholder groups, and asked them to which group they belonged (a participant in the survey could fit into more than one stakeholder groups). Initially, we considered having diverse groups. Most plantations are owned in small, scattered holdings. Despite their high productivity and the importance of eucalyptus plantations to the local wood industry, the management of these plantations is far from optimal. So, the first group included forest managers (from the Regional Forest Service and industrial companies), and private forestry consultants. Another group was formed by environmental organizations, due to the ecological impacts reported when these plantations are managed under intensive forestry practices. In another group, we included people from diverse associations (non-industrial private forest associations and others) and from the wood industry. As forestland in Galicia is mainly owned by non-industrial forest owners, they were incorporated into another group, either as individuals or communities. Another stakeholder group was composed of researchers, including some university lecturers on forestry. Although there

are many plantations without certification systems, it was considered as appropriate to include in this survey members of the two main forest certification organizations (FSC and PEFC). They were integrated into another group. The last two groups included the mayors and councilors from the municipalities to which the plantations are vital, and people from different companies and industrial associations. Finally, in Table 1 we have included a description of the stakeholders groups included in this study.

Table 1. Stakeholders and stakeholders groups considered in this study

Stakeholder Type	Description	Asked Stakeholders	Answered Stakeholders	Group	*n*
Forest managers and experts	Forest managers and engineers (from public administration and industrial companies), and private forestry consultants	24	17	Forest managers and experts	17
Environmental organizations	Members of different environmental organizations	4	2	Other groups	10
Associations	People from the main non-industrial private forest owner associations, from associations involved in communal forestry land, and other forest associations	9	2		
N.I.P.F.O. *	Non-industrial private forest owners, either individuals or commoners	8	3		
Researchers	Researchers, including some university lecturers on forestry	5	2		
Industry	People from different companies and industry associations	5	1		
Certification	Members from forest certification organizations (FSC and PEFC)	4	0	Non-identified	14
Local authorities	Mayors, councillors, and trade unions	5	0		
Non-identified	Stakeholders that did not want to identify themselves	N/A	14		
Total		64	41		41

* N.I.P.F.O.: Non-industrial private forest owners.

The hypotheses of this study were tested by a frequency analysis, Pearson's chi-squared tests and Cramér's V measures [56,57]. In the Pearson's chi-squared tests, the null hypothesis was that the variables related to the individual's perception of forest certification and sustainability were independent of each other. The alternative hypothesis was that the individual's perceptions were in some way correlated. Thus, when *p*-values were less than 0.1, the null hypothesis that the variables were independent could be rejected and it could be said (with a 90% confidence) that there was some correlation between the two variables. Cramér's V measure was used to analyze the size of the effect (strength of the association) between the variables related to perception of forest certification and sustainability (nominal variables). Hence, Cramér's V measured the correlation between two variables in which values close to 0 indicated a low correlation and values close to 1 indicated a high one.

3. Results

3.1. Stakeholder's Perceptions of Forest Certification and Sustainability

Out of the 64 stakeholders contacted, 41 satisfactorily completed and returned the survey. In order to assess the differences between them, three main groups were identified: (i) *Forest managers and experts* (n = 17), (ii) stakeholders that did not want to identify themselves (Not identified, n = 14), and (iii) other groups (Rest, n = 10), which included people from varied associations (environmental, non-industrial private owners), researchers, and diverse owners.

As a starting point, the three categories were defined in accordance with the experience of the authors in eucalyptus plantations. As people contacted for the survey could fall into different stakeholder categories, it was decided that respondents could choose which category they felt they

belonged to. The non-identification category was established because some stakeholders were initially considered to belong to different categories. For example, one FSC member was, at the same time, a forestry consultant. An ecologist was simultaneously a forest manager in a public administration body, and so on. Due to these non-univocal cases, and to the anonymity of the survey, we decided to leave people to decide which stakeholder category they belonged to instead of assigning each stakeholder to one initially predetermined category. Unfortunately, some of these individuals did not answer this question, but this should not invalidate these questionnaires. This study does not aim to separately analyze the non-identified group of stakeholders. The latter can be a mix of various stakeholder types. However, these non-identified stakeholders did answer the questionnaire and consequently, the data can be used. This study aims to assess whether there are differences among the 'identified' stakeholder groups' from the rest of stakeholders.

Figure 2 shows the stakeholders' responses to the survey questions related to forest certification and sustainability. Overall, the results show that stakeholders did not agree with the statement that certified plantations were the most sustainable plantations. Whilst around one-third of the stakeholders did, another third of stakeholders disagreed and the rest did not agree with any of them, or did not know. This shows that there is no clear agreement on the fact that certified plantations are the most sustainable ones. Over 70 percent of stakeholders acknowledged that there might be sustainable plantations that were not certified. When asked if plantations were certified to guarantee their sustainability, most stakeholders refuted this because the plantations could have been certified for other reasons. When asked if certification was an extra cost that did not ensure sustainability, around 41 percent of stakeholders agreed and around 32 percent disagreed. The percentage of stakeholders disagreeing with this statement was notably higher among forest managers and experts than in the other stakeholder groups.

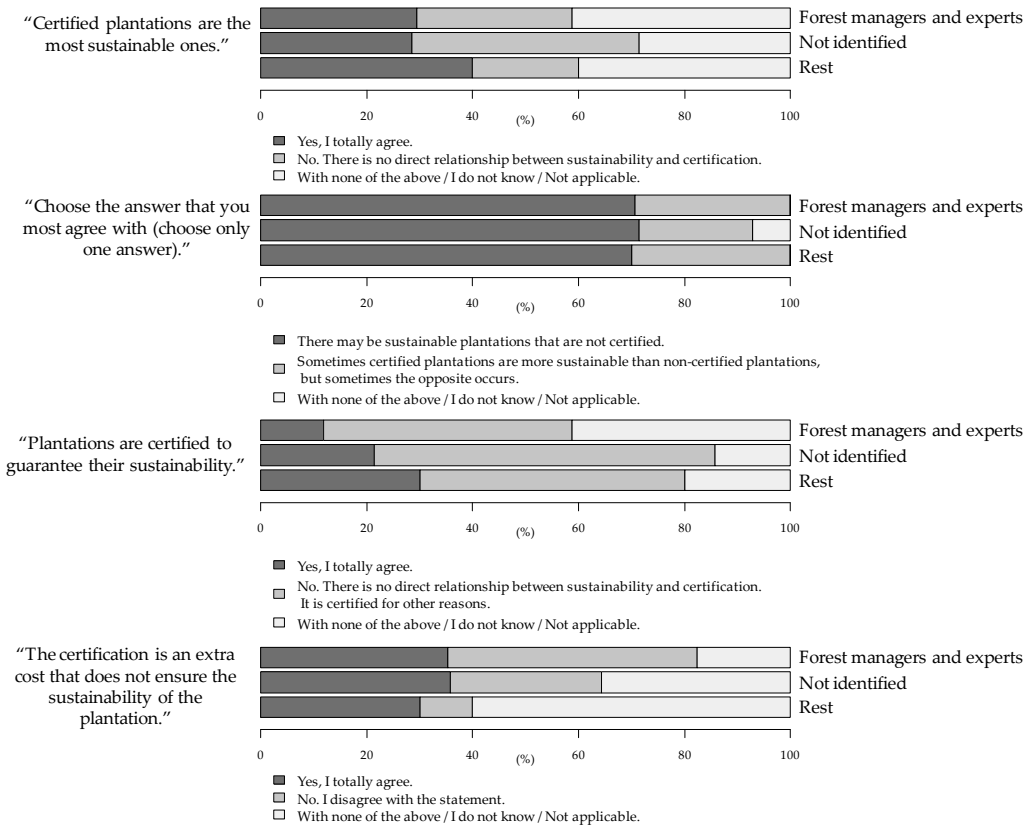

Figure 2. Stakeholders' perceptions of forest certification and sustainability (n = 41). Stakeholders were classified in three groups: *Forest managers and experts* (n = 17), stakeholders that did not want to identify themselves (Not identified, n = 14) and other groups (Rest, n = 10).

Around 49 percent of stakeholders selected FSC as the forest certification system most preferred, followed by PEFC which was selected by around 20 percent of stakeholders (Figure 3). Approximately 24 percent of stakeholders selected the option of either FSC or PEFC. The fact that FSC was the certification system most esteemed was accentuated among forest managers and experts. When asked about the future of certification in eucalyptus plantations in Galicia, most stakeholders indicated that it would significantly increase in the future. Among the stakeholders, 76.2 percent indicated that certification in eucalyptus plantations would significantly increase, 16.7 percent indicated that it would grow very slightly or be maintained, and only 2.4 percent indicated that it would decrease. It is worth highlighting that the different groups of stakeholders answered the questions in a similar way.

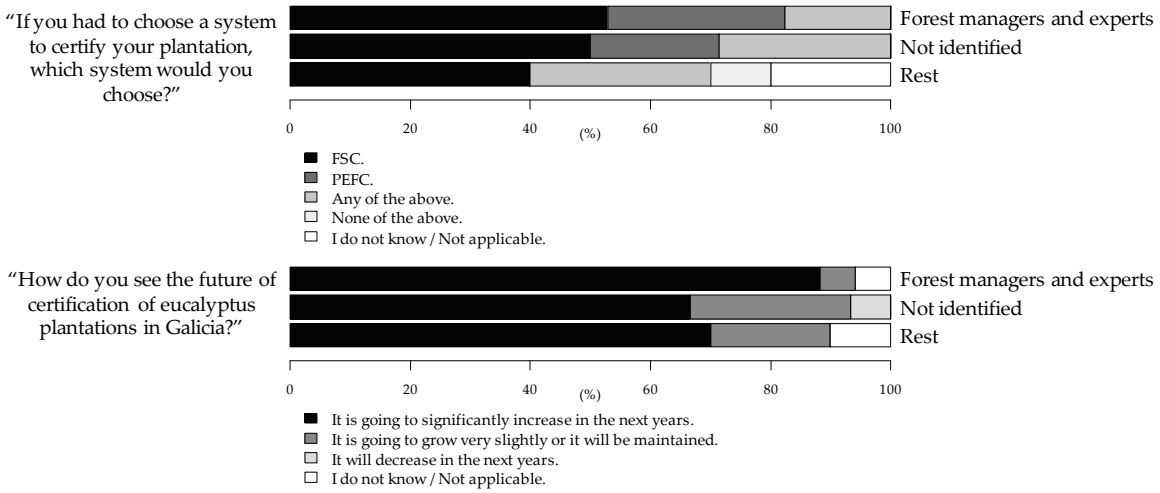

Figure 3. Stakeholder's preference for forest certification system and its future (n = 41). Stakeholders were classified in three groups: *Forest managers and experts* (n = 17), stakeholders that did not want to identify themselves (Not identified, n = 14) and other groups (Rest, n = 10).

3.2. Relationship between Forest Certification and Sustainability

The frequency analysis described in Figures 2 and 3, Pearson's chi-squared tests and Cramér's V measures were used to test the aforementioned hypotheses (see last paragraph in the Introduction section). Table 2 shows the results of the Pearson's chi-squared tests and Cramér's V of the relationship between the perceptions of forest certification and sustainability.

Table 2. Relationship between perceptions of forest certification and sustainability. Figures indicate p-values of Pearson's chi-squared tests. Figures in brackets indicate Cramér's V values.

Items	"Choose the answer that you most agree with (choose only one answer)"	"Plantations are certified to guarantee their sustainability"	"The certification is an extra cost that does not ensure the sustainability of the plantation"
"Certified plantations are the most sustainable ones"	0.151 (0.287)	0.006 *** (0.419)	0.001 *** (0.468)
"Choose the answer that you most agree with (choose only one answer)"		0.005 *** (0.423)	0.311 (0.241)
"Plantations are certified to guarantee their sustainability"			0.411 (0.220)

*** $p < 0.01$.

The first research hypothesis of this study presumed that there was a direct relationship between certified forestry systems and sustainability. The survey results seem to indicate that this hypothesis was not totally true or that it was true with some nuances. First, the frequency analysis in Figure 2 shows that 32 percent of stakeholders agreed with the statement that certified plantations were the most sustainable systems. This suggested that certified systems were perceived as being "more" sustainable systems, which indicated a clear positive relationship. On the other hand, when asked if plantations were certified to guarantee sustainability, only 20 percent agreed and 54 percent disagreed ("No. There is no direct relationship between sustainability and certification. It is certified because of other reasons"). This finding seemed to show that whilst most stakeholders perceived that certified plantations were to some extent sustainable, many of them felt that certification was not a necessary condition for a forest to be sustainable. This explains why 71 percent of stakeholders believed that there might be sustainable plantations that were not certified.

Moreover, the relationship between the answer to the statement "Certified plantations are the most sustainable ones" and "Plantations are certified to guarantee their sustainability" was found to be statistically significant since the null hypothesis of the Pearson's chi-squared test was rejected (Cramér's V = 0.419). Similarly, there was also a significant relationship between the answer to the statement "Plantations are certified to guarantee their sustainability" and the statements where respondents had to choose between "There may be sustainable plantations that are not certified" and "Sometimes certified plantations are more sustainable than non-certified plantations" (Cramér's V = 0.423). These results were on par with the first hypothesis that assumed a direct relationship between certified forestry systems and sustainability since most stakeholders agreeing with one statement agreed with the other one, and vice versa. On the other hand, there was a significant relationship between "Certified plantations are the most sustainable ones" and "The certification is an extra cost that does not ensure the sustainability of the plantation" (Cramér's V = 0.468). In this case, the relationship turned out to be significant due to most stakeholders agreeing with one statement and disagreeing with the other one, and vice versa. For this reason, this result was also in line with the first hypothesis. There was no significant relationship between "Plantations are certified to guarantee their sustainability" and "The certification is an extra cost that does not ensure the sustainability of the plantation". This suggested a very weak association between these two statements.

In conclusion, the frequency analysis results suggested that there was a positive relationship between certified forestry systems and sustainability. However, the results indicated that this relationship was not very strong. This was explained by the fact that whilst stakeholders perceived that certified plantations were sustainable, they saw that non-certified plantations could be equally sustainable. Thus, even if a certain plantation was not certified, this did not mean that the plantation was unsustainable. In fact, the plantation could be even more sustainable than a certified one.

The second hypothesis was that, despite not being mandatory, forest owners often certify their plantations to guarantee their sustainability regardless of its economic costs. The results seemed to indicate that this hypothesis cannot be accepted as less than 20 percent of stakeholders agreed with the statement "Plantations are certified to guarantee their sustainability". In the case of forest managers and experts, less than 12 percent agreed with it.

The third hypothesis assumed that FSC would be seen as the certification system best guaranteeing the sustainability of forests in Galicia and hence would be the one most favored. The survey results showed that this hypothesis could be accepted, as FSC seemed to be the certification system most preferred in Galicia. Whilst around 20 percent of stakeholders selected the PEFC system, around 49 percent of stakeholders selected FSC, and around 24 percent selected the option of either FSC or PEFC.

3.3. Differences among Stakeholder Groups

The last hypothesis of this paper assumed that stakeholder group membership would determine the answer in relation to forest certification and sustainability. This hypothesis could be accepted if stakeholders' answers varied according to the stakeholder groups identified. Figures 2 and 3 show

the stakeholders' answers split into stakeholder groups. The graphs show that the answers did not substantially vary according to the stakeholder groups, which suggested that this hypothesis could not be accepted. This finding was confirmed by the use of Pearson's chi-squared tests. In the tests, the null hypothesis was that the variable "stakeholder group" was independent of the individual's perception of forest certification and sustainability. Hence, the alternative hypothesis was that stakeholder groups were correlated in some way with individual perceptions. The size of the effect of the variable "stakeholder group" on perceptions of forest certification and sustainability was analyzed by Cramér's V.

Table 3 shows the results of the Pearson's chi-squared tests and Cramér's V. The results showed that the null hypothesis of the stakeholder group being independent of individual perceptions could not be rejected in any of the studied variables. Thus, the tests indicated that stakeholder groups did not seem to have any statistically significant effect. This explains the low Cramér's V values in all the variables. Thus, as there was no significant effect of the stakeholder group variable on any of those studied, the hypothesis that stakeholder group membership would determine the answer in relation to forest certification and sustainability was rejected.

Table 3. Difference in perceptions of forest certification and sustainability among stakeholder groups. Pearson's chi-squared test was reported to assess statistical differences and Cramér's V to assess the effect of stakeholder groups on perceptions.

Item	Pearson's Chi-Squared Test (*p*-Value)	Cramér'sV
"Certified plantations are the most sustainable ones."	0.796	0.143
"Choose the answer that you most agree with (choose only one answer)."	0.706	0.162
"Plantations are certified to guarantee their sustainability."	0.424	0.217
"The certification is an extra cost that does not ensure the sustainability of the plantation."	0.186	0.275
"If you had to choose a system to certify your plantation, which system would you choose?"	0.115	0.397

4. Discussion

The results of this study are, to some extent, exploratory because of the small number of respondents, although we consider them as being significant because local consultants, people from NGOs and influence organizations, and researchers with expertise in the management of these plantations in the region were included in the survey. However, the result obtained in this work on the doubts appearing of the existence of a direct relationship between certification and sustainability are not on the lines of those presented in other works [1], and they would be closer to the ideas postulated in [38].

This study hypothesized that there was a direct relationship between certified forestry systems and sustainability. The results suggest that this could not be fully accepted. First, the results of the survey show that, overall, stakeholders acknowledged a certain relationship between forest certification and sustainability. However, the majority of stakeholders indicated that there are equally sustainable non-certified eucalyptus plantations. Thus, it could be argued that forest certification was not seen as a necessary condition for sustainability but as a label that could guarantee that a certain plantation is sustainable.

This study also hypothesized that forest owners often certified their plantations to guarantee their sustainability regardless of its economic costs. According to the survey results, this was not the case in the eucalyptus plantations of Galicia as few stakeholders indicated that certification was adopted to guarantee sustainability. In fact, a significant number of stakeholders stated that in some cases there

was no relationship between sustainability and certification since plantations could have been certified for other reasons. Those reasons may be very heterogeneous, but a possible one could be that customers demand certification [58] and that orders for wood proceeding from certified forests have increased in recent years [59]. Thus, it is possible that in some certified plantations, forest managers have not changed their management at all after adopting certification. This may be because the plantation had already fulfilled certification requirements and certifying the plantation was done just to facilitate the sale of timber or to sell it at higher prices instead of certifying to improve its sustainability. Also, some stakeholders indicated that certifying the plantation involves extra costs. This can be seen as being a barrier to certifying the plantation, especially when forest owners feel that their plantations already meet the sustainability requirements of certification.

Another result of this work was that there was no clear link between certification and its economic cost. This circumstance should take into account the reality of the region in which the study case is located since some incentives have been offered by the forest industry to more or less subsidize the cost of the FSC certification. This type of incentive for certifications is extensively documented in the literature [60] and, in this case, is usually between 5–8% of the price of the timber, which is higher than what some authors consider as being acceptable for forest owners to invest in forest certification schemes in Europe [10].

It is of interest to highlight that the certification standard preferred by the stakeholders was the FSC one, when the surface certified in Galicia is significantly smaller than that with PEFC, although some industrial plantations have been certified by both systems [34]. Although the stakeholders surveyed were not asked the reason for their preference for one certification system or another, the results obtained are in accordance with some studies that, based on a meta-analysis, report that forests certified with FSC reach a more sustainable forest management than with PEFC [36]. Other studies also show how, in forest industry companies, those employing FSC are superior to those using PEFC [8]. However, as some other authors have confirmed (e.g., [40]), the number of hectares certified by one system compared to another cannot be interpreted as being an indicator of the sustainability of the management in the forest systems analyzed.

Besides the above, it would seem that the perception of the stakeholders of aspects related to certification does not depend on the group to which they belong. Other authors used a large simple size in the analysis and found that different groups can have similar opinions about certain aspects of certification, whereas others have opposing ones [25].

5. Conclusions

By means of a questionnaire sent to 64 stakeholders and after making a set of initial hypotheses, the possible existence of links between certification and sustainability in industrial plantations in Galicia (NW Spain) was analyzed. The results show that it should not be presumed that certified plantations are always the most sustainable ones, or that there is always a direct relationship between certification and sustainability in these forest systems. Nor can it be concluded that owners and managers certify their forests to guarantee their sustainability. However, it has indeed been verified that FSC was perceived as being the certification system with the best guarantee of sustainable practices in these plantations. In short, the perception of stakeholders regarding the sustainability of this kind of plantation is not fully explained by the existence of a certification label. Finally, the results obtained on the stakeholders' perception with regard to issues related to certification do not depend on the group (three groups were initially defined) to which those stakeholders belonged.

Acknowledgments: The authors deeply appreciate the patience and cooperation of all the stakeholders who answered the survey. Comments and suggestions raised by Carlos Romero from Technical University of Madrid (Spain) have greatly improved this paper's presentation and accuracy. The work of Luis Diaz-Balteiro was funded by the Ministry of Economy and Competitiveness of Spain under project AGL2015-68657-R. Comments and suggestions raised by three reviewers have greatly improved the presentation and accuracy of the paper. The authors thank Diana Badder for editing the manuscript.

Author Contributions: Luis Diaz-Balteiro coordinated the study, collected the surveys, and wrote the manuscript. Silvestre García de Jalón wrote the manuscript and performed the statistical analysis.

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

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