

Consumer preference for environmentally certified forest products in New Zealand

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Abstract

The relative importance of five different wood outdoor furniture attributes to New Zealand consumers was studied using conjoint and cluster analyses. The study used a mail survey sent out in July 2000 in which respondents were asked to rate their preferences for different combinations of product attributes. The results indicate that the most important attribute for New Zealand consumers is the source of the wood (New Zealand preferred to imported). The type of forest from which the wood is sourced (plantation preferred to natural forest), whether the wood was environmentally certified or not, and the length of the warranty (longer warranty preferred) were the next most important attributes. Price emerged as the least important attribute, however when this general result was broken down using cluster analysis, four market segments for outdoor furniture in New Zealand were identified, two of which were price sensitive. The other two market segments have environmental considerations as key attributes, either in the form of preferences for explicit environmental certification or for implicit certification in the form of a preference for plantation-sourced wood. In terms of identifying these segments, results indicate that typical demographic variables, such as income or education, do not provide an adequate basis for describing these segments. The results of this study show that despite there being no environmentally certified wood on the market in New Zealand, consumers consider environmental certification or environmental attributes to be an important component of a package of product attributes in wooden outdoor furniture.

Introduction

Environmental certification of forest management and harvesting practices is a global issue, impacting forest landowners, wood product manufacturers, distribution intermediaries and consumers. Environmental certification is a

market-based, or it works as a market incentive to improve forest management, and is a voluntary approach. Its inherent aim is to promote sustainable forest management. It is based on the assumption that consumer interest in the forestry dilemma is strong, and this interest may cause consumers to discriminate in favor of environmentally certified forest products (Upton and Bass 1996). Certification programmes assume that consumers want to be assured by a neutral third party that a forest products company is employing sound practices that will ensure a sustainable forest and other benefits from the forest, such as erosion control, biodiversity, and watershed protection. It is believed that those companies who can prove themselves environmentally responsible by being certified will benefit by differentiating their products and thus increasing their share of the marketplace.

In New Zealand, there are currently no environmentally certified wood products offered in the market. However, there are many claims by manufacturers and perceptions by consumers of the environmental friendliness of the wood products sold in New Zealand. For example, Figure 1 shows a number of pieces of product information, both advertisements and in-store literature, which include reference to the source of the wood or the sustainability of the forest from which the wood was harvested.

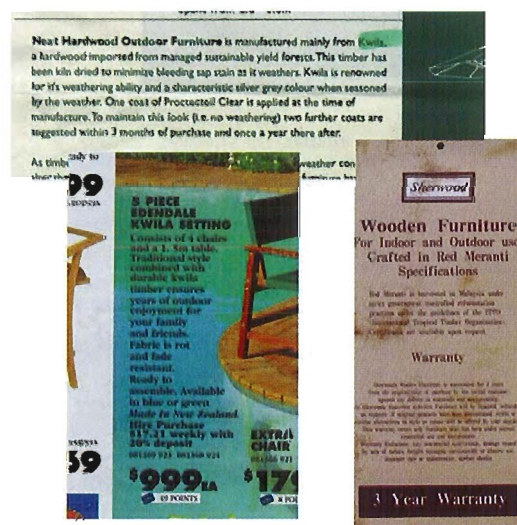


Figure 1: Product Advertisements and In-store Information

In addition, a number of companies have seen the benefits of certification and have had their operations certified under either the ISO 14000 system or the Forest Stewardship Council (FSC)

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Figure 2 Certified Product Labels

approach (McLean 1998). For instance, since Craigpine secured FSC certification, they now supply markets in Europe that were previously not accessible to them (McLean 1998).

Figure 2 provides examples of Craigpine's product label from their certified product range and the FSC-related Smartwood certification in the U.S. being undertaken by another company in New Zealand. In addition, there are currently moves to develop a New Zealand based forest product certification system (Rhodes 2001). Thus, although Western European consumers are widely held to be the most sophisticated in their demands for green and environmentally certified products, New Zealand has been active in promoting environmental aspects of its production.

As environmental certification initiatives expand, it becomes important to understand whether there are specific forestry issues that are of concern to consumers in New Zealand, and whether these concerns would influence their purchases of timber products. One example is whether consumers consider plantation-grown trees to be environmentally superior to other timbers and thus a preferred choice. Another example is consumers' perceptions of wood products from native forests, and whether environmental certification would increase preferences for these products, or whether it would influence preferences between recycled and new native timber.

There has been some previous research examining New Zealand consumers' attitudes towards environmental certification. This research has shown that New Zealand consumers are generally predisposed to environmentally friendly and certified products, would be most trusting of environmental groups as certifiers, and would pay a premium for environmentally certified wood products (Ozanne *et al* 1999). However, what has not yet been determined is the relative importance of environmental certification compared to other important wood product attributes such as price, quality level,

whether the wood is sourced from New Zealand, or whether the wood is from plantation forests. The objective of this research is to determine the relative importance to New Zealand consumers of environmental certification as compared to other important wood product attributes.

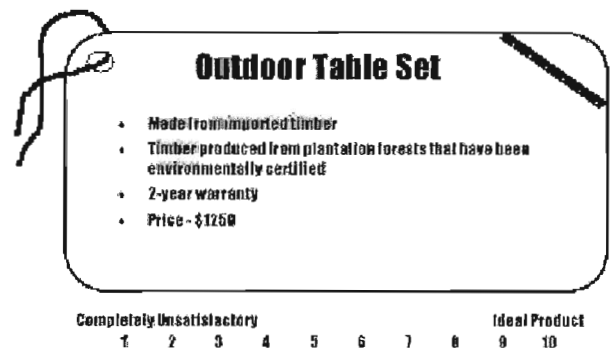
Methodology

The study uses conjoint analysis (CJA), a method that allows the relative importance of product attributes to be considered 'conjointly', or simultaneously by respondents (Green and Srinivasan. 1990, Green and Vithala 1971). In addition, CJA can determine the contribution of each individual product attribute to a respondent's overall preference for a particular 'bundle' of attributes.

The conjoint procedure was conducted using a mail survey in which respondents were asked to consider the purchase of a wooden outdoor table and four chairs. Wooden outdoor furniture was selected because it was believed that most consumers would have shopped for furniture at some point in the past, and outdoor furniture was appropriate because data were collected before the summer months. Respondents were provided with a drawing of the furniture, along with 12 different product labels (Figure 3). A standardized orthogonal design was used to construct the 12 different product labelling conditions (Green and Vithala 1971). Respondents were asked to treat the 12 labels as if they were the labels they would find attached to the furniture in a shop. Respondents were asked to rate each of the 12 labels on the information provided by circling the most appropriate number, where one equals a completely unsatisfactory product and ten equals an ideal product.

Each label contained a combination of five product attributes, with two levels or values for each attribute (Table 1). Price and warranty were selected as attributes because in a review of retailer advertisements and point of purchase information relating to outdoor furniture, these

Figure 3 Product Label



were consistently discussed. Timber source, forest type and environmental certification were selected because they are attributes that may be of particular relevance to New Zealand consumers and product manufacturers. These attributes were also commonly found in furniture product merchandising materials.

Table 1: Product Attributes and Levels

Attributes	Level 1	Level 2
Price	\$1000	\$1250
Warranty	2-year	5-year
Timber Source	Imported	New Zealand
Forest Type	Natural	Plantation
Certification	No Certification	Certification

Respondents were asked to read all the labels before starting to rate them. They were also advised that they could assign the same rating to more than one label. To help clarify the labels, respondents were given definitions for natural forests, plantation forests, and environmental certification.

Other parts of the survey contained questions to help determine the relevance of the conjoint purchase scenario, including recent purchases of furniture and experience with products displaying environmental information or environmentally certification, and demographic and socio-economic questions. The research instrument was pretested to check for biased, misleading or confusing questions, to verify the quality and comprehensiveness of information received, and to test the effectiveness of the conjoint procedure.

Survey development and implementation for this study was based on methods recommend by Dillman (1978) and described as the Total Design Method. Data were collected in July and August of 2000. In adherence to the TDM survey guidelines, an initial survey mailing, post-survey reminder and a second mailing were conducted in order to maximize response rates.

A mailing list for consumers was generated by randomly selecting names from the 1999 New Zealand Electoral Roll. Selecting the sample from the Electoral Roll ensured that respondents would be over the age of 18 and thus more likely to be in the potential target market for outdoor furniture. A total of 500 surveys were mailed. After adjusting the sample size for non-deliverable surveys and incomplete or otherwise unusable surveys, the adjusted response rate was 166 or 35 percent.

Non-response bias is often a common concern in survey research. Bias due to non-response

can be evaluated by comparing those who respond to the initial mailing to those who respond as a result of subsequent mailings and other follow-up efforts (Armstrong and Overton 1977). From this procedure, non-response bias was found to be insignificant ($\alpha = 0.05$).

Results

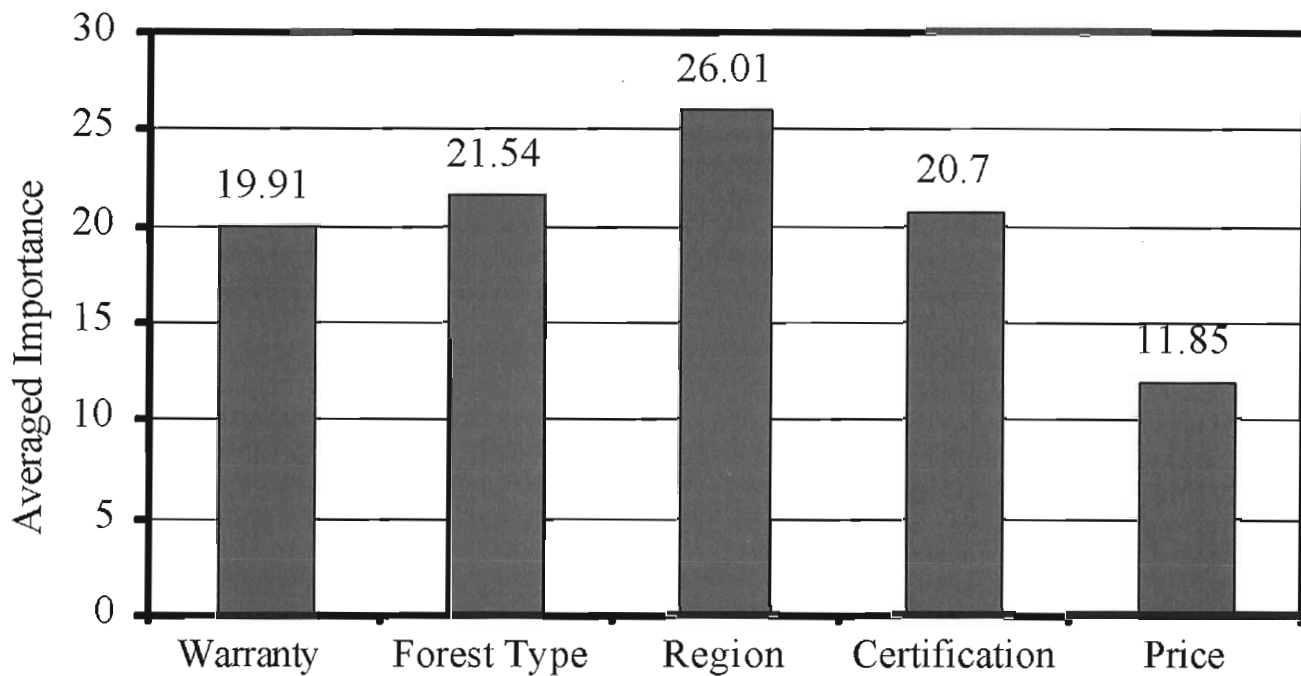
The averaged importance values of the various furniture attributes provided by the conjoint analysis are shown in Figure 4. Overall, region where the wood is sourced is rated as the most important furniture attribute (importance score of 26.01). Forest type (21.54), certification (20.70), and warranty (19.91) are rated as the next most important furniture attributes. Price (11.85) is rated as the least important furniture attribute. Pearson's R and Kendall's tau are used to indicate how well the model fits the data. Pearson's R was found to be .99, .000 and Kendall's tau was found to be .89, .000, indicating that there is a strong positive correlation or association between the observed and the estimated utility values.

Although useful, the aggregate results provided by the conjoint analysis do not provide all the potential information about furniture purchasing decisions available from the survey. CJA used in conjunction with cluster analysis can tell us whether all respondents value the product attributes in a similar fashion. Unlike other statistical methods, cluster analysis does not provide precise rules for choosing a cluster solution (Dess and Davis 1984). Hair et al. (1992) suggests that it is probably best to compute solutions for several different numbers of clusters and then to decide among the alternative solutions based upon a priori criteria, practical judgment, common sense, or theoretical foundations. In this study, utility values were clustered or classified using the Q-cluster analysis technique (Norusis 1994). A 4-cluster solution was chosen because this number of clusters was the smallest that adequately differentiated the utility values. A Scheffe one-way analysis of variance technique was used to test the hypothesis of no difference between the utility values across the four clusters. All of the attributes proved to be statistically different ($\alpha = .05$) across the four clusters.

Table 2 provides the results for the four-cluster solution from the cluster analysis procedure. Included are the relative utility values for each of the four clusters on each attribute, the most valued level of that attribute and the sample size for each cluster. The relative utility value of an attribute is computed by taking the attribute utility value divided by the sum of the utility values for all the attributes.

Cluster 1, comprising 42.2 percent of the

Figure 4: Importance of Outdoor Wooden Furniture Attributes



sample, rates certification as the most important furniture attribute, preferring environmentally certified over uncertified outdoor furniture. This cluster is also sensitive to the product warranty provided, preferring the 5-year warranty, and it is the least price-sensitive of all the clusters. Given these characteristics, this cluster represents what might be called a “quality environmentalist”.

Cluster 2, comprising 29.5 percent of the sample, rates the region where the wood was sourced as the most important furniture attribute, preferring wood sourced from New Zealand over

imported wood. The next most important attribute for this cluster was price. Given these attributes, this cluster represents what might be called the “buy-local consumer”.

Cluster 3, comprising 12.0 percent of the sample, rates price as the most important furniture attribute, preferring the lower price of \$1000. This cluster also rates a long warranty as an important furniture attribute. This cluster placed the lowest importance on environmental certification and rated this attribute the lowest of all the clusters. Given these characteristics,

Table 2: Relative Utility Values for the 4 Clusters

Attribute	Cluster 1 n=70	Cluster 2 n=49	Cluster 3 n=20	Cluster 4 n=27
Warranty	25.9%	9.0%	33.7% 5 Year	4.8%
Forest Type	12.8%	2.4%	10.1%	66.2% Plantation
Region	17.2%	66.7% NZ	5.7%	3.2%
Environmental Certification	42.3% Certified	8.7%	3.5%	18.0%
Price	1.8%	13.2%	47.0% \$1000	7.8%

this cluster represents what might be called the "value-for-money consumer".

Cluster 4, comprising 16.3 percent of the sample, rates forest type as the most important furniture attribute, preferring the wood in their outdoor furniture to come from a plantation forest. This cluster also rated environmental certification as the next most important attribute. Given these characteristics, this cluster represents what might be called the "implicit-certification consumer".

Demographic information collected in the questionnaire can be used to develop a profile of an average individual in each of the clusters. To do this, the clusters were compared on the basis of a range of demographic variables, including age group, gender, education level, environmental group membership, income, and area of residence, using a Scheffe one-way analysis of variance. It was not possible, however, to draw an adequate profile of these segments using the demographic variables that were collected in the questionnaire.

Conclusions

The objective of this paper was to determine the relative importance of environmental certification when compared to other furniture attributes that a consumer considers. For wooden outdoor furniture in New Zealand, the results of a conjoint analysis indicate that there are several important attributes. Overall, respondents are most interested in whether the wood in the furniture comes from New Zealand or is imported. Other important attributes which were somewhat similar in importance are whether the wood is plantation grown or from a natural forest, whether the wood has been environmentally certified, and the length of the warranty. Price was the least important furniture attribute.

Cluster analysis indicate that there are at least four market segments for wooden outdoor furniture in New Zealand. These segments can be characterised as the "quality environmentalist", the "buy-local consumer", the "value-for-money consumer", and the "implicit-certification consumer". About 58 percent of the sample, the quality environmentalists and the implicit-certification consumers, place a high value on the environmental attributes of their furniture, either in the form of explicit certification of the wood or in the form of implicit certification through a plantation source. Neither

of these two segments are very price sensitive. The 12 percent of the sample that formed the "value-for-money" segment were focussed primarily on price and warranty as key product attributes. The remaining 30 percent of the sample place a priority on purchasing wood sourced from New Zealand forests and was somewhat sensitive to product price.

In terms of profiling these segments, results indicate that the demographic variables used in this study do not provide a very thorough basis of identification or description. This finding confirms earlier research (Ozanne *et al* 1999), that found that environmental awareness and concern is very broad based in New Zealand. In addition, this finding suggests the need for additional research to determine more clearly who these groups of consumers are so that manufacturers can more closely align their marketing to particular consumer groups. Identifying these target market segments will become more important in the future as the pressure for environmental certification influences producers in New Zealand, and environmentally certified wood products potentially become more widely available in the domestic New Zealand market.

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Finding markets for New Zealand's certified wood products

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Introduction

Forest and wood product certification provides a guarantee to buyers that their purchase comes from a well-managed forest. This system promotes sustainable and equitable forest management practices (Upton and Bass, 1995). Forest certification may also secure access to environmentally sensitive wood product markets (Stevens *et al.*, 1997).

More and more companies in New Zealand are seeking or being granted FSC¹ or ISO 14000² certificates, and recently some of the main forestry stakeholders met to launch a National Initiative to develop certification standards for all type of forests. Since market access is a key issue for companies seeking certification, knowing the attitude of the markets towards certified wood products (CWPs) is crucial.

Do the domestic or the export markets of New Zealand forestry companies justify the emphasis being placed on certification? Which certification scheme is likely to be most accepted on these markets? The purpose of this paper is to tackle these questions, thus providing decision-support information to forest companies exploring certification options.

Is there a market for certified wood products?

CWPs represent approximately 0.5% of the international wood market (Rametsteiner and Schwarzbauer, 1999; Hansen, 1997; Jenkins and Smith, 1999). Therefore, it is not surprising that

customs and statistical bureaux do not differentiate certified and non-certified wood products (ECE/FAO, 2000; Grist, 2001). Because forest certification is so new and the amount of certified wood in the marketplace is so small, it is difficult, if not impossible, to accurately forecast supply and demand (Hansen and Juslin, 1999). Consequently, analysis of New Zealand's CWPs markets around the Pacific requires consideration of qualitative factors, such as the macro-environment (wood trade flow) and customers' attitudes (the attitude of both industrial clients and final consumers). An important point in relation to customers is the existence and the activity of so-called "buyers' groups". Buyers groups are associations of manufacturers, traders, and retailers committed to increase the use of sustainably-produced wood and wood products, and are thought to be the main driver of certification processes around the world.

Markets for Certified Wood Products

Domestic market

Some studies have found a potential market for environmentally certified products in New Zealand, with consumers ready to pay a premium for CWPs (Bigsby *et al.*, 1997; Ozanne *et al.*, 1999). However, as New Zealand mainly exports the products of its forest resource (Griffiths, 2000),

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1 The Forest Stewardship Council (FSC), founded in 1993, has developed a certification scheme for both forest management and chain-of-custody, and delivers a logo.
2 The International Standards Organisation (ISO) 14000 series of standards, developed in 1996, is a framework for developing, implementing and monitoring environmental management policies. It has no required performance standards and does not deliver a logo.