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Master's thesis

**FUTURE CONSUMERS' UNDERSTANDING OF SUSTAINABILITY IN THE FORESTRY BUSINESS**

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## ABSTRACT

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The purpose of this quantitative research is to study the future consumers' expectation of sustainability in relation to forestry industry as well as the relation of sustainability information and consumers. The aim of this research is to understand how consumers view the forest industry in the future and its products in terms of sustainability as well as how consumers perceive sustainability information that is currently available in the market. An online quantitative survey was used for this research in two countries, namely Finland and Hong Kong during the April to May in 2015. Only primary data is used for this research and it was collected from universities in both countries.

Research results indicated that consumers consider the forest industry is currently sustainable in general but improvement should be done in the future. Their knowledge of sustainability in forest industry seem to be low. Consumers from Hong Kong and Finland have different opinion in forestry sustainability. Consumers in Hong Kong seem to be more critical in its sustainability performance. In terms of the relation of sustainability information and consumers, they do not search sustainability information often but do read it if it is available on packaging. Consumers claimed to take the information into account when they purchase if it is available on packaging. Label is found to be more helpful than words in information presentation. In addition, label with scale and short explanation is found to be the most useful label formulation for consumers.

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This whole process was not easy, and it was a long journey. However, I would say it has been one of the most valuable learning process of my whole study. I got to learn this new topic and conduct a quantitative study. It was full of fears and fluctuations. At some points, I thought I will never get this done.

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# 1. INTRODUCTION

## 1.1 Background

The concept of sustainability development was officially introduced and openly discussed in 1987 by Brundtland Commission during The United Nations World Commission on Environment and Development (WCED) meeting, defined as “Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” It was then well identified the goals of sustainable development in 2005; they are so-called the “three pillars of sustainability”. Precisely, they are economic development, social development and environmental protection (United Nations General Assembly, 2005).

There are plenty of sustainability-related studies that are on different perspectives (Chan, 2001; Han et al., 2009; Edwards & Laurance, 2012), across cultures and countries (Zhu et al., 2013) and industries (Zhu et al., 2013; Cai & Aguilar, 2013a) However, researches on consumer-orientated sustainability are often conducted by examining a certain product groups. Food and beverage is the most common category among consumer goods (Teisl et al., 2008; Grankvist & Biel, 2001). Forestry sustainability has not been widely studied and perhaps, existing researches are more focusing on the relation between consumer concern on forestry sustainability (Panwar et al., 2010; Toppinen et al., 2014), purchasing preferences and other consumer behaviour in forestry products (Teisl & O’Brien, 2004; Carrigan & Attalla, 2001; Cai & Aguilar, 2013a; Cai & Aguilar, 2013b).

This thesis tried to contribute on the field of sustainability, focusing on consumer understanding and expectation of forestry sustainability as well as the relation between consumers and sustainability information.

## 1.2 Research questions and research objectives

Sustainability has been researched and talked for decades, the need for being sustainable is getting bigger, not only from the perspective of manufacturer but also the consumer side. Therefore, it is necessary to study consumer behaviour in this field and their actual consumption regarding to sustainable-labelled products. When talking about sustainable products, eco-label is an important tool in terms of delivering sustainable information and product differentiation. This research is going to discuss and study all of the above; there are two main research questions:

- (1) What are consumers' current understanding of sustainability in forestry business and their expectation of it in the future?
- (2) How consumers perceive sustainability information that is available in the market?
  - Do they search for sustainability information when doing general purchase?
  - Where and what kind of information consumers would appreciate? (e.g. labels, digital, symbols, numeric, on the product, on the shelves, on Internet, by mobile applications etc.)

The objective of this study aims to achieve a deeper knowledge of the research questions, i.e. the understanding and expectation of forestry business as well as consumers' perception of sustainability information.

General objective is to assess the knowledge of sustainable consumer behaviour To be more specific, this research is trying to assess knowledge regarding consumers' expectation on sustainability in forestry business in the future, the knowledge of consumers' preferences, habits and relation with sustainability information concerning forestry products.

Data collection were done in two countries from consumers with similar profile, that is, the young population with tertiary education. Therefore, results are compared according to different variables such as age, gender, country, monthly income and spending as well as study majors. Researcher tried to seek relations between these variables and the research questions. For instance, trying to see whether gender has effect of sustainability information preferences or education background has influences in consumers' attitude on a certain sustainability topic.

### **1.3 Delimitations**

Sustainability is a rather board topic, it can be related and extended to many different topics and fields. It can be studied from psychological angle to social behaviour angle to information system. It is essential to select certain streams of literature so that the research topic will not be vague.

Literature about sustainable consumption, sustainable consumer behaviour, forestry sustainability in relation to consumers and sustainability information, including eco-labelling, are selected and included in literature reviews. Since our survey is targeted to consumers, literature should be "consumer-oriented". Studies and researches regarding to corporates, government and policy, as well as actual sustainability implications in manufacturing process are excluded in the research.

In terms of forestry sustainability, the product range is selective as well. The term "forest/wood-related products" is very broad, from wood for construction to berries in the forests. A pre-selected product range that targeted audiences are more familiar with would more appropriate when asking opinion and product knowledge questions. It is helpful in getting better response in survey answers. Response rate can be lower when participants have low or no knowledge on the questioned products. Pre-selected forest/wood product range can avoid receiving a lot of answers that participants just randomly put down.

A broader view of sustainability information is discussed in the research and eco-label is one of the main focuses in the chapter. Consumers' understanding on sustainability

information is discussed, to see how consumers perceive such information in purchasing sustainable products. A few perspectives of eco-label are discussed afterward, problems of current labelling system and designing effective labels are included in the chapter.

In addition to the field of sustainability, forestry sustainability is not a main focus on the whole study; it is for consumer understanding in future sustainability only. In the part of sustainability information, the broader view is taken, trying to identify what kind of sustainability information that consumers appreciate in general sustainable consumption. It is more helpful and useful to take a broader view as more industries and products may benefit from the findings.

#### **1.4 Research Methodology**

This thesis was conducted in the manner of quantitative research. Online survey was the tool chosen to collect primary data. The data was collected from the survey designed for this research in order to provide more concrete evidence on explaining sustainable consumer behaviour.

Survey was distributed online to university students in Finland and Hong Kong. As a result, the amount of respondents in total is 201 which 121 responses are from Finland and 80 are from Hong Kong. Survey data analysis of this thesis is conducted by utilizing statistic software SAS Enterprise Guide. One-way ANOVA is used in the analysis in understanding the relationship between different variables. In addition, frequency test is utilized to support the result explanation.

#### **1.5 Structure of the thesis**

The structure of this thesis consists of six sections. Firstly, there is literature reviews regarding to the thesis's topic: sustainability, forestry sustainability, sustainable consumer behaviour and eco-labelling. We can have better knowledge on how previous study and research results showed and discovered. It helps gain better understanding on the current circumstance of sustainable development has achieved and the issues

that sustainable development is facing. This chapter is aimed to provide a general picture of the concepts of sustainable development and consumption first, then move on to some detailed issues such as influencing factors of sustainable consumption and eco-labelling.

Secondly, a chapter of methodology explains how the survey is designed and more detailed information on data collection. This thesis is a quantitative study which data collection is on a larger scale than qualitative research, more information of how it was done could be found on methodology chapter.

Thirdly, it comes to the result of this study. Data analysis and results are presented in that chapter to show the findings from research surveys. It aimed to answer the research questions and provide insights views from the consumer side.

## 2. SUSTAINABLE DEVELOPMENT AND SUSTAINABLE CONSUMPTION

### 2.1 Sustainable development

In the concept of sustainable development, three dimensions were later introduced, which are environmental, social and economic sustainability in 1992 during United Nations Conference for Environment and Development (UNCED).

Sustainability is a part of the concept of sustainable development. Definitions were developed and indicated by scholars and organisations during for years. Perhaps the definition from Brundtland Commission of the United Nations in 1987: *“sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”* (United Nations, 1987)

In the early stage of sustainability or sustainable development discourses, environmental issues were the major focus. Observations regarding to nature, the relations of nature and human were evolved in sustainable development discussions during previous decade (Redclift, 2005). Redclift (2005) as well indicated in his study that global environmental concerns were reflected and drew more attention in The Rio Declaration (Agenda 21) in 1992. Environmental problems, such as notable climate change and biodiversity loss, were considered to be managed more effectively.

The three pillars or dimensions of sustainability is another discussion that was commonly raised when mentioning sustainable development. In the report from Brundtland Commission, sustainable development was developed into environment, community/society and economic dimension, which business performance should be fulfilling all three dimensions. Figure 1 has shown one of the most common models of sustainable development used in academic discussions. Sustainability exists in the confluence of the three constitutions.

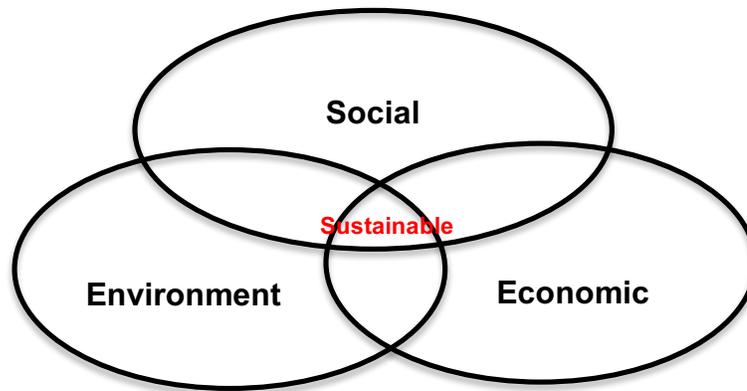


Figure 1: Sustainable development model (McKenzie, 2004)

A newer framework and concept of sustainability was introduced during the mid 90's which is called "The Triple Bottom Line" (TBL) by John Elkington (Slaper & Hall, 2011). This new concept helps measure the impact of an organisation's activities on the world in terms of both profitability and shareholder values and the organisation's social, human and environmental capital (Slaper & Hall, 2011). TBL put business performance into an organised measurement regarding the environmental, economic and social impact of business performance or policy. It makes measuring sustainability for businesses, non-profits organisations and governments more structural and practical.

The significance of sustainability research has been rising in recent years. The amount of literatures and documents of it is expanding in size (Hay et al., 2014). With the increasing amount of sustainability research, it does not seem to getting much closer to a sustainable society.

As the most popular definition from Brundtland Commission stated, sustainable development is the development that meets the "needs", such as population and human resources, food security, energy and accessible housing and services for the poor (United Nations, 1987). All the "needs" that highlighted are human's needs. Therefore, consumers clearly have a role in influencing sustainable development or sustainability through consumerism. This research intended to bring more constructive discussions with empirical data on how consumers behave in consuming and searching for sustainable products.

A brief introduction and definition of environmental, economic and social sustainability are presented in the following, it provides a better understanding of what are these three pillars in sustainable development.

### **Environmental sustainability**

Environmental sustainability focuses on maintaining the health of the life support systems, the systems include water, soil and atmosphere. All of these environmental life-support systems should be healthy and maintained properly (Goodland, 1995).

To simply define environmental sustainability, it is a set of constraints that regulating the scale of human activities in production process: the use of renewable and exhaustible resources on the production side as well as pollution and waste assimilation on the disposal side (Goodland, 1995; Goodland & Daly, 1996). Both production and disposal should be maintained in a good manner to achieve environmental sustainable performance.

The importance of environmental sustainability is that prevailed environment has no limits in future use. It provides resources such as healthy air and water. It is argued that once the environment is destroyed or damaged, any substitute can be found for replacement (Goodland, 1995).

Environmental sustainability is still a very dominate pillar among consumers (Simpson & Radford, 2012; Hanss & Böhm, 2012). Consumers' perception of sustainability was found to be not very diverse. Their perception of it is quite dominated by nature- and environment-related issues (Hanss & Böhm, 2012) In comparison to economic sustainability performance in businesses, consumers respond more negatively when company has a poor environmental sustainability manner in the business than poor economical sustainability (Choi & Ng, 2011).

### **Economic sustainability**

Economic sustainability can be referred to a production process that fulfils the consumption level or demand currently without the sacrificing the future needs (Khan,

1995). The costs, social and environmental cost, of having economic activities and economic growth should be minimised to meet the standard of protecting environmental assets (Morelli, 2011) and not exploiting the positive condition in communities (McKenzie, 2004).

One of the goals of economic development is to reduce poverty and enhancing equity (Barbier, 1987). It is not efficient and not practical to raise up the growth of the third world countries as rich as the developed, scholars suggested to ensure their access to sustainable and secure livelihoods (Barbier, 1987), share resources and maintain population stability (Goodland, 1995; Goodland & Daly, 1996).

### **Social sustainability**

Social sustainability can be very wide in concepts; it can be anything regarding to the community that human activities take place in. It includes the satisfaction of basic human necessities, such as food, water and housing, as well as higher-degree necessities such as freedom, education, employment and urban planning (Brown et al. 1987).

In less developed or developing countries, solving poverty alleviation is a part of social sustainability. Trading off environmental sustainability for improving economic improvement was judged and challenged in the past. A growth-oriented and equity-based environment is needed in maintaining social sustainability so that resource allocation can be optimized in use and fair resource distribution. (Khan, 1995)

Apart from the critiques of either environmental and social sustainability can both maintain in the third world or developing countries, McKenzie (2004) pointed out the fact that social sustainability is often to be overlooked. When thinking business activities in terms of the Triple Bottom Lines, business focuses on economic and environmental aspect of sustainability more often than the social element (McKenzie, 2004). Social justice is often to be overlooked. He cited The Global Reporting Initiative in 1997 which reported that organisations do not report their social performance as frequently and consistently as environmental performance and economic performance.

Social and development sustainability issues are the other most commonly heard sustainability issues among consumers. Apart from environmental issues, social sustainability is another commonly known sustainability pillar in terms of their perception of sustainability (Hanss & Böhm, 2012).

## **2.2 Corporate social responsibility in forestry industry**

This chapter and the following sub-chapters are about corporate responsibility in the forest industry. First, the development of CSR in the forest industry over years is introduced in the sub-chapter in order to understand what forestry CSR is about and how it has developed. Next, the chapter is followed up by consumers' perception of CSR in the forest industry. 'it shows how consumers think and perceive forestry sustainability. Consumer behaviour and sustainable consumption of forestry products can be found at the last sub-chapter.

### **2.2.1 CSR in forestry industry**

Sustainability and corporate social responsibility (CSR) are an evolving movement in business world. CSR is now a part of the societal expectations and stakeholders' demand in business. Forestry industry as one of the extracting industries to have direct impact of the environment by no means can be omitted in adapting CSR into the businesses. (Vidal & Kozak, 2008a) Societal demand on forestry sector have focused on environmental issues because of the high environmental impact of its business nature. Sustainability actions in forestry sector have moved away from meeting the regulations requirement to more advanced actions, such as eco-design, yet more fundamental changes still needed. Unfortunately, in reality even medium to large firms seem reluctant to make such change in their operations because of the large investment that required. Large firms invested large amount of capital into existing technologies whereas small and medium-sized enterprises may hesitate to innovate because of their limited budget (Sharma & Henriques, 2005).

Apart from environmental issues, social related sustainability issues have gained more attention from media and the public. Vidal and Kozak (2008a) conducted a content

analysis based on CSR reports from the global forest sector. The trend of reported sustainability issues in CSR reports changed over time. The global forestry sector strikes for a greater balance among the three pillars instead on strongly focuses on environment (Vidal and Kozak, 2008a). Diversified sustainability performance reporting can be found in forestry companies' CSR reports (Mikkilä & Toppinen, 2008). Base on the top three changes found in the research (i.e. sustainable forestry, economic and human resources for 2005), companies have moved away from purely environmental issues to implement more social and economic issues in their CSR. (Vidal & Kozak, 2008a) In 21st century, CSR concerns in the forest industry have evolved and renewed the focus to global climate change and the role of forests (Panwar et al. 2006).

CSR report is one of the best channels to know the sustainability performance of a company. However, among the three sustainable dimension, social dimension receives relatively less attention than the other two, economic and environmental (Panwar et al. 2006; Mikkilä & Toppinen, 2008). Perhaps it is because of the long established regulations on financial/economic and environmental issues in forestry business (Mikkilä & Toppinen, 2008). With the raising societal demand on social responsibilities, there may be stronger emphasis and institutionalised reporting on social sustainable performance from the forest industry in the future (Panwar et al. 2006; Mikkilä & Toppinen, 2008).

Culture seems to have a role on sustainability issues that a forestry business may emphasise on to in its CSR performance (Mikkilä & Toppinen, 2008; Vidal & Kozak, 2008b). Vidal & Kozak (2008b) found that forestry organisations have different sustainable development focuses according to their origin. For instance, companies from Asia emphasise activities related to waste control (e.g. recycling and emission control) and energy efficiency whereas North American companies focus on sustainable forest management and Latin American companies are especially concerning on community development and education (Vidal & Kozak, 2008).

### **2.2.2 Consumers' perception on CSR in forestry industry**

It should be no doubt that consumers' perception of a company's sustainability performance is crucial in affecting its business. It has influence in pushing more sustainability actions and even the company's financial performance. Sharma & Henriques (2005) indicated that stakeholders have influence in forestry business practices and have strong impact on intermediate sustainability practices in Canada.

Personal values have significant impact on the stakeholder perception of sustainability performance (Wang & Juslin. 2013). For instance, people who are more self-centred care their own benefit more and thus, less critical when judging CSR performance of firms. Therefore, personal value is a factor that shapes a consumer's sustainability preference.

In terms of consumers' perception in forestry sustainability, the view of industry performance between men and women was found to be different. Women are more critical in assessing forest products than men in the US (Panwar et al. 2010a). Toppinen et al. (2014) also indicated that female is more environmentally sensitive in sustainability of wood products. However, another study from Panwar et al. (2010b) using university students as research target did not find gender has impact on CSR satisfaction in the forest industry, unlike study from Panwar et al. (2010a) which targeted US residence in general.

The view on whether education has impact on affecting sustainability conscious is mixed. Wan et al. (2014) suggested that higher educated consumers were found to be more environmental conscious for forestry products in China, yet Toppinen et al. (2014) did not find level of education influences consumers' environmental sensitivity of wood products in Finland. Perhaps, culture is the reason leading this different results. Regarding to major of study, Panwar et al. (2010b) found that study major caused some differences between students' satisfaction of forestry CSR performance. Business and forest ecology/environmental science students are least satisfied with forestry industry

economic responsibilities while forest ecology/environmental science students are significantly less satisfied the performance of social and environmental responsibilities in the forest industry.

Consumers are not that aware and understand the value of green consumerism in forestry industry as the impact is not as comprehensive as other products (Thompson et al., 2009). Consumers may not see their influences in forestry sustainability. Therefore, consumers focus more on benefits that are more evident, for instance, cost, durability and aesthetics of forestry products.

Researches showed that there is market for certified wood products (Ozanne & Smith, 1998; Wan et al. 2014) it may not be a mainstream market for purchasing forest products but the market does exist. The consumption of certified forest products has an explicit connection to the consumers' perception of forestry CSR. It shows their conscious and awareness of sustainability issues and they show their concern by supporting certified products.

### **2.3 Sustainable consumption**

Even though sustainability is not a new concept, and consumers' awareness has been improved when comparing the situation decades ago. However, a gap between the awareness and actual consumption of sustainable products still exists in reality. Zhu et al. (2013) suggested a couple of factors that influence the purchasing intention of sustainable products. Purchasing convenience is definitely one of the reasons that consumers may resist to purchase sustainable products (Young et al. 2010). It means that to improve the availability of green products and wider product range can bring higher consumption on sustainable products. Apart from the availability and accessibility of ecological products, Young et al. (2010) concluded others key factors that increase purchasing intention. For instance, strong consumers' value on buying "green", affordable product prices and experienced ecological consumers can help increase sustainable purchase intention. If these factors are weak or absent, attitude/behaviour gap may appear.

Findings from Yazdanpanah & Forouzani (2015) along with Vermeir & Verbeke (2008) suggested that consumers' attitude towards a product is the determinant and main predictor of their willingness to the actual purchase. Wan et al. (2014) also indicated that sustainable children furniture in China has good market. A positive attitude towards sustainable alternative against traditional regular options is a good beginning to stimulate young adults' willingness to consume sustainably.

However, it is noteworthy that there is a small group of consumers actually believe that ecological products are in a lower quality than the ordinary non-ecological alternatives (D'Souza et al. 2006). The positioning of a product has effect on the actual purchase. If a consumer prioritises a non-green/regular product more than the sustainable option, this prioritising becomes a purchase barrier of an actual green purchase (Young et al., 2010).

Willingness-to-pay (WTP) refers to a premium price for a product. It is characteristic of environmentally concerned consumers who are strongly committed to buy ecological products (Thompson et al., 2009). According to Toppinen et al. (2013), the majority of consumers do have willingness to pay a price premium for certified wood or sustainable wood products, with 1%-5% price premium range.

Result showed the room for sustainable consumption does exist. Numerous studies aim on understanding the population and the range of willingness-to-pay had done for decades (Ozanne & Vlosky, 2003; Teisl & O'Brien, 2004; Andersoon & Hansen, 2004; Thompson et al., 2009; Cai & Aquilar, 2013a). It is possible that consumers are willing to pay a higher price for a product, yet the attributes that drive the actual behaviour is still under studying. Education and income level are some of the reasons suggested to have positive correlation with WTP and the amount of it (Mohamed & Ghani, 2010; Solgaard & Yang, 2011).

When reflecting to the product itself, more sustainability information about the product production was suggested to have impact on WTP (Teisl & O'Brien, 2004; Carrigan & Attalla, 2001; Meise et al. 2014). Therefore, it is essential to know what consumers do care in terms of sustainability from the products. WTP of consumers differs according

to how and what information is displayed. Gleim et al. (2013) found that more details reveal on products could lead to increase in WTP; such decrease in price sensitivity was supported by the concept of value-differentiating information mentioned in Meise et al. (2014).

In wood products market, research results (Toppinen et al. 2013) emphasised two aspects of environmental or social sustainability from the consumers. (1) The impacts of society in general, which do not have clear connection or influence on a consumer's daily life. (2) The impacts with very clear and direct connection with their everyday lives. (Toppinen et al. 2013) From these two attributes, sustainable purchase and significant impact on WTP on wood products are more likely to happen when there is direct impact to consumers, such as health and safety of the product. A meta-analysis of WTP from Cai & Aguilar (2013b) found frequently purchased products are more likely to capture WTP. In addition, WTP will decrease when the item base price increases. (Ozanne & Vlosky, 2003; Cai & Aguilar, 2013b). It suggests that high-priced products are less likely to receive WTP (Thompson et al. 2009).

## **3 CONSUMER BEHAVIOUR AND SUSTAINABILITY INFORMATION**

### **3.1 Consumer behaviour in brief**

Consumer behaviour, also known as buyer behaviour, explains the whole process of how consumers consume a product, from the beginning to the end of the consumption procedure. That is, how consumers select, purchase, use and dispose a product. Consumer behaviour has known as an on-going process, it is not just a monetary transaction between consumers and producers in return of goods and services, it is more than a moment (Solomon, 1996, pp.7). Every business has its consumers, thus, it is necessary to understand consumer's behaviour in order to design nicer purchasing experience as well as create higher customer satisfaction. Different literatures have concluded various factors that affecting consumers' decision and it is important to take those factors into account for marketers.

Expectancy theory can show how consumers purchase or are driven to sustainable products; it suggests that consumers are attracted because they want to achieve their desirable outcomes. Positive incentives have rather stronger effect than the negatives, which pushing the consumers from within. That is, when consumers choose one product over another choice, more positive consequences from those products are expected (Solomon, 1996, pp. 127-128).

#### **3.1.1 Attitude**

Consumers constantly receive information and messages that can influence their decision, inducing consumers to change their attitude. In communicating with consumers, communication model specifies that certain elements should be included in order to achieve the desirable effects of communication. (Solomon, 1996, pp. 191-194) Figure 2 has shown the communication model and the elements that are necessary to be included.

The source of a message or a piece of information definitely carries a big impact of the credibility and the likelihood to be accepted by consumers. Credibility and attractiveness are two important characteristics in source (Solomon et al., 2009, pp. 173-174). Therefore, to distinguish sustainable or ecological products, information that presented to consumers become extremely important in terms of telling the sustainable effects, ethical issues, country of origin and so on. It is worth mentioning how consumers perceive the information source and its credibility. (Solomon et al., 2009, pp. 173) Regarding to sources credibility, knowledge bias can disturb the trustworthiness and influence consumers' attitude since it implies that a source's knowledge about a topic is not accurate (Leire & Thidell, 2005). Consumers' attitude is one of the powerful factors that determine an actual purchase behaviour. When a consumer has doubt on the environmental claims or the credibility of such sustainability information, sustainable purchase intention and the actual purchases would be imbalance. Hence, it drives to a low correspondence between actual green purchases and purchase intention. (Chan, 2001)

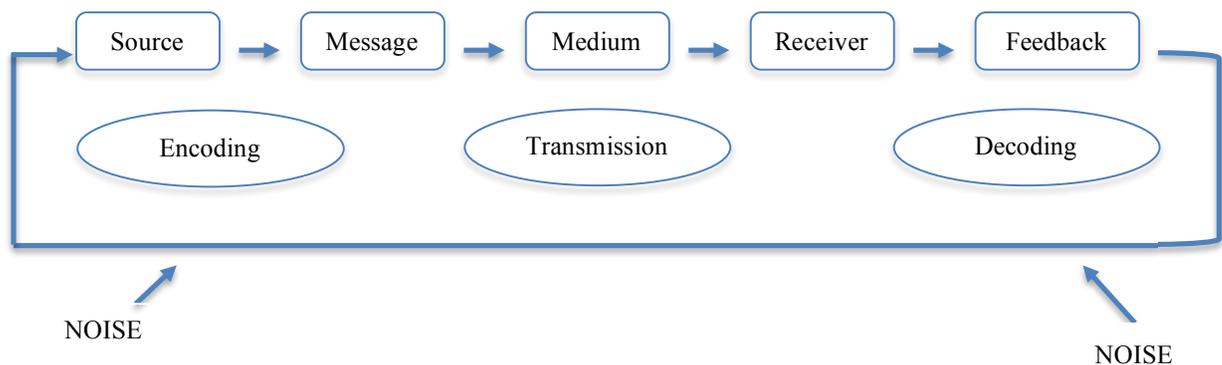


Figure 2: The communication model (Solomon, 1996, pp. 194)

Chan's (2001) study also pointed out that ecological knowledge and ecological affect were found to be the variables that determine Chinese consumers' attitudes toward ecological purchases. The degree of influence of each variable is asymmetric. A con-

sumer's affective responses toward general ecological issues and his/her cognitive understanding of it would shape the attitudes toward the actual green purchases (Chan, 2001). Ecological affect was indicated to have stronger influence towards green purchases than ecological knowledge among Chinese in the same study (Chan, 2001).

### **3.1.2 The product and commercial message**

In commercial message, to contain a brand-differentiate message in communication is an important factor. Unique message that stated the benefit of a product can make a commercial message to be persuasive (Stewart & Furse, 1985).

In commercial message, visual or verbal form of presentation has different reactions and impacts on message delivery. Verbal messages require more effort to be processed, yet, they decay quick when comparing to visual ones (Solomon, 1996, pp. 201). Visual messages can help retrieval over times.

In this research, eco-label or related sustainability information is focused in the study, attempting to understand which would be an effective form of presenting sustainability information on products and how consumers understand such information in consuming such products.

### **3.1.3 Information in decision-making**

Several steps are involved in decision making when consumers intend to make a purchase. Consumers recognise the problem, search for information, evaluate possible alternatives and decide on product choice. Figure 3 presents an overview of decision-making process, showing how is a purchase usually made. Since one of the research questions is about how consumers search for sustainability information, information search in consumer decision-making is the only stage that discussed and focused in this research. (Solomon, 1996, pp 268)



Figure 3: Stages in Consumer Decision Making (Solomon et al., 2009, pp 258)

Information search refers to the process that consumers gather appropriate data to make a better decision, there are some factors involved in information search. Two different types of consumer information search are classified; pre-purchase search and on-going search. (Solomon et al., 2009, pp. 265)

Information source can be divided into two kinds: internal and external source of information. When consumers confront with a purchase decision, they may first search for own memory banks to collect information about product alternatives based on prior experience. As living in a consumer culture, consumers must have some degree of knowledge on products. This action is called internal search, to rely on own memory banks for gathering information of products. (Solomon, 1996, pp. 275)

External search refers to an extra effort on searching information, which means consumers search information in the environment. For instance, observation of others, aiming to fill in the knowledge gaps about products or brands. Learning from previous purchase experience and exposure to advertising, product packaging and sales promotion campaigns help develop memory banks and consumers are able to use the knowledge in internal information search when needed. (Solomon, 1996, pp. 275-276)  
Information gathered from experience has a role in purchasing sustainable products.

In sustainable consumption, research found that consumers rely more on their previous experience in selecting ecological products (D'Souza et al. 2006). Consumers limit the amount of external search for most products because of the assumptions of economics-of-information in information searching process (Solomon et al., 2009, pp. 267). Consumers will gather as much information as necessary to make an appropriate purchase. In application, research results show mixed comments on consumers' effort on

information search. Beatty and Smith (1987) argued the frequency and amount of external search effort is often limited. Consumers want to have information needed as fast and easy as possible which may lead to biased information. In contrast, research result of Hauser et al. (1993) suggested that consumers will put as much effort on collecting data as possible unless the process of it is overly time-consuming and difficult. Consumers take time for searching rational information when needed.

### **3.2 Consumers' perceptions on sustainability information and eco-labels**

Sustainability has been discussed for long and it is widespread to consumer's mind, yet, sustainability is still a broad and diffused concept that consumers often have difficulties in defining it precisely (Grunert et al., 2014; Laureati et al., 2013, Simpson & Radford, 2012; Hanss & Böhm, 2012). Consumers select products according to the information that they receive from different sources; information stated on the products is definitely one of powerful and persuasive sources drive the actual purchase (Thompson et al. 2009).

In consumer behaviour, consumers tend to minimise their effort on information search for decision-making of their purchases (Lynch & Ariely, 2000). Such information is better to be low searching cost, meaning that information should be easy to be accessed on the product as well as to be understood by consumers. Eco-label is one form of presentation in delivering sustainability information to consumers. provide additional information of sustainability to consumers, showing the commitment of the manufacturers in implementing CSR. Boström and Klintman (2008) defined eco-labelling as a form of eco-standardisation; it is formed according to standardised principles and prescriptive criteria. Such eco-standard is market-based and consumer-oriented, consumers differentiate through symbols, offering a common standard to consumers on how a product fulfils sustainability in practices on product display. Most of them are issued and certified through auditing from a third party. Issuing organisations can be from environmental NGOs, federal government, industries and industry associations (Leire & Thidell, 2005).

The concept of value-differentiating information in sustainability information was suggested. It describes the differences of a product's production which make a product stand out among all similar consumer goods on shelves, providing added-value to the consumers (Meise et al., 2014). Besides the availability of sustainability information, it is even more important for consumer to actually understand such information. Without understanding the information, sustainability information is not able to function as it is expected to, that is, pushing for a positive purchasing behaviour.

Researches were done in the past trying to understand how consumer perceive sustainable information and their knowledge of it (e.g. D'Souza et al. 2006; Leire & Thidell, 2006; Rashid, 2009). There are various needs and reasons that tell the importance of such studies. Consumers involve more and more in pushing sustainability and industry's responsibility forward by sustainable consumption. Stakeholders had been proven to have influence in corporate practice (Sharma & Henriques, 2005). Therefore, a profound understand of consumers' perception in sustainability, particularly products related, can be beneficial to marketers in marketing communication as well as policy maker to publish and issue certificates and information that important to them. Moreover, when consumers become knowledgeable, they are more powerful and have greater influence in corporate practices. Consumers are able to resist misleading information from unethical marketing marketers (Simpson & Radford, 2012)

Grunert et al. (2014) found that consumers do have strong concern on sustainability, however, the use of sustainability information is unclear. Research results showed different views on this topic. Grunert et al. (2014) found that the use of such information is rather low level, price is still on the top ranking list among others product information whereas results from D'Souza et al. (2006) indicated the majority of research respondents claimed to always read eco-labels on the products. D'Souza et al. (2006) further explained the phenomenon. Providing informative labels will result in more informed consumer decision and product selection but will not necessarily overcome their price

sensitivity. From a business perspective, it provides opportunities to differentiate themselves in competitive markets and potentially increase their marketing share and profits (Teisl et al., 2001).

The understanding of sustainability information as well, not very positive in some studies. Even though Rashid (2009) and Grunert et al. (2014) reported consumers with higher concern in sustainability seem to have higher understanding in sustainability information, it may not always be the case. Research from D'Souza et al. (2006) and Hoek et al. (2013) indicated that some consumers believe sustainability information is difficult to read that they do not completely understand. Technical terminology and vocabulary that used seem to affect the level of information understanding. For instance, technical terms such as market incentive, environmentally friendly, eco-system diversity and sustainability participants were told to be not easily comprehended (Teisl et al., 2000) D'Souza et al. (2006) as well suggested that the used of terminology, the layout of the information or even information label size and legibility could be the reasons behind. Information presented in statistical layout, such as bar chart, is found to not be easily understood, consumers are confused with this kind of layout (Teisl et al., 2000). Consumers also stated there is understanding differences across products when they read product ethical information. For instance, ethical issues of buying food products is more readily than cars and vehicles (Wheale & Hinton, 2005). In addition, Nilsson et al. (2004) pointed out that consumers had difficulties in separate different information content. Even though more instructions and details are revealed on websites but certifying organisations may have to develop other methods to reach the consumers (Nilsson et al. 2004).

The positive effect of sustainability information on products has been doubted in another study, wondering the encouragement of sustainability information contributes to the actual sustainable consumption. Hoogland et al. (2007) research result suggests that sustainability information can have encouraging impact on consumers' purchase decision only if their personal values match with the sustainability information

The understanding of sustainability information can be very broad, from the environmental impact to the product to the actual eco seal and label recognition are a part of the understanding. Leire & Thidell (2005) stated the recognition of eco-label in the Nordics is rather strong. Except Iceland, which was still about half of the research population, the very majority of the Nordic countries (i.e. Sweden, Finland, Denmark and Norway) respondents stated they have seen and can identify the Nordic Swan label. However, research result was opposite in Malaysia. Even though the national eco-label was launched since 1996, consumer awareness of it is still negligible (Rashid, 2009). Ozanne & Vlosky (2003) agreed that more work for those who certified their products and the certifiers should be done to raise awareness and inform consumers about the role and the meaning of product certification.

Both Leire & Thidall (2005) and Rashid (2009) stated that educating consumer in recognising and reading eco-labels and the meaning of certification is not enough in helping the raise of sustainable consumption. Not only consumer knowledge of eco-labels should be increased, but also the environmental impact and attributes of the sustainable products as well. Failure to do so would mean consumers could not make the best choice that fulfil their intention to buy an eco-friendly product because of their inability to discern between sustainable and ordinary non-sustainable products (Rashid, 2009).

### **3.2.1 Information credibility and effective sustainability information**

Eco-labels as a form of sustainability information presentation, there are a large variety of labels and certifications in the market for different products. The reason of increasing coverage of certified and eco-labelled products in the market is because of environmental non-government organisations (ENGOS) and environmental activists. Movements, protests, critics may possibly lead to boycott of certain products or brands that are considered as non-environmental friendly or non-ethical. (Gulbrandsen, 2006; Potts et al. 2009) When the amount of labelling and certification schemes increase, the confusion and doubt from consumers seem increase simultaneously. Great numbers of labels available in market has brought confusion to consumers when selecting ecological products (Leire & Thidell, 2005; Hanss & Böhm, 2012).

The credibility of sustainable claims and eco-labels was discussed and explored repeatedly in various researches over times (e.g. Thøgersen, 2002; Ozanne & Vlosky, 2003; Teisl et al. 2004; Hoek et al. 2013; Gleim, 2013). The credibility is often criticised or challenged by consumers because of different reasons. As mentioned previously, consumers may understand the information comprehensively, but confusion in respect of the label will cause mistrust in communication (Thøgersen, 2002).

Aside from the confusion, information presented on products seem not perfect based on multiple studies (Horne, 2009; Thøgersen, 2002; Teisl et al. 2004; Marucheck et al. 2011; Grunert et al. 2014). Lack of information was indicated by scholars (e.g. Nilsson et al. 2004; Young et al. 2010; Meise et al. 2014) Consumers require transparency in sustainability information, supply chain information in particular was indicated as valuable to consumers (Chan, 2001; Meise et al. 2014). In addition, consumers demanded to have more diverse information (Young et al. 2010). Teisl et al. (2001) argued that environmental groups may put wrong emphasises on the information, suggesting the information provided is not in consumers' interests. Eco-label is often presenting product's sustainability information on single field. For instance, sustainability information for home electronics can be more than just telling environmental impact of the product but actually the company social and environmental policy as well.

Consumers' knowledge of sustainable attributes of ecological products, certifying organisation and the source of sustainability information are the reasons that influence the credibility of sustainability information (Teisl & O'Brien, 2004; Leire & Thidell, 2005). Consumers feel hesitate to trust the claims. Companies may have just found a way to claim their products to be environmental friendly in order to fit it the sustainable trend that is going on in the market (Teisl et al. 2004). Fault information and green washing may ruin the trust between both parties. Consumers found sustainability claims to have weak legal definition and standard (Hoek et al. 2013). They are rather empty in meaning and not very reliable. It is essential for trade network organisers and industries to retain, review and restrict the regulation and instruction of their membership in order to maintain the reputation from consumers (Gulbrandsen, 2006).

Besides, low understanding of product sustainable attributes results in misunderstanding or misinterpretation of the information (Leire & Thidell, 2005), credibility of the claims would be doubted. In terms of certifying organisation, environmental non-governmental organisation was found to be the organisation that is the most trustworthy issuing institutes among consumers (Ozanne & Smith, 2005; Ozanne & Vlosky, 2003).

### **3.2.2 Designing effective sustainability information**

Getting right information to be shown on product packaging is essential when communicating with consumers, and it is the same case to eco-labels. On-packaging information is the only material that is used to communication with potential consumers before their purchase. Correct and appropriate information that displaying on labels can target the consumers directly and affect sustainable consumption.

In the content of sustainability information, multi-dimensional information should be presented to consumers (Teisl et al. 2001; Young et al. 2010). However, Teisl et al. (2003) indicated that excessive information and the most detailed label do not have significant effect on increasing the credibility of an eco-label. Therefore, brief information that is readable to consumers with less sustainability knowledge would be ideal.

Environmental and social, such as human rights and animal rights, were particularly important and frequently addressed. They are the issues that in consumers' top interests when receiving sustainability information. (Wheale & Hinton, 2005; Hanss & Böhm, 2012) These particular information perhaps encourage consumer who cares and appreciates to consume sustainably. It is useful to design product information and select the suitable eco-labels on products. Nonetheless, in reality, consumers' value is not homogenous, which there is no universal sustainability information to match everybody's interest. More research according to industry will benefit in this field.

In regards to format and layout, negative information was found to have more influences than purely positive information to consumers with intermediate environmental concern (Grankvist et al. 2004). Therefore, Grankvist et al. (2004) suggested the de-

velopment of the labelling system should be a system with levels, with neutral and negative outcomes; namely the EU Energy Label could be an example of such labelling system. Figure 4 shows an example of European (EU) energy label for household washing machines. It presents information in a more diverse format by telling where a product locates in energy usage spectrum.

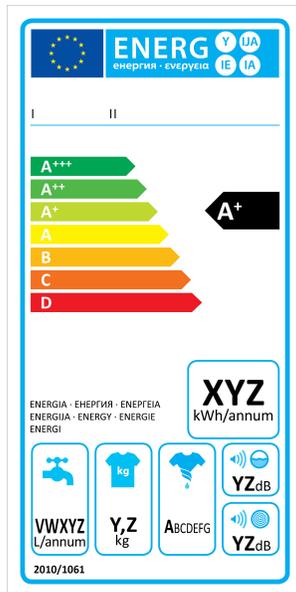


Figure 4: Example of EU energy label for household washing machines (European Commission, 2016)

Boström & Klintman (2008) judged that no existing labels are able to present the right trends and standardise the system. Introducing a standardised labelling system that integrates the right information would help the identification of sustainable products and perhaps facilitate sustainable consumption (Young et al. 2010). In fact, lack of time for research is one of the main barriers in purchasing sustainable products (Young et al. 2010), standardised and well-established certifying system can be used as a decision short-cut. Consumers often feel stressful in shop and they do not want to spend long time in stores just for gathering information. (Hoek et al. 2013) Such decision short-cut that is reliable can indeed encourage sustainable consumption by helping consumers to make fast decision in sustainable products.

## **4. METHODOLOGY**

This chapter discusses details of the research that was conducted for this thesis. First of all, the introduction of the research is discussed. It shows how the research can be utilized in a wider context and the method of the study. Next, the sample and the data collection are introduced. There is more information on the research process and how the sample was chosen. Furthermore, more detailed data on the background of respondents is presented in order to have a good understanding on them. Last, it comes to the survey design. It indicates the process of creating the survey and provides information on the survey testing before moving on to the result and analysing chapter.

### **4.1 Introduction**

Literature reviews in the last chapter provides an overview of previous studies in the same fields, regarding to consumers, sustainability and sustainability information. To understanding and organise a clearer picture of how these elements inter-related and co-ordinate together. Literature reviews serves as the foundation for this research. On the other hand, primary data aims to answer the research questions and objectives stated in this paper by giving evidence, to support the research.

Sustainability-related research towards forest industry is not something radical. It is not rare to find studies that related to forestry sustainability or consumers' opinion on forest products (Castañeda, 2000; Aderrson & Hansen, 2003; Ozanne & Vlosky, 2003; Topinen et al., 2013; Holopainen et al., 2014). When consumers make purchases on sustainable products, sustainability information is in an essential role in decision making process. This thesis perhaps will contribute in investigating consumers' understanding of sustainability in forestry business and how they perceive sustainability information that is presented.

The topic can benefit researchers, industry practitioners and policymakers to understand how consumer behaviour is regarding to sustainability information searching. It is important to know what information consumers value for and their perception of it. A

better understanding on such issues may create possibility to fill in the gap of sustainable purchase intention and the actual consumption.

This research is a quantitative research. Survey was used and distributed in Finland and Hong Kong. Quantitative research allows researchers to reach relatively larger, more representative respondents samples and numerical calculation of results (Saunders et al., 2009). Survey was chosen as the data collection method because of its efficiency in gathering meaningful data. Since respondents were asked the exact same set of questions, it is a rather efficient way to collect responses in terms of time and sample size. Further, survey is an easier channel to reach respondents in Hong Kong online.

In this research, online survey was used because of the research circumstance. Through Internet, it has less constraints in terms of locations, time zones and accessibility. Since survey targets to people in Finland and Hong Kong, across cities and countries, Internet-mediated questionnaire is one of the best options to reach the population if it is not the best.

Qualtrics was the tool used to conduct survey. Qualtrics is an online survey tool and platforms that collects, stores and analyses data. Since respondents were expected in different countries, it is a good tool for the research. Qualtrics is easy to use, it allows researchers create different question types and provides flexibility in customise questions and survey languages. Apart from all mentioned advantages, Qualtrics is a good tool for online distribution as well.

This research is a part of a research project “Forescof – Searching for Sustainable and Competitive Future for the Forest Sector”. Researcher’s personal background of this thesis is the reason Hong Kong was chosen particularly. Since there is connection to the targeted country, the barrier of reaching the respondents is lower.

University students was chosen because of two main reasons. First, university students represent the young population. Lenten et al (2001) indicated that radical changes are more likely to be accepted by young people (cited in Yazdanpanah & Forouzani, 2015). As they are in the end stage of developing their personal beliefs and values, as well as

forming own identity (Vermeir & Verbeke, 2008), it is possible that they accept the changes and develop new habits, they tend to stick with them in the future. Therefore, they are the future consumers and also possible to set the ethics and business responsibility level in the future. Moreover, students are a group of population that appear in several studies regarding sustainability and sustainable consumption (Grankvist et al., 2004; Vuylsteke et al., 2010; Laureati et al., 2013; Holopainen et al., 2014; Yazdanpanah & Forouzani, 2015). It is fairly common to choose student to be study target.

The second reason of choosing university students as target respondents is because of the accessibility of the population. As data collection was done by two university students, this group of people is more accessible for them. This makes the data collection method more appropriate in these circumstances.

## **4.2 Data Collection**

The empirical part of the research is referred in the following chapters. Relevant discussions are contained in this chapter including description of the sampling, survey distribution process and coding processes. Apart from literatures used previously, primary data collected for the purpose of this research as well. In Finland, the data was collected via surveys from the students of three universities in Finland; Lappeenranta University of Technology, University of Turku, and University of Helsinki. Due to the personal connections to these universities, it is more accessible to research conductors to reach out the respondents. E-mailing lists were used for the survey distributed in Finland. In Lappeenranta, the survey was distributed in study related social media group for the additional exposure.

There are 40,000 students in The University of Helsinki, however, the survey was distributed in the faculty of agriculture and forestry. There are 2,700 students in that faculty (University of Helsinki, 2016). It was sent to the students through emailing list and with help from a member of the faculty.

University of Turku is a research university that has 19,488 students (University of Turku, 2016a) and seven faculties (University of Turku, 2016b). Survey invitations were mainly sent to Turku School of Economics for this study through university emailing list by study service. Such emailing list is able to reach all degree students and is used for sharing study information.

Lappeenranta University of Technology has three schools with approximately 4900 students (Lappeenranta University of Technology, 2016). The survey was distributed with assistance from the student service via emailing lists. The emailing lists are used for sharing study information and student events. To increase the exposure and promote the survey, survey link was shared to study-related social media groups that Finnish and international students were using in 2015.

In Hong Kong, survey was conducted mainly through researcher's personal connections with the four universities' students. The four universities are The Hong Kong Polytechnic University, City University of Hong Kong, The Education University of Hong Kong and The University of Hong Kong. The survey was spread out mainly through word-of-mouth. To increase the amount of respondents and the visibility of the survey, it was then posted to the education and study sector in an online forum (<http://www.discuss.com.hk/forumdisplay.php?fid=44>) where students share and exchange education-related information.

The Hong Kong Polytechnic University has 31,864 students, consisting six faculties; Faculty of Applied Science and Textiles, Faculty of Business, Faculty of Construction and Environment, Faculty of Engineering, Faculty of Health and Social Sciences and Faculty of Humanities (The Hong Kong Polytechnic University, 2016).

City University of Hong Kong has 20,032 students and 8 colleges that are College of Business, College of Liberal Arts and Social Sciences, College of Science and Engineering, School of Creative Media, School of Energy and Environment, School of Law and School of Graduate Studies. (City University of Hong Kong, 2016)

The Education University of Hong Kong is a tertiary institute that delicate to teacher education. The university has 8684 students and four faculties; Faculty of Liberal Arts

and Social Sciences, Faculty of Education and Human Development, Faculty of Humanities and Graduate School. (The Education University of Hong Kong, 2016)

The University of Hong Kong has 27,933 students and 10 faculties; Faculty of Architecture, Faculty of Arts, Faculty of Business and economics, Faculty of Dentistry, Faculty of Education, Faculty of Engineering, Faculty of Law, Faculty of Medicine, Faculty of Science and Faculty of Social Sciences. (University of Hong Kong, 2016)

### **4.3 Survey design and data analysis method**

The survey was co-created with both “Forescof” project members and another Master’s thesis researcher. Comments and guidelines were given by the project member and thesis supervisor during the process of survey design. In order to get the data needed in once, the survey is a combined questionnaire that collects data for two master’s thesis. The survey is divided into six categories with 11 background questions and 22 sustainability-related questions. The five categories are general consumer behaviour, sustainability in general, consumption of ecological products, eco labels and forestry sustainability respectively. The order of the survey questions was planned and positioned in a manner of minimising the probability of misleading the respondent.

Close-ended questions would mainly be used in the survey; multiple choices questions and scaling questions are asked to examine consumers understanding and expectations. Survey was created in English and revised. Since Hong Kong was one of the chosen location, English was translated to traditional Chinese in order to reduce language barrier and maximise the response rate. By translating the survey in local language can minimise the possibility of misunderstanding, for both questions and received data, it helps increase the reliability of the data. The completed survey is available in appendices.

Pre-test was conducted with students in Lappeenranta University of Technology before the final data collection, to gather comments and test out the questionnaire. This can prevent misunderstanding from questions and error in answering. A small group of 8

students attended the pre-test. No major mistakes were reported; minor adjustments were made before it was set to the public.

After answers were received, it proceeded to analysis stage. Data was analysed by statistical data analysing programme, SAS Enterprise. Analysis of variance (ANOVA) was used in order to find out if there are any significant results could be found between groups (i.e. age, country, study majors etc.). ANOVA is one of the statistical models that used to analyse the differences among group means and their associated procedures. By using ANOVA, more detailed information can be revealed whether there is connection between our survey answers and certain group of respondents. In addition to ANOVA test, frequency test was used to understand the frequency of consumers' action and behaviour.

## 5. RESEARCH RESULTS AND ANALYSIS

The empirical results are analysed and discussed in this chapter. Descriptive information of survey respondents is presented and explained at the beginning of the chapter. Data analysis was done individually even though the survey design was co-created with another student.

### 5.1 Coding survey answers

The majority of the questions are statement questions based on the Likert-scale, either naturally marked in numbers or are coded later in analysing process into numbers. There was not major adjustment in coding survey answers. For detailed information on survey's Likert-scale, it can be referred to Appendix 1. However, for one independent variable, study major, answers were coded differently with assistance from Doctoral Degree student from Lappeenranta University of Technology.

Respondents are originally from 12 different study fields. All 12 groups had been reorganised to four study fields only during the data analysing process. These four fields are now humanities, natural sciences, social sciences and agricultural and forestry. Table 1 shows details on how these four majors were coded and what each of them includes.

Table 1: Coded study majors

<b>Coded study majors</b>	<b>Study majors included</b>
Humanities	Art, Humanities, Education
Natural Sciences	Medicine, Mathematics and Natural Sciences, Information Technology, Engineering
Social Sciences	Social Sciences, Business and Economics, Law
Agricultures and Forestry	Agricultures and Forestry, Others

## 5.2 Descriptive information of the respondents

This sup-chapter is going to introduced the descriptive information of respondents. It provided information of sample population.

Table 2: Descriptive data

	Category	N	%		Category	N	%
Completed survey	Yes	142	70.65	Study status	Fulltime	116	57.71
	No	59	29.35		Part time	24	11.94
Country	Finland	121	60.20		Not at all	61	30.35
	Hong Kong	80	39.80	Study major	Humanities	22	11.28
Nationality	Finland	71	35.32		Natural Sciences	66	33.85
	Hong Kong	87	43.28		Social Sciences	95	48.72
	Others	43	21.39		Agriculture & Forestry	12	6.16
Age	Under 20	18	8.96	Work status	Fulltime	85	42.29
	21-25	120	59.70		Part time	47	23.38
	26-30	48	23.88		Not at all	69	34.33
	31-35	10	4.98	Monthly income (€)	0-499	60	29.85
	36-40	3	1.49		500-999	42	20.90
	41-45	2	1.00		1000-1499	35	17.41
	45+	0	0.00		1500-1999	29	14.43
Gender	Male	111	55.22	2000+	35	17.41	
	Female	89	44.28	Monthly spending (€)	0-399	54	26.87
	NA	1	0.50		400-799	80	39.80
Children	Yes	4	1.99		800-1199	41	20.40
	No	197	98.01		1200-1599	20	9.95
					1600+	6	2.99

Table 2 presents all independent variables in this research. This research received a total amount of 201 responses through the web survey in Qualtrics. However, there are 142 responses are completed survey, meaning that there were participants that quitted the survey in progress or skipped some of the questions as only background questions were set as obligatory questions. Web survey was designed for two separate theses, thus, the length of the survey was not ideal. Therefore, the completion rate of the survey is 70.7%, which is not very high. Nonetheless, all answers were used for data analysis.

Responses were collected from two locations, Finland and Hong Kong. Although not all of them are originally from Finland and Hong Kong, they are the main ethnic groups that were collected from. The whole sample was represented closely to equally by 55% of women and 44% of men.

Since the target respondents are younger generation with tertiary education background, not all age groups were expected from respondents. The age distribution is fairly focused on a range. The majority of the respondents are quite young, 120 respondents (59.7%) were from the age group of 21-25. It is natural because the sample consists mainly students in this research. Overall, respondents from 21-30 years old is the age range that most respondents fall into, accounted for 168 respondents (83.6%). According to the nature of respondents, university students, most of the respondents came from social sciences education background, accounting for 48.7% (N=95) of the research population.

Full time and part-time students made up 69.6% of the responding population, which 116 (57.71%) respondents are full time students. Both full time and part time students' responses are naturally included in the analysis. There are 61 (30.4%) respondents state they are not students at that time. However, these non-student population is not omitted from the data analysis. By further questioning their working experience, these people are assumed that they are recent graduates so they are not far from being students. Moreover, 43 out of these 61 non-student respondents are from the age group 21-26 years old, showing that they as well represent the young population. Thus, they are still match with the characteristic of the study, i.e. future consumers.

Many of the respondents stated they work but half of the population (50.7%) of respondents earn between 0-999€ monthly. The monthly income of respondents is fairly low, yet 64 (31.8%) respondents indicated that they earn more than €1500 per month. Regarding to respondents' spending, many respondents (80 or 39.8%) stated they

spend €400-799 per month. In addition, the majority of the respondents (134 or 66.67%) spend less than €800 monthly.

In the following chapters, results are reported in the manner of answering research questions. Therefore, questions are grouped based on the research question they relate to. Background questions belong to the first group, which tell about the respondents who answered the survey. It is presented and explained in details in the previous section. The answers to the statement type questions are analysed in reflection of different variables, gender, country of response and relevant statistically significant variables. All data is generated by using One-way ANOVA or frequency test.

### **5.3 Results**

The following sub-chapters portray and discuss the results of the quantitative analyses of the data collected from survey. The results are shown in the order of research questions that they answer.

#### **5.3.1 Consumers' current understanding of sustainability in forestry business and future expectation**

The analysis starts with the first main research question i.e. what are consumers' current understanding of sustainability in forestry business and their expectation in the future. These can be referred to survey questions 32, 33, 34 in section six. Three statements in survey question 32 are related to consumers' current understanding of forestry sustainability and the rest of the two statements are related to their future understanding.

The first three selected statements of question 32, as well as question 33 are related to consumers' current understanding. Statements 4 and 5 in question 32 as well as question 34 are related to their future expectation of forestry sustainability. The survey used in this research is fully available in the appendices at the end of this thesis for reference.

Table 3: Mean and SD values of Q32. (1=strongly disagree, 7=strongly agree)

Statements	Mean	SD
1. The forest industry is sustainable.	5.15	1.46
2. The sustainability of the forest industry should be improved.	5.75	1.21
3. The forest industry has a big impact in improving global sustainability.	5.72	1.30
4. In the future there will be more diversified use for wood than today.	5.64	1.31
5. I think sustainably managed forest is the future of forestry industry.	5.51	1.30

Table 3 displays all mean and standard deviation values of Q32 as a summary of all statements. First of all, overall the respondents generally agree on the statements with over 5 in average mean. Respondents think that forestry industry is sustainable (mean=5.15) but they also agree, the most in all statements, that “The sustainability of the forest industry should be improved” (M=5.75). It seems that respondents somewhat believe that forestry industry practice is sustainable but it should still be improved in the future as it can be reflected from another statement that respondents agree the second highest “The forest industry has a big impact in improving global sustainability” (M=5.72).

Table 16 (appendix 2) and Table 5 show the SAS output and ANOVA results of all statements in question 32. Based on the results displayed in Table 5. One-way ANOVA of Q32 shows there are significant differences between age and study majors. Country of response and gender do not have statistically significant differences. The P-values are displayed in red if they are lower than 0.05 which means the test results are statistically significant. The results show that two groups, age and study major, have statistically significant results to most statements. Next, for Q32 statement 2 “The sustainability of the forest industry should be improved” has no statistically significant differences between all groups that are shown in Table 3.

Table 4: One-Way ANOVA Section 6 Q32

Please answer these questions based on the knowledge, belief, or image that you have of forest industry. (1=strongly disagree, 7=strongly agree)

		Country		Gender		Age					Major				
		HK	FI	M	F	<20	21-25	26-30	31-35	36-40	41-45	H	NS	SS	AF
1. The forest industry is sustainable.	M	4.92	5.26	5.1	5.19	4.20	5.15	5.57	5.00	3.00	4.00	4.94	5.07	5.03	6.50
	SD	1.48	1.45	1.64	1.31	1.03	1.50	1.24	1.63	1.41		1.57	1.53	1.39	0.67
	P	0.18		0.94				0.03				0.009			
	F	1.85		0.07				2.59				4			
	N	151		151				151				151			
2.The sustainability of the forest industry should be improved.	M	5.51	5.88	5.67	5.83	5.40	5.75	5.92	5.70	5.00	6.00	4.94	5.07	5.03	6.50
	SD	1.32	1.14	1.36	1.08	0.97	1.23	1.25	1.16	1.41		1.64	1.19	1.10	1.40
	P	0.077		0.72				0.80				0.67			
	F	3.180		0.34				0.46				0.52			
	N	150		150				150				150			
3.The forest industry has a big impact in improving global sustainability.	M	5.71	5.73	5.7	5.76	5.10	5.58	5.83	6.00	5.50	7.00	5.40	5.62	5.59	6.75
	SD	1.04	1.42	1.39	1.22	1.37	1.35	1.21	0.94	2.12		1.50	1.47	1.15	0.45
	P	0.16		0.45				0.47				0.0224			
	F	2.03		0.81				0.92				3.29			
	N	150		150				150				150			
4.In the future there will be more diversified use for wood than today.	M	5.45	5.74	5.65	5.66	5.30	5.56	5.42	5.50	5.50	6.00	5.13	5.50	5.42	6.75
	SD	1.3	1.29	1.37	1.24	1.16	1.20	1.65	1.27	2.12		1.60	1.26	1.25	0.62
	P	0.92		0.34				0.98				0.005			
	F	0.01*		1.08				0.14				4.47			
	N	149		149				149				149			
5.I think sustainably managed forest is the future of forestry industry.	M	5.29	5.62	5.62	5.43	5.70	5.71	5.89	5.80	2.50	6.00	5.60	5.61	5.77	6.25
	SD	1.3	1.31	1.36	1.27	0.95	1.21	0.35	1.55	2.12		0.99	1.47	1.26	1.22
	P	0.19		0.40				0.0214				0.47			
	F	1.72		0.93				2.74				0.84			
	N	150		150				150				150			

For the statements that refer to the consumers' future forestry sustainability expectation, there are statistically significant differences between study majors ( $P > F = 0.005$ ). It seems respondents with agriculture and forestry major agree more on statement Q32 statement 4 "In the future, there will be more diversified use for wood than today". For statement Q32 statement 5 "I think sustainable managed forests the future of forestry industry", statistically significant differences can be found in age group, mean values show that respondents across all age groups agree on the statement expect age group 36-40 years old, with negative attitude to the statement ( $M = 2.5$ ).

Table 5: Mean and SD values of Q33 (1=strongly disagree, 7=strongly agree)

Statement	Mean	SD
Compared to other natural resource based industries, the forest industry has invested a lot to improve its sustainability	4.83	1.31
Compared to other industries, the forest industry's environmental performance is weak	3.72	1.52
Forest industry has a weak reputation for social issues	4.28	1.37
In general, forest industry does not violate labour rights in developing countries	3.81	1.37
The actions of forest industry decrease the quality of life of local people	4.09	1.39
The forest based products are in general sustainable, since wood is renewable material	4.4	1.52
Activities of forest industry have negative impact on forest biodiversity	5.03	1.41
The resource efficiency of the forest industry is low	3.97	1.32
The energy efficiency of the forest industry is low	4.02	1.33
The way the forest industry is using water resources is unsustainable	4.18	1.2
Forest industry emission decreases the quality of air	4.42	1.24
Forest based products are carbon neutral	3.93	1.35
Wood from tropical plantation is more sustainable than wood from boreal forest	3.55	1.63

Table 5 shows the basic statistics of all statements in question 33. Question 33 concerns about consumers' current opinion and impression of forestry sustainability. This

question contains 13 statements and respondents were asked to rate the degree of which they agree or disagree with each statement.

Judging by the standard deviation values of the statements, consumers seem to have different views on issues. In general, consumers think that the forest industry has invested a lot to improve its sustainability. The effort of the industry has put is recognised and affirmed by consumers. They agree that the emission from forest industry decreases the quality of air and its energy efficiency is low. However, consumers still view the forest industry in rather positive way in terms of environmental performance.

On the other hand, in terms of social performance, consumers hold opposite views to relevant issues. They disagree the forest industry does not violate labour rights in developing countries. Moreover, they agree that forest industry has a weak reputation for social issues and the actions of the industry decrease the quality of life of local people.

Table 17 (appendix 2) and 6 show all SAS outputs and One-way ANOVA results of statements in question 33 across country of response, gender, age and study major. In the section, respondents from Hong Kong and Finland show different opinion to some of the environmental and social issue statements. In general, consumers in Hong Kong seem to have more negative impression to the forest industry than people in Finland. Detailed breakdown of statements' ANOVA value is discussed in the following, more information of respondents from both countries is revealed.

There are no statistically significant results found in three statements across all groups. Referring to their P-values, they are "In general, forest industry does not violate labour rights in developing countries", "The way the forest industry is using water resources is unsustainable" and "Forestry industry emissions decreases the quality of air".

There are some statements are found to have strong statistically significant differences in some of the groups. Country of response and study major are the two groups that have significant results in many statements. In the statement "Compare to other natural resource based industries, the forest industry has invested a lot to improve its sustainability", respondents in Finland (M=5.07) agree more on the statement than people in Hong Kong (M=4.37), according to One-way ANOVA means values. Respondents in

Finland seem to have stronger believes in forestry industry's investment in sustainability improvement. Results above are statistical significant with P-value 0.0015. Study major is found to have statistically significant differences as well ( $Pr>F=0.0001$ ), the significant differences are stronger than country of response, judging by their P-values. People from different study majors seem to have rather similar opinion to the statement, except agriculture and forestry ( $M=6.33$ ). Respondents from this particular major held the strongest positive attitude to the statement, agree that forest industry has invested a lot to improve its sustainability.

In the next statement "Compared to other industries, the forest industry's environmental performance is weak", respondents in Hong Kong ( $M=4.71$ ) slightly agree with the statement whereas people in Finland ( $M=3.2$ ) disagree. Results are statistically significant with P-value is  $<0.0001$ . Lower mean score in Finland is reasonable since respondents in Finland agreed more with the last statement and show stronger believes in forestry industry's effort in improving its sustainability than people in Hong Kong. That may explain why respondents in Finland disagree with the statement that the forest industry's environmental performance is weak. On the other hand, respondents with agriculture and forestry major disagree the statement the most ( $M=2.25$ ) among all majors. Only people with humanities education background slightly agree with the statement ( $M=4.44$ ), mean values of the other majors are lower than 4, towards the negative spectrum.

Statement questions asked were not only environment-related, but also about social corporate responsibility impression of the forest industry. According to the mean values from One-way ANOVA, there is no strong opinion from the groups. Apart from country of response ( $Pr>F=0.0018$ ), study major ( $Pr>F=0.01$ ) and age ( $Pr>F=0.039$ ) are found to have statistically significant differences to the statement of "Forest industry has a weak reputation for social issues". Respondents in Hong Kong ( $M=4.8$ ) somewhat agree a little more with the statement "Forest industry has a weak reputation for social issues" than those in Finland ( $M=4.02$ ). Respondents in Finland show rather neutral opinion to the statement. In the group of study major, respondents from humanities ( $M=4.81$ ) and social sciences ( $M=4.51$ ) education background showed higher degree

of agree with weak reputation for social issues in forest industry than natural sciences (M=3.82) and agriculture and forestry (M=3.75). People with natural sciences and agriculture and forestry study major slightly disagree with the statement. Age group is another group that is found to have significant differences. By checking the standard deviation values, from 1.17 to 2.12, it shows unanimous opinion between different age group.

Next, a statement regarding to similar CSR aspect, social sustainability of forest industry, "The actions of forest industry decrease the quality of life of local people" has similar results. Country of response and age also are found to have statistically significant results of statement. In which, country of response ( $Pr>F= <.0001$ ) has stronger statistical significant for the statement than age ( $Pr>F= 0.03$ ). Respondents in Hong Kong agree with the statement (M=4.7) and people in Finland slightly disagreed with the statement (M=3.75). Consumers hold opposite views according to the country. Besides, respondents with natural sciences and agriculture and forestry education disagree to the statement like the previous, yet, the result is not statistical significant.

Regarding to forest-based products, statistically significant results ( $Pr>F=0.027$ ) show men (M=4.76) agreed somehow more with "The forest-based products are in general sustainable, since wood is renewable material" than women (M=4.1). Furthermore, respondents from Hong Kong agree that "Forest based products are carbon neutral" (M=4.3) whereas respondents in Finland have slightly opposite view on it (M=3.74) ( $Pr>F=0.018$ ).

Respondents of all groups generally agree to "Activities of forest industry has negative impact on forest biodiversity", only country of response has statistically significant result among all groups. Consumers from both countries agree to the statement. It is noteworthy consumers in Hong Kong agree to this statement the most in the whole section. Mean value of Hong Kong is 5.5 whereas the value of Finland is 4.77. Respondents in Hong Kong have higher believes in the industry has negative impact on forest biodiversity than those in Finland.

When asking about the use of resource of forest industry, respondents in Hong Kong agree on both statements “The resource efficiency of the forest industry is low” (M=4.6) and “The energy efficiency of the forest industry is low” (M=4.6). Respondents in Finland hold different view on the issues. Mean values show that they disagree with the statements, with mean values 3.66 and 3.69 accordingly. These differences are statistically significant of both statements ( $Pr>F= <0.0001$ ).

Table 6: One-way ANOVA Section 6 Q33

Please answer these questions based on the knowledge, belief, or image that you have of forest industry. (1=strongly disagree, 7=strongly agree)

		Country		Gender		Major				Age					
		HK	FI	M	F	H	NS	SS	AF	<20	21-25	26-30	31-35	36-40	41-45
Compared to other natural resource based industries, the forest industry has invested a lot to improve its sustainability	M	4.37	5.07	4.69	4.95	4.25	4.73	4.73	6.33	4.44	4.74	5.08	5.2	3	6
	SD	1.16	1.32	1.40	1.23	1.29	1.30	1.17	1.15	0.88	1.25	1.5	1.14	1.41	
	P	<b>0.0015</b>		0.40			<b>0.0001</b>					0.15			
	F	10.51		0.92			7.48					1.64			
	N	149		149			149					149			
Compared to other industries, the forest industry's environmental performance is weak	M	4.71	3.20	3.79	3.66	4.44	3.49	3.92	2.25	4.56	3.88	3.27	3.2	4.5	3
	SD	1.42	1.29	1.60	1.46	1.55	1.47	1.36	1.66	1.13	1.60	1.37	1.23	0.71	
	P	<b>&lt;.0001</b>		0.86			<b>0.0005</b>					0.86			
	F	43.64		0.15			6.32					0.15			
	N	149		149			149					149			
Forest industry has a weak reputation for social issues	M	4.75	4.02	4.47	4.11	4.81	3.82	4.51	3.75	4.89	4.41	3.86	3.6	5.5	6
	SD	1.27	1.37	1.49	1.26	1.17	1.42	1.31	1.42	1.17	1.30	1.46	1.35	2.12	
	P	<b>0.0018</b>		0.28			<b>0.01</b>					<b>0.04</b>			
	F	10.12		1.27			3.90					2.42			
	N	149		149			149					149			
In general, forest industry does not violate labour rights in developing countries	M	3.88	3.76	3.75	3.85	3.69	3.91	3.67	4.00	4	3.98	3.30	4.1	2.5	5
	SD	1.18	1.47	1.53	1.24	1.14	1.40	1.37	1.48	1.00	1.23	1.60	1.60	2.12	
	P	0.61		0.90			0.74					0.08			
	F	0.26		0.11			0.42					2			
	N	149		149			149					149			

The actions of forest industry decrease the quality of life of local people	M	4.69	3.76	3.84	4.30	4.38	3.95	4.15	3.50	4.67	4.24	3.86	3.67	2.5	1
	SD	1.11	1.43	1.55	1.22	1.09	1.43	1.43	1.24	1.12	1.34	1.38	1.58	2.12	
	P	<b>&lt;.0001</b>		0.13		0.34		<b>0.03</b>							
	F	16.72		2.07		1.12		2.48							
	N	147		147		147		147							
The forest based products are in general sustainable, since wood is renewable material	M	4.21	4.51	4.76	4.10	4.00	4.56	4.32	4.67	3.78	4.39	4.49	5.00	3	5
	SD	1.50	1.52	1.48	1.50	1.32	1.47	1.47	2.19	1.64	1.51	1.59	1.05	1.41	
	P	0.26		<b>0.027</b>		0.54		0.41							
	F	1.27		3.7		0.72		1.02							
	N	149		149		149		149							
Activities of forest industry has negative impact on forest biodiversity	M	5.53	4.77	4.94	5.13	5.38	4.98	5.10	4.42	5.78	5.01	4.97	4.60	5.5	6
	SD	1.08	1.50	1.58	1.26	1.26	1.70	1.18	1.78	0.97	1.38	1.54	1.51	2.12	
	P	<b>0.0017</b>		0.56		0.34		0.52							
	F	10.2		0.58		1.14		0.84							
	N	148		148		148		148							
The resource efficiency of the forest industry is low	M	4.57	3.66	3.98	3.96	3.93	3.77	4.21	3.08	4.56	3.99	3.81	4	4.5	2
	SD	1.20	1.27	1.50	1.16	0.88	1.27	0.30	1.68	0.88	1.37	1.35	1.05	0.71	
	P	<b>&lt;.0001</b>		0.99		<b>0.0315</b>		0.43							
	F	17.78		0.01*		3.03		0.98							
	N	147		147		147		147							
The energy efficiency of the forest industry is low	M	4.63	3.69	3.96	4.08	4.19	3.91	4.19	3.08	5	4.04	3.76	3.9	5	2
	SD	1.22	1.28	1.53	1.16	1.17	1.41	1.27	1.51	1	1.35	1.34	0.99	1.41	
	P	<b>&lt;.0001</b>		0.87		<b>0.05</b>		0.08							
	F	19.05		0.15		2.6		2.03							
	N	149		149		149		149							
The way the forest industry is using water resources is unsustainable	M	4.23	4.15	4.07	4.28	3.94	3.96	4.40	4.25	4.33	4.18	3.97	4.6	5.5	4
	SD	1.25	1.18	1.43	0.97	1.24	1.54	0.92	1.14	1.22	1.23	1.17	0.70	2.12	
	P	0.71		0.59		0.20		0.43							
	F	0.14		0.53		1.56		0.99							
	N	149		149		149		149							

	M	4.67	4.29	4.40	4.45	4.75	4.16	4.48	4.50	4.78	4.46	4.3	4.2	5.5	3
Forest industry emissions decreases the quality of air	SD	1.17	1.27	1.41	1.10	1.00	1.52	1.06	1.45	0.97	1.28	1.22	1.03	2.12	
	P	0.07		0.91			0.34					0.51			
	F	3.29		0.09			1.12					0.86			
	N	149		149			149					149			
		M	4.29	3.74	4.06	3.83	4.00	4.04	3.78	4.08	4.11	3.96	3.7	3.9	5
Forest based products are carbon neutral	SD	1.23	1.39	1.60	1.11	1.41	1.52	1.19	1.62	1.36	1.30	1.37	1.60	1.41	
	P	0.018		0.58			0.72					0.18			
	F	5.68		0.55			0.45					1.55			
	N	149		149			149					149			
		M	4.46	3.06	3.60	3.50	4.31	3.78	3.51	1.83	5.11	3.78	2.62	3.1	4.5
Wood from tropical plantation is more sustainable than wood from boreal forest	SD	1.21	1.61	1.70	1.58	1.30	1.76	1.52	1.19	0.93	1.43	1.64	2.02	0.71	
	P	<.0001		0.90			0.0004					<.0001			
	F	30.04		0.11			6.5					6.06			
	N	149		149			149					149			
		M	4.46	3.06	3.60	3.50	4.31	3.78	3.51	1.83	5.11	3.78	2.62	3.1	4.5

Strong statistically significant differences are found between country of response ( $Pr>F= <0.0001$ ), age ( $Pr>F= <0.0001$ ) and study major ( $Pr>F=0.0004$ ) in statement “Wood from tropical plantation is more sustainable than wood from boreal forest”. Respondents in Hong Kong and Finland have opposite view to the topic. Respondents in Finland disagree to the statement ( $M=3.06$ ), yet, with the standard deviation 1.61, it seems the views in Finland are not highly unanimous. People in Hong Kong, however, somehow agree that tropical plantation wood is more sustainable than those from boreal forest ( $M=4.5$ ).

Table 7 below presents the basic statistics of question 34 in section 6. There are eight statements in the question. Statements are related to forest and wood situations in the future. In general, respondents somehow agree with the majority of the statements, but expect two of them. Either agree or disagree, judging by their mean values, respondents’ views are not strong. The range of the mean values are between 3.72 to 4.98. Respondents agree the most with forest shortage in the future ( $M=4.98$ ) and slightly disagree with wood will be used as raw material more often in the future ( $M=3.72$ ).

Table 7: Mean and SD values Section 6 Q34 (1=strongly disagree, 7=strongly agree)

Statements	Mean	SD
In the future, there will be shortage of forests.	4.98	1.51
In the future, wood will be used for making furniture more often than today.	4.04	1.45
In the future, wood will be used as construction material more often than today.	4.17	1.59
In the future, wood will be used as raw-material for clothing more often than today.	3.95	1.57
In the future, wood will be used as raw-material for medicine more often than today.	4.22	1.45
In the future, wood will be used as raw-material for food more often than today.	3.72	1.48
In the future, wood will be used as a substitute for many currently oil based products, such as plastic.	4.53	1.63
In the future, recreational use for forests will be greater than today.	4.63	1.29

Table 18 (appendix 2) and Table 8 display the SAS outputs and results from One-way ANOVA of all statements in question 34. It is noticeable that statistical significant results appear in study major the most across all groups. On the other hand, gender does not have any statistical significant differences in all statements. Two statements do not have statistically significant results in them as well. They are “Wood will be used for making furniture more often than today” and “Recreational use for forests will be greater than today”. Hong Kong people agree more ( $M=5.77$ ) with the statement “In the future, there will be shortage of forests” than those in Finland ( $M=4.56$ ) ( $Pr>F= <0.0001$ ). Statistically significant results can be found in age group ( $Pr>F=0.030$ ) and study major ( $Pr>F=0.021$ ) as well. In study major, only respondents from agriculture and forestry education somehow disagree the statement. They do not think there will be shortage of forest in the future.

Several statements regarding the future use of wood as raw materials for construction, clothing, medicine and food were included in the question. Strong statistically significant results can be found in these statements. Respondents with agriculture and forestry education ( $M=5.92$ ) agree much more that wood will be use as construction material more often in the future than other study majors. Further, this statement result is associated with strong statistical significant ( $Pr>F= <0.0001$ ).

Respondents in Hong Kong somehow disagree ( $M=3.52$ ) with wood as raw material for clothing in the future, yet, people in Finland slightly agree ( $M=4.17$ ) ( $Pr>F= 0.01$ ). In study major, all other study majors except respondents with agriculture and forestry education disagree with the statement, meaning that they do not think wood will be use more often than today as raw material for clothing in the future. Respondents from agriculture and forestry study major agree with the statement in somehow a higer degree manner ( $M=5.83$ ) ( $Pr>F= <0.0001$ ).

Study major continuously to have statistically significant differences in the following statements. Respondents with agriculture and forestry education agree visibly higher degree than the rest of the study majors to the statement “In the future, wood will be used as raw material for medicine more often than today” ( $M=5.92$ ) ( $Pr>F= <0.0001$ )

and “In the future, wood will be used as raw material for food more often than today” (M=5.25) ( $P > F = 0.0024$ ). Other study majors, humanities, natural sciences and social sciences are rather neutral to the statements or somehow disagree with.

Regarding to wood as a substitute of oil-based products, like plastic, respondents in Hong Kong slightly disagree with that (M=3.88), yet, those in Finland somehow agree with the statement in a rather low degree (M=4.87) ( $P > F = 0.0004$ ).

Table 8: One-way ANOVA Section 6 Q34

The following questions concern the future. Please answer these questions on the knowledge that you have. (1=strongly disagree, 7=strongly agree)

In the future, ...	Country		Gender			Major				Age					
	HK	FI	M	F	H	NS	SS	AF	<20	21-25	26-30	31-35	36-40	41-45	
there will be shortage of forests.	M	5.77	4.56	4.87	5.09	5.5	4.8	5.18	3.92	5.20	5.13	4.92	3.60	6	3
	SD	1.08	1.55	1.64	1.41	1.03	1.68	1.37	1.88	1.32	1.47	1.46	1.78	0	
	P	<.0001		0.55			0.021				0.03				
	F	25.18		0.59			3.330				2.56				
	N	150		150			150				150				
wood will be used for making furniture more often than today.	M	3.94	4.09	4.06	4.03	3.63	4.15	3.9	4.75	4.2	4.07	3.65	4.8	5	5
	SD	1.45	1.45	1.43	1.48	1.54	1.49	1.38	1.36	1.32	1.43	1.6	0.92	0	
	P	0.55		0.99			0.16				0.22				
	F	0.36		0.01*			1.74				1.41				
	N	150		150			150				150				
wood will be used as construction material more often than today.	M	3.98	4.27	4.25	4.10	3.25	4.17	4.11	5.92	3.6	4.34	3.81	4.6	3.5	5
	SD	1.35	1.7	1.69	1.51	1.13	1.64	1.45	1.44	1.35	1.45	1.82	1.71	3.54	
	P	0.29		0.85			<.0001				0.36				
	F	1.11		0.16			7.65				1.11				
	N	149		149			149				149				

	M	3.52	4.17	4.13	3.79	3.31	3.72	3.95	5.83	3.1	4.01	3.78	4.7	3.5	6
wood will be used as raw-material for clothing more often than today.	SD	1.5	1.56	1.55	1.58	1.3	1.56	1.51	1.11	1.37	1.57	1.64	1.06	2.12	
	P	0.01		0.41			<.0001						0.17		
	F	6.13		0.89			7.87						1.56		
	N	150		150			150						150		
	M	4.21	4.22	4.29	4.16	3.63	4.22	4.10	5.92	4.3	4.22	4.16	4.4	3	6
wood will be used as raw-material for medicine more often than today.	SD	1.45	1.45	1.46	1.45	1.45	1.41	1.37	1.08	1.64	1.45	1.46	0.97	2.83	
	P	0.96		0.86			0.0001						0.68		
	F	0*		0.15			7.33						0.63		
	N	150		150			150						150		
	M	3.81	3.67	3.84	3.61	3.44	3.57	3.62	5.25	4	3.86	3.24	3.9	3	6
wood will be used as raw-material for food more often than today.	SD	1.39	1.54	1.54	1.45	1.41	1.49	1.46	1.14	1.41	1.41	1.59	0.37	2.83	
	P	0.60		0.64			0.0024						0.16		
	F	0.28		0.45			5.02						1.61		
	N	150		150			150						150		
	M	3.88	4.87	4.58	4.49	3.88	4.33	4.48	6.33	4	4.43	4.84	4.7	4	6
wood will be used as a substitute for many currently oil based products, such as plastic.	SD	1.49	1.61	1.70	1.59	1.63	1.66	1.53	1.15	1.25	1.61	1.8	1.42	2.83	
	P	0.0004		0.90			0.0003						0.58		
	F	13.32		0.45			6.59						0.76		
	N	150		150			150						150		
	M	4.37	4.78	4.80	4.50	4.38	4.61	4.59	5.25	4.8	4.69	4.54	4.7	3.5	3
recreational use for forests will be greater than today.	SD	1.24	1.30	1.30	1.28	1.54	1.39	1.20	1.14	0.92	1.19	1.56	1.42	2.12	
	P	0.06		0.34			0.33						0.60		
	F	3.48		1.10			1.15						0.73		
	N	150		150			150						150		

### 5.3.2 Relation between consumers and sustainability information

The following sub-chapter is about the data analysis regarding to all statement questions about sustainability information and related issues of consuming ecological products.

Table 9: Mean and SD values of Section4 Q27 (1=strongly disagree, 7=strongly agree)

Statement	Mean	SD
I search the options on the shelves to see if there are eco products when I shop.	3.52	1.75
I normally just pick up a product that I like without considering the sustainability issues.	4.60	1.58
I search for information about sustainability when I purchase a product.	2.78	1.53

Table 9 shows the basic statistic of question 25 in section four. This question contains three statements that are related to their purchasing habits with sustainability information in order to understand how they consume and search for information. It seems that consumers do not search for ecological alternatives and sustainability information of their desired product when they shop. Means values of both statements are rather low and toward the disagree spectrum.

Table 19 (appendix 2) and Table 10 show the SAS outputs and One-way ANOVA results of the statements in question 25. Results of the statement in Table 10 “I search the options on the selves to see if there are eco products when I shop”, means values from ANOVA are mostly under four except respondents from agriculture and forestry study major (M=4.50) (Pr>F=0.043). Men disagree more (M=3.04) with the statement than women (3.97) (Pr>F=0.001), meaning that men are more likely to not searching on the shelves. Men also are more likely to just pick up a product (M=4.92) that they like without thinking its sustainable issues than women (M=4.30) (Pr>F=0.027).

Table 10: One-way ANOVA of Section 4 Q25

How well the following statements describe your buying behaviour, using a scale from 1 to 7. (1 = Strongly disagree, 7 = Strongly agree)

		Country		Gender		Major			Age						
		HK	FI	M	F	H	NS	SS	AF	<20	21-25	26-30	31-35	36-40	41-45
I search the options on the shelves to see if there are eco products when I shop.	M	3.42	3.58	3.04	3.97	3.18	3.13	3.73	4.50	3.83	3.45	3.68	4.00	1.50	1.50
	SD	1.53	1.86	1.63	1.72	1.38	1.83	1.71	1.88	1.47	1.74	1.82	1.76	0.71	0.71
	P	0.57		0.001			0.043					0.22			
	F	0.33		7.41			2.790					1.42			
	N	167		167			163					163			
I normally just pick up a product that I like without considering the sustainability issues.	M	4.87	4.44	4.92	4.30	5.18	4.69	4.48	4.08	4.75	4.68	4.63	3.80	3.50	4
	SD	1.53	1.59	1.47	1.62	1.81	1.63	1.51	1.51	1.22	1.56	1.70	1.62	2.12	1.41
	P	0.09		0.027			0.25					0.52			
	F	2.98		3.7			1.39					0.84			
	N	167		167			163					163			
I search for information about sustainability when I purchase a product.	M	2.89	2.72	2.48	3.07	2.88	2.46	2.85	3.25	3.42	2.81	2.78	2.30	1	2
	SD	1.38	1.62	1.47	1.54	1.65	1.50	1.51	1.66	1.08	1.61	1.47	1.42	0	1.41
	P	0.51		0.024			0.31					0.28			
	F	0.44		3.83			1.21					1.27			
	N	167		167			163					163			

Regarding searching sustainability information, results indicate that respondents do not search sustainability information when purchasing a product. Means values of this statement are under four in all groups. In gender, both men and women disagree on searching information of sustainability of the product, yet men are even more so in purchasing a product ( $P > F = 0.024$ ).

As mentioned before, consumers are less likely to search for information on their own, however, they do read sustainability information that is presented on products or packaging. Over 80% of consumers claim that they read the eco-label and somehow take the information into account when shopping. Nonetheless, the frequency of taking the eco-label and its information into consideration is not very high. The majority of respondents use the label “Only occasionally” and “sometimes only”. There are only 5.56% (N=9) of the respondents claim to always read the label and take the information into account when they shop.

Table 11: Mean and SD values of Section 4 Q28 (1=strongly disagree, 7=strongly agree)

Statements	Mean	SD
a. I pay attention to the eco-labels if they are presented on the products.	4.58	1.56
b. When I read the additional information on packaging about ecological/sustainable impact, I found that labels are more helpful than words.	4.85	1.39
c. I don't trust the reliability of eco-labels and sustainability information on products.	3.75	1.44

Table 11 presents the basic statistics of question 25, only the first three statements are included in this thesis. There are three statements in this question regarding how consumers use the available sustainability information when they shop. Standard deviation

range is from 1.39 to 1.56, respondents are quite unanimous in the view of the above statements. In general, respondents agree that they pay attention to eco-labels if they are presented on the products. They also agree that labels are more helpful than words when reading additional information regarding to ecological or sustainable impact. In terms of credibility of sustainability information, respondents are quite neutral to it. They do not have strong opinion to whether they trust or do not trust eco-labels.

Table 20 (appendix 2) and 12 show all SAS outputs and the results of One-way ANOVA of the first three statements in question 28. Women ( $M=4.89$ ) agree stronger than man in paying attention to the on-product eco-labels when they shop ( $M=4.27$ ) ( $Pr>F=0.003$ ), meaning women maybe more likely to pay attention to the labels on products. Both men ( $M=4.72$ ) and women ( $M=5$ ) agree that labels are more helpful than word when reading additional sustainability information on the package ( $Pr>F=0.008$ ). Women are slightly more agree with the statement than men.

Respondents from different study majors seem to have quite same view on the reliability of sustainability information. They are in general agree with the statement which mean values are under four. In which, respondents with agriculture background ( $M=3$ ) ( $Pr>F=0.045$ ) trust sustainability information the most among all study majors.

There are no statistically significant results in country of responses in all three statements, perhaps nationalities and culture do not have significant impact on their behaviour in searching sustainable information.

Table 12: One-way ANOVA of Section 4 Q28

How well the following statements describe your buying behaviour, scale them from 1 to 7. (1 = Strongly disagree, 7 = Strongly agree)

		Country		Gender			Age					Major			
		HK	FI	M	F	<20	21-25	26-30	31-35	36-40	41-45	H	NS	SS	AF
I pay attention to the eco-labels if they are presented on the products.	M	4.53	4.60	4.27	4.89	4.45	4.52	4.78	5.3	2	2	4.18	1.31	4.76	5.26
	SD	1.43	1.64	1.64	1.4	1.44	1.54	1.66	0.95	0		1.55	1.74	1.43	1.54
	P	0.79		0.003				0.046						0.12	
	F	0.07		6.15				2.32						1.99	
	N	163		163				163						160	
When I read the additional information on packaging about ecological/sustainable impact, I found that labels are more helpful than words.	M	5.02	4.75	4.72	5	4.82	4.88	4.75	5.1	4.5	4	4.88	4.73	4.82	5.5
	SD	1.41	1.37	1.42	1.29	1.6	1.39	1.46	0.99	0.71		1.5	1.5	1.3	1.45
	P	0.23		0.008				0.96						0.39	
	F	1.43		4.93				0.21						1.01	
	N	163		163				163						160	
I don't trust the reliability of eco-labels and sustainability information on products.	M	3.68	3.80	3.83	3.69	3.91	3.8	3.55	3.8	4	5	3.18	3.77	3.99	3
	SD	1.27	1.54	1.54	1.37	1.04	1.34	1.66	1.81	2.83		1.38	1.49	1.43	1.21
	P	0.63		0.82				0.87						0.045	
	F	0.23		0.19				3.75						2.74	
	N	163		163				163						160	

When consumers go to shop, in searching for their products and reading the information, there is chance that they encounter unknown or unfamiliar information. Question about searching unknown information was asked in the survey. Table 13 below show the frequency of all options of respondents. Multiple options were allowed to choose in this question in order to find out possible searching channels.

Table 13: Frequency of search channels in Section 5 Q29

Channels of searching unknown eco-labels	Frequency
the website provided on the package	33
I ask friends and family	39
Internet searching engine	83
QR Code if available	15
I don't know where to search for information	12
I don't search for information	78

The most frequent option is “Internet searching engine” (83), Google for instance. It is note-worthy that the second most frequent option is “I don’t search for information” (78), consumers tend to just ignore the unknown information without looking for more description through another channel. It is suggesting that easy-to-understand information is essential if the industry or company wants to provide information about product sustainability.

Even though company often provide its website on package, respondents seem not using it as a source of information, judging by its low frequency (33). The amount consumers that do not know where to find information is low (12). Although they know the channels, to use them for searching additional information is doubted and not very common.

Table 14 below shows the basic statistics of question 30 in section five regarding to eco-labels formulations. Suggesting by the standard deviation values from “Label only” (SD=1.11) and “Label with scales and a brief verbal explanation” (SD=0.98), respondents’ views are somehow similar.

Table 14: Mean and SD values of Section 5 Q30 (1=Very useful 5=Not at all useful)

Formulations of eco-labels	Mean	SD
Label only	2.62	1.11
Label with scales and a brief verbal explanation	1.97	0.98
Pure text in label presentation	2.90	1.33

In this questions, coding was done differently comparing with the rest of other Likert-scale questions. Likert-scale is in five-points scale. The lower the scale number the more recognition of the statement. As a result, respondents think that the particular label formulation is helpful in general. Even though the coding was done differently, analysis results are not affected by it.

Respondents somehow agree that all labels are helpful. In all label formulations, “Label with scales and a brief verbal explanation” (M=1.97) seems to be the most helpful format of all. Even though “pure text” (M=2.90) and “label only” (M=2.62) are two absolute different formulations, results are interestingly similar. Respondents tend to even think that Label only is slightly more helpful than just pure text, judging by the smaller mean value of it.

Table 15: One-way ANOVA of Section 5 Q30

How useful are the different formulations of ecolabels? (1=Very useful, 5= Not at all useful)

		Country		Gender	
		HK	FI	M	F
Label only	M	2.90	2.46	2.79	2.48
	SD	1.10	1.09	1.15	1.07
	P	0.014		0.191	

	F	6.23		1.67	
	N	163		163	
			1.9		
	M	2.03	3	1.75	2.17
			1.0		
Label with scales and a brief verbal explanation	SD	0.84	6	0.81	1.08
	P	0.528		0.013	
	F	0.4		4.44	
	N	163		163	
	M	2.82	2.95	3.04	2.76
	SD	1.30	1.35	1.40	1.25
Pure text in label presentation	P	0.534		0.116	
	F	0.39		2.19	
	N	163		163	

To have a closer look on different groups, Table 21 (appendix 2) and Table 15 present the SAS outputs and all One-way ANOVA results of all labels formulations. Country of response and gender yield significant differences in two label formulations. For “label only”, respondents in Finland agree stronger (M=2.46) with the formulation than people in Hong Kong (M=2.90) ( $Pr>F=0.014$ ). In a five points Likert scale, mean value of Hong Kong (2.90) is fairly closed to the neutral, which is 3. It shows the opinion of Hong Kong consumers about “label only” formulation is between slightly agree to neutral.

For “label with scales and a brief of explanation”, men (M=1.75) agree more with the option than women (M=2.17) ( $Pr>F=0.013$ ). “Pure text” formulation does not have any statistically differences in both groups.

## **6. CONCLUSION AND DISCUSSION**

In this chapter, the results of the research are concluded, summarised and discussed using initial research questions which were presented in the earlier chapters. Moreover, the reliability and the validity of the study are discussed in the following sub-chapter, as well as suggestion for future research or improvement.

### **6.1. Key findings**

This sub-chapter is about the findings of this research. Not all results are presented, only key findings are pointed out with comparison with previous studies whether they contradicted or matched with this research. This section is divided according to the two main research questions; consumers' current understanding and future expectation of sustainability in the forest industry as well as the relation between consumers and sustainability information.

#### **6.1.1 Consumers' current understanding of sustainability in forestry business and future expectation**

Firstly, consumers' impression of forest industry seems positive. They think that forest industry is sustainable in general, yet, they also agree that it should be improved. The positive attitude towards sustainability of the industry may come with the nature of forest-based products, i.e. wood is renewable material. In this case, men have more positive believe than women. Nonetheless, the differences are not obvious enough to make judgement that women are more critical in sustainability of forest industry than men. As the sample population is dominated by students, this supports research of Panwar et al. (2010b) that there are no differences between gender in students.

In terms of sustainability performance of forest industry, consumers think the industry has invested a lot to improve its sustainability and the industry's environmental performance is not weak. However, consumers do think that activities of forest industry have

negative impact on forest biodiversity as well as its emissions decreases the quality of air.

Other than environmental CSR, consumers have opinion on social CSR as well. They agree that the industry has a weak reputation for social issues. For instance, consumers do not agree that the industry does not violate labour rights in developing countries. When it comes to the actions of forest industry decrease local people's quality of life, consumers' view is rather neutral. They agree that forest industry has a big impact in improving global sustainability. Consumers do not agree that wood from tropical plantation is more sustainable than those from boreal forest. It seems people see wood as one, there are no differences between the sustainability between different types of wood.

In connection with sustainability improvement for the forest industry, consumers' opinion on environmental and social CSR issues provide insights for the industry. The forest industry should consider to improve its CSR performance by working on those issues. In general, country of response is found to have more significant results than other groups. Consumers in Hong Kong seems more critical and negative to the forest industry sustainability whereas people in Finland have more positive impression to the industry. Several sustainability statements, such as regarding to environmental performance, reputation of social issues and the impact of forest industry activities, data shows that people in Hong Kong are not as positive as consumers in Finland.

Panwar et al. (2010b) suggested ecology/environmental science students are the least satisfied with social and environmental responsibility of the forest industry which contradicted with the results of this research. Students with agriculture and forestry education in fact satisfied the most in forest industry sustainability performance.

In terms of the use of resources, consumers do not have a strong view on such topics. Consumers are rather neutral about resource efficiency and energy efficiency of forest industry. Though, the use of water resources may be unsustainable in consumers' point

of view. From the responses collected, consumers seem not to have very strong opinion on forestry sustainability issues, perhaps like Thompson et al. (2009) mentioned, consumers are not aware and understand the value of green consumerism in the forest industry. Therefore, they do not have much knowledge and awareness of how the industry operates and its sustainability issues.

One of the research purpose is to find out consumers' expectation of forestry sustainability. Consumers believe that sustainably managed forest is the future of forest industry. The use of wood will be more diversified than today. Consumers think that wood will be used as a substitute for oiled based products (e.g. plastic), as raw material for medicine and construction material more often in the future. However, they are rather neutral to wood as raw material for furniture manufacturing and clothing in the future. In terms of wood as raw material, they also do not think that wood will be used as raw material for food more often than today. Then, consumers believe that recreational use for forests will be grater in the future. All the above mentioned is suggesting that consumers may not have clear opinions concerning those sustainability issues in the forest industry.

Perhaps based on the more diversified use of wood, people think that there will be shortage of forests in the future. Maybe it is as well the reason that consumers agree sustainably managed forest is the future of forestry industry.

In the view of consumers' future expectation of forest industry, people in Hong Kong have stronger believe that there will be forest shortage in the future than people in Finland. Regarding wood as will be a substitute for oil-based products (e.g. plastic), consumers from Hong Kong and Finland hold different view. People in Finland somehow think that wood will be used as a substitute whereas consumers in Hong Kong do not think so. In the group of study major, statistically significant results can be found in the majority of statements in this future section, suggesting culture may affect how consumers foresee the forest industry in the future.

### **6.1.2 Relation between consumers and sustainability information**

Consumers do not search sustainability information about a product that they plan to purchase, they tend to just pick up the product that they like without considering its sustainability issues. When they are searching products on shelves, they do not look for ecological products as well. In this circumstance, men are more just pick up whatever they like than women.

Solomon et al., (2009, 270) indicated that women are more inclined to search for information than men are which it matches the results for sustainability information searching. Women are indeed more positive than men in searching sustainability information of products, although searching sustainability information is not very common when consumers shop. Just as Beatty & Smith (1987) and Lynch & Ariely (2000) mentioned, consumers minimise their time and effort to search information. The frequency and amount of external search effort is often limited (Beatty & Smith, 1987; Solomon et al., 2009, pp. 267).

Just consumers do not actively search for sustainability information does not mean that they do not care at all. Previous research indicated the majority of consumers claimed to always read eco-labels (D'Souza et al., 2006). However, only a very small amount of consumers claimed they always read them and consider its information in purchasing decision in this research. Even though they do not always take it into account when making decision, consumers do pay attention of eco-labels if they are shown on products. Especially women are found to be more so than men. When there is an eco-label that telling the sustainability information of a product, over 80% of consumers claim to read it and take its information into account in decision making, just not as frequent. Teisl et al. (2004) indicated that consumers feel hesitate to trust sustainability information and its claims. In this research, regarding to the credibility of eco-labels, consumers are rather neutral in trusting the sustainability information they read. This somehow contradicted to previous study from Teisl et al. (2004) that consumers are hesitated to trust sustainability information. In addition, consumers prefer label instead of words

in delivering on-packaging ecological information. Label is more helpful than words in consumers' point of view.

All in all, the use of sustainability information is quite uncertain. Consumers read and sometimes take that information into account when they shop, but they tend to not put extra effort to search and look for unknown information. As Grunert et al. (2014) suggested, consumers have strong concern on sustainability however, the sustainability information usage is unclear. This phenomenon affects the effectiveness of sustainability information; uncertain use of such information may lead to communication failure. The information provided could not finally drive to sustainable consumption.

There are a few more common label formulations can be found currently in the market; label, label with scales and a brief verbal explanation and pure text. Consumers seem to like label with scales the most and they agree that it is the most helpful of all which matched what Grankvist et al. (2004) suggested. Label with scale and a bit explanation like EU energy label was suggested by Grankivist et al. (2004) to be the most effective label formulation and presentation to consumers. Statistically significant results show that men prefer such label formulation as the most helpful much more than women. Label with scale and explanation is found to be helpful, perhaps it provides value-differentiated information that helps products stand out from their alternatives on shelves as Meise et al. (2014) suggested. It is interesting that even though consumers stated previously label is more helpful than words but results show differently. Pure text in label presentation ranked higher than label only, meaning that consumers prefer pure text than label with a logo only. Statistically significant results also show that people in Finland prefer "label only" more than those in Hong Kong.

## **6.2 Discussion**

What is the actual understanding and consumers' view of sustainability in the forest industry today and in the future?

Consumers basically do care of sustainability in the forest industry even though its sustainability is seen generally quite sustainable. As their responses shown, they worry that there will be forest shortage in the future. It shows they have concern in preserving forest resources in order to ease the possible shortage in the future. However, in terms of deeper knowledge of how forest businesses operate and further knowledge of their sustainability of the actual activities, consumers seem to be not very knowledgeable. They do not have strong opinion in the efficiency of resources. It may perhaps relate to their lack of knowledge in certain fields and aspects. Consumers think that the use of wood as a raw material will be more diversified in the future.

Culture differences can be found between Finland and Hong Kong in viewing sustainability in the forest industry. Consumers in Hong Kong are more sceptical in forestry sustainability. They view sustainability in forest industry in the future more negatively than people in Finland. Some sustainability issues are seen as negative yet people in Finland hold opposite opinion. For instance, consumers in Hong Kong think the forest industry environmental performance is weak and actions of the industry ruin the quality of life of the locals. These issues are disagreed by people in Finland. It shows that the forest industry somehow is seen in more negative way in Hong Kong than in Finland. The understanding of forest businesses and their operation may differ in these countries.

Since forest-related industry such as pulp and paper industry takes a rather big part in Finnish economy when comparing to the situation in Hong Kong. It is possible that people in Finland are more aware of what the industry is actually doing than people in Hong Kong. Therefore, consumers hold different views in country of response. More studies that compare consumers' perception of forestry business will be helpful in understanding the topic.

However, it is interesting to see how consumers in Hong Kong do not see the future improvement of forestry sustainability more important than consumers in Finland. One

may expect this should be agreed strongly in Hong Kong because of the sceptical attitude towards sustainability in the industry, it seems not the case. Overall, the role of forest industry is seen as important in improving global sustainability.

As mentioned in the key findings, there are no significant differences between genders in how they view the importance of various sustainability issues to be for forest industry. It is interesting to see men are more just pick up whatever they like and do not search for ecological alternatives on shelves as well as sustainability information of the product than women. This being said, there are no significant differences between gender in viewing the importance of sustainability issues but somehow purchasing behaviour of consumers differ in gender. Perhaps further researches on the subject help find out what cause the change in consumer behaviour in sustainable consumption.

If relevant businesses from the forest industry want to impress consumers from their sustainability performance, these are the aspects that effort can be put and focused. In addition, these are the fields that the industry has room to improve in the view of consumers.

How do consumers see sustainability information?

In general, consumers do not search for information of the sustainability of products, no matter they are in Finland or Hong Kong. There are no significant differences across all groups too. When consumers encounter information that they do not understand, they go for Internet searching engine to look for it. It is note-worthy to mention that “I don’t search for information” is the second most likely action to do when they do not understand the information.

Therefore, it is important to present easy-to-understand and comprehensive sustainability information on products in order to deliver the exact message manufacturers would like to tell consumers because chances of consumers to search from other channels (e.g. company website or QR code) is low.

Furthermore, consumers just sometimes or occasionally take sustainability information into account when they shop. Their concern of sustainability seems do not reflect onto their behaviour. The reasons behind the failure in terms of making consumers make

decision with such information could be useful for relevant industry. It can be because of the information content is not attractive and persuasive or it fails to draw attention. Even though consumers do not always take sustainability information into consideration in decision making, it is not because of the credibility. Consumers do not think eco-labels and sustainability information are not trustable.

As previous studies stated, multi-dimensional information (Teisl et al., 2001; Young et al., 2010) and standardised certifying system (Hoek et al, 2013) should be developed and introduced to the market, so that it increases the convincingness of sustainability information. It may connect the sustainability awareness and the use of the information to actual sustainable consumption.

In terms of label formulation, label with scales and short explanation in words is the most appropriate format for consumers. It actually is a good format that provide multi-dimensional information. This type of label can possibly be adapted to different kinds of products to be a standardised system like previously mentioned. Government, NGOs and labels certifiers should work on introducing labels like the EU energy label for different products in the market.

To conclude the discussion, the future consumers seem to think sustainability issues are important today and in the future in the forest industry, socially and environmentally. Unfortunately, the awareness of sustainable development from consumers does not reflect to their buying behaviour. They do not particularly concern in search ecological alternatives and relevant sustainability information. Consumers generally consider the forest industry and its products are sustainable but there is certainly room for improvement in the forest industry. It is essential for the industry to find a way to link the awareness of sustainability to actual decision making. Sustainability information should be easily comprehensive and multi-dimension so that consumers can receive different information that is persuasive as consumers usually do not search for sustainability information. Perhaps it leads to more sustainable consumption in the future. The choice of label formulation should assist such information delivers to consumers. Internet searching engine is still the most common channel for searching unknown sustainability

information if needed, therefore, it may not be necessary to develop new searching channels for now.

### **6.3 Reliability and validity of the study and future research suggestions**

This study is reliable. Anyone would like to use the results or duplicate the study could use the same research survey that was used in this research to collect data.

However, there are some limitations and constrains in conducting the research with a survey and it may eventually somehow affect the reliability of the study. In the survey, there are questions that related to information searching habit and consumer behaviour. Constrains appear because of two reasons.

First of all, consumers may not answer the questions honestly as they do not want to be judged base on their answers are not socially acceptable. It may fail to predict and measure their true behaviour. Secondly, as mentioned in the earlier, some questions in the survey require knowledge of sustainability or certain know-how to evaluate specific issue. For instance, energy efficiency of the forest industry. Therefore, there is possibility that the survey does not help reveal the truth of consumer behaviour objectively. Research results aim in describing the values, expectation and perceptions of consumers in forestry sustainability and their behaviour in information search. Though, the honesty of survey participants still determines the reliability of research results.

In addition, the language of the survey was not translated to both countries' official languages. Only survey that distributed in Hong Kong was translated by professional translation to Traditional Chinese to minimise misunderstanding and maximise the response rate. Translation was checked and approved before sending out to the public. The survey that was available in Finland is in English, so it is possible that respondents misunderstood the questions. However, no complaints on language and about not being able to understand the questions were received from respondents in Finland. Therefore, language barrier was not a problem in Finland. To avoid misunderstanding because of terminology, some terms were explained in the survey to ensure the survey was comprehensive enough for the respondents.

It is worth mentioning that a few respondents commented to the survey content. Questions of forest industry were pointed out to be too general as the forest sector is quite different between countries. The concepts of the forest industry may differ between Finland and Hong Kong; the possibility of misunderstanding may happen. It can decrease the reliability of the research. Also, there is comment regarding concepts elaboration and terms explanation. Respondents suggested more examples should be given and that would be helpful. Furthermore, pre-test was conducted only in Finland. As the survey was distributed in two different countries that are very different, pre-testing the survey in Finland was not perfect in consideration of cultural differences. Nonetheless, comments about the survey content was very few, the reliability of the research is still good.

Regarding to the validity of the study, this research is valid in terms of research method and sampling. Using quantitative research method is definitely appropriate in data collection of this study as the goal of the research is to have an overview of consumer behaviour. As mentioned in previous chapter, student is a common sample in research, it is valid to use university students as research sample.

Moreover, students are suitable for one of the research purpose, i.e. the future expectation of sustainability. Students are usually young people who are developing their personal values and beliefs as well as forming own identity (Yazdanpanah & Forouzani, 2015). Therefore, students are representing future consumers. Instead of choosing single group of students, a diverse background population was chosen. Students participated in data collection are from different fields and study majors. They represented different background in order to increase the generalisability of the study.

Data was collected in Finland and Hong Kong only, yet the population was not only these two nationalities. As the environment in university is international, there are respondents that are from different countries than just Finland and Hong Kong. It would have been better in comparing results if the analysis had focused merely on two nationalities and had omitted the others. In this way, the comparison of consumers' opinion would be more generalised.

Speaking of survey sample, the response rate of the survey was rather low. The amount of responses was originally expected to be 100 from each country, however, response rate in Hong Kong is apparently not fulfilling the goal. The poor response rate in Hong Kong can be due to the lack of official access to university students. Without official channel, such as assistance from student service or connection with the faculty staff, it is not easy to reach out a big amount of students. A larger sample size in future studies should be beneficial to improve generalisability of future researches. Better survey distribution should be planned and perhaps by using more professional channel, cooperating with universities or city government will increase the response rate. Therefore, researchers can receive more generalizable results from a larger sample size.

In regards to the data analysis, post-hoc tests were not done. Therefore, it limits the interpretation of the research results. Post-hoc tests should be done in the future in order to understanding more from the data and have a better interpretation of it. More relations might be revealed in terms of consumer behaviour in sustainability information and sustainability expectation of the forest industry.

All in all, this research has only revealed very little bit of consumers' perception of sustainability and sustainability information. In order to understand more and try to have more representative results in understanding consumers, further study with larger sample size is much needed. A more well-planned and representative research of this field would absolutely benefit many parties, the industry, policy maker and marketers to improve sustainable consumption and the awareness of

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# APPENDICES

## APPENDIX 1: THE QUESTIONNAIRE

### Section 1: Background questions

1. Age:

Below 20	36-40
21-25	41-45
26-30	Above 45
31-35	

2. Nationality:

3. Gender: F/M

4. Field of study:

Art	Humanities
Mathematics and natural sciences	Law
Social Sciences	Education
Medicine	Engineering
Information Technology	Agriculture and Forestry
Economic and Business	Others: _____

5. Monthly income (net):

0-499	500-999	1000-1499	1500-1999	2000+
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6. Monthly spending:

0-399	400-799	800-1199	1200-1599	1600+
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7. I am:

A part time student	A fulltime student	Not a student
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8. Are you working?

No	Yes, part time	Yes, fulltime
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9. Describe briefly your working experience (e.g., how many years, what kind of job, sector etc.)  
: \_\_\_\_\_

10. Do you have children?

Yes

No

11. Please assess the importance of the following values as a life-guiding principle for you. (1= against my principles to 7= of supreme importance)

a) **Power** (social power, authority, wealth)

b) **Achievement** (success, capability, ambition, influence on people and events)

c) **Hedonism** (gratification of desires, enjoyment in life, self-indulgence)

d) **Stimulation** (daring, a varied and challenging life, an exciting life)

e) **Self-Direction** (creativity, freedom, curiosity, independence, choosing one's own goals)

f) **Universalism** (broad-mindedness, beauty of nature and arts, social justice, a world at peace, equality, wisdom, unity with nature, environmental protection)

g) **Benevolence** (helpfulness, honesty, forgiveness, loyalty, responsibility)

h) **Tradition** (respect for tradition, humbleness, accepting one's portion in life, devotion, modesty)

i) **Conformity** (obedience, honouring parents and elders, self-discipline, politeness)

j) **Security** (national security, family security, social order, cleanliness, reciprocation of favours)

12. Please rate the following statements on a scale from 1 (=strongly disagree) to 5 (=strongly agree):

1. My first impressions of people usually turn out to be right.

2. It would be hard for me to break any of my bad habits.

3. I have not always been honest with myself.

4. I always know why I like things.

5. Once I've made up my mind, other people can seldom change my opinion.

6. It's hard for me to shut off a disturbing thought.

7. I never regret my decisions.

8. I rarely appreciate criticism.

9. I am very confident of my judgments.

10. I don't always know the reasons why I do the things I do.

11. I sometimes tell lies if I have to.

12. I never cover up my mistakes.

13. I always obey laws, even if I am unlikely to get caught.

14. I have said something bad about a friend behind his or her back.

15. When I hear people talking privately, I avoid listening.

16. I have received too much change from a salesperson without telling him or her.

17. When I was young I sometimes stole things.

18. I have done things that I don't tell other people about.

19. I never take things that don't belong to me.

20. I don't gossip about other people's business.

## Section 2: General consumer behaviour

13. How often do you shop groceries?

- a. daily
- b. several times a week
- c. once a week
- d. couple times a month
- e. less often

14. How often do you shop for other things?

- a. daily
- b. several times a week
- c. once a week
- d. couple times a month
- e. less often

15. How well do the following statements describe your buying behavior, using a scale from 1 to 7. (1=Strongly disagree, 7=Strongly agree)

- a. I only buy what I need.
- b. I prefer ecological products.
- c. I try to avoid spending money.
- d. Shopping is a way to pass time for me.
- e. I am an impulsive shopper.
- f. I mostly shop online.
- g. I like buying things for my family and friends

16. Please use a few words to finish the sentence below.

I generally avoid buying products that \_\_\_\_\_.

I usually prefer buying products that \_\_\_\_\_.

17. Please indicate the degree to which you think the following aspects of a product are important. Rate each of the aspects from 1 to 7. (1= not important at all, 7= very important)

**Grocery products:**

- a. packaging
- b. price
- c. quality

- d. style
- e. how ecological the product is
- f. place of production
- g. practicality
- h. some other aspect, please name:

**Paper products** (copy paper, envelopes, notebooks and calendars, household paper etc.):

- a. packaging
- b. price
- c. quality
- d. style
- e. how ecological the product is
- f. place of production
- g. practicality
- h. some other aspect, please name:

**Section 3: Sustainability in general**

18. We would like to understand what the term “sustainability” means to you. Please take a moment to brainstorm and list 4 to 6 words that come to mind when you hear or see the terms “sustainable” or “sustainability”.

19. Please briefly describe, in a sentence or two, what sustainability means to you.

20. When a company refers to their product as sustainable, what do you think this might mean? For instance, consider that a company has marketed their product as sustainable one, what would you expect to think of such a product? Please mention 3 to 5 aspects that you would consider relevant to your perception of the product.

21. When thinking of how business is related to sustainable development, how critical are the following issues in your opinion currently and ten years from now? Rate each of the issues from 1 to 7. (1= not important at all, 7= very important)

- a. Environmental protection in general
- b. Preventing the climate change
- c. Waste and emission management
- d. Workers’ right and working condition
- e. Investing on new invention that have positive social impact (e.g., in terms of caring and helping of minorities)

- f. Charity or voluntary work in helping people in need
- g. Others, please specify: \_\_\_\_\_

#### **Section 4: consumption of ecological products**

By ecological product here we mean any product that has been labeled by an eco-label or is stated by the seller or marketer to be a more ecological choice. By normal product we mean any product that has not any eco-labels on them and of which no such claims are made.

22. I buy ecological products.

if YES → answer to questions 1 and 2 below

if NO → jump straight to question 3

23. Please indicate the degree to which you agree with the following statement when it comes to grocery products. From 1 to 7. (1= I strongly disagree, 7= I strongly agree)

- a. The quality of ecological products has improved within the last 5 years.
- b. The price of ecological products has come down within the last 5 years.
- c. The availability of ecological products has improved within the last 5 years.
- d. The range of ecological products has improved within the last 5 years.
- e. The quality of ecological products will improve within the next 10 years.
- f. The price of ecological products will come down within the next 10 years.
- g. The availability of ecological products will improve within the next 10 years.
- h. The range of ecological products will improve within the next 10 years.

24. Please indicate the degree to which you agree with the following statement when it comes to paper products (copy paper, envelopes, notebooks and calendars, household paper etc.). From 1 to 7. (1= I strongly disagree, 7= I strongly agree)

- a. The quality of ecological products has improved within the last 5 years.
- b. The price of ecological products has come down within the last 5 years.
- c. The availability of ecological products has improved within the last 5 years.
- d. The range of ecological products has improved within the last 5 years.
- e. The quality of ecological products will improve within the next 10 years.
- f. The price of ecological products will come down within the next 10 years.
- g. The availability of ecological products will improve within the next 10 years.
- h. The range of ecological products will improve within the next 10 years.

25. How well the following statements describe your buying behaviour, using a scale from 1 to 7. (1 = Strongly disagree, 7 = Strongly agree)

- a. I search the options on shelves to see if there are eco products when I shop.
- b. I normally just pick up a product that I like without considering the sustainability issues
- c. I search for information about sustainability (e.g. Co2 footprint, product ethical issue etc.) when I purchase a product.
- d. I avoid buying products that are harmful to the environment.
- e. I avoid buying products that are unethical.

26. Please rate the following statements on a scale from 1= strongly disagree to 7 = strongly agree.

- a) I would pay more to buy products from a socially responsible company
- b) I consider the ethical reputation of businesses when I shop
- c) I avoid buying products from companies that have engaged in immoral actions
- d) I would pay more to buy products from companies that show care for the well-being of our society
- e) If the price and quality of two products are the same, I would buy from a firm that has a socially responsible reputation

### **Section 5: Eco-labels**

27. If there is an eco-label, how often do you take eco-labels' information into account when purchasing a product?

Always

Often

Sometimes

Only occasionally

Never

I don't know

28. How well the following statements describe your buying behaviour, scale them from 1 to 7. (1 = Strongly disagree, 7 = Strongly agree)

- a. I pay attention to the eco-labels if they are presented on the products.
- b. When I read the additional information on packaging about ecological/sustainable impact, I found that labels are more helpful than words.
- c. I don't trust the reliability of eco-labels and sustainability information on products.

29. When there is an eco-label that I don't understand, I search for information through (multiple choices are available)

- a. the website that provided from the package
- b. ask friends or family
- c. Internet searching engine (e.g. Google)
- d. QR code if it is available
- e. I don't know where to search for information
- f. I don't search for information

30. How useful are the different formulations of eco-labels below to you?

a. Label only



Very useful

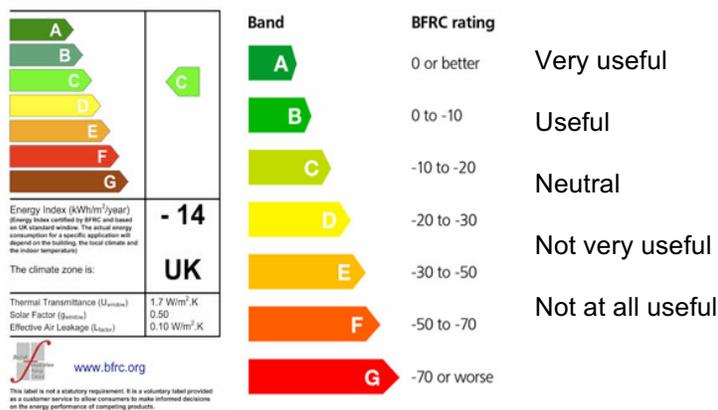
Useful

Neutral

Not very useful

Not at all useful

b. Label with scales and a little verbal explanation



c. pure text in label presentation

<b>Environment Facts</b>	
Total product mass: 2573g	
Recycleable content	74%
Post-consumer recycled content	12%
Renewable resource content	17%
Carbon Footprint (thru mfg)	393 kg
Energy used in Manufacturing	457MJ
Energy recoverable	32MJ
Power use - hibernation	0.01 watts
Power use - stand by	0.2 watts
Power use - normal	47 watts
Power use - max	63 watts
Lead (Pb) 0.2g in exempt applications	
Bromine (Br) 23.6g in exempt applications	
Chlorine (Cl) .04g	
Other Halogens 5.4g	
<b>REACH Candidate SVHCs &gt;0.1% by wt</b>	
Dibutyl phthalate	
Bis (2-ethyl(hexyl)phthalate) (DEHP)	
<b>Other ingredients</b>	
Iron, copper, ABS plastic, epoxy, nickel, tin, bioplastic, aluminum, silicon, tantalum, silver, titanium, chromium, boron, ruthenium, palladium, indium, beryllium, calcium	
This product contains less than 0.1% by weight in homogeneous materials of the following: mercury, hexavalent chromium, PBBs, PBDEs; less than 0.09% chlorine; and less than 0.01% cadmium	

Very useful

Useful

Neutral

Not very useful

Not at all useful

### Section 6: Forestry sustainability

31. When you think of forest-based business (e.g. logging and paper pulping), how important are these sustainability issues in your opinion currently? Rate each of the issues from 1 to 7. (1= not important at all, 7= very important)

- a. Environmental protection in general
- b. Preventing the climate change
- c. Waste and emission management
- d. Workers' right and working condition
- e. Investing on new invention that have positive social impact (e.g., in terms of caring and helping of minorities)
- f. Charity or voluntary work in helping people in need
- g. Others, please specify: \_\_\_\_\_

32. Please assess the following statements on scale from 1 to 7. (1= not important at all, 7= very important)

- a. The forest industry is sustainable
- b. The sustainability of the forest industry should be improved
- c. The forest industry has a big impact in improving the world's sustainability.
- d. In the future there will be more diversified use for wood than today
- e. I think sustainably managed forest\* is the future of forestry industry.

\*Sustainably managed forest means a forest that is managed carefully and skillfully. When trees are fallen, seeds put to replace them and they will eventually grow to be mature trees. Forest is seen to be a working environment that provides raw materials to forest-based industry in production, such as furniture manufacturing and wood pulp for paper.

33. Please answer these questions based on the knowledge, belief, or image that you have of forest industry. (Likert scale 1-7, strongly disagree / strongly agree)

- a. Compared to other natural resource based industries (mining, oil and gas), the forest industry has invested a lot to improve its sustainability
- b. Compared to other industries, the forest industry's environmental performance is weak
- c. Forest industry has a weak reputation for social issues
- d. In general, forest industry does not violate labour rights in developing countries
- e. The actions of forest industry decrease the quality of life of local people
- f. The forest based products are in general sustainable, since wood is renewable material
- g. Activities of forest industry has negative impact on forest biodiversity
- h. The resource efficiency of the forest industry is low
- i. The energy efficiency of the forest industry is low
- j. The way forest industry is using water resources is unsustainable
- k. Forest industry emissions decreases the quality of air
- l. Forest based products are carbon neutral
- m. Wood from tropical plantation is more sustainable than wood from boreal forest

34. The following questions concern the future. Please answer these questions on the knowledge that you have (likert scale 1-7, strongly disagree / strongly agree)

- a. In the future there will be shortage of forests
- b. In the future, wood will be used for making furniture more often than today
- c. In the future, wood will be used as construction material more often than today
- d. In the future wood will be used as raw-material for clothing more often than today
- e. In the future wood will be used as raw-material for medicine more often than today
- f. In the future wood will be used as raw-material for food more often than today
- g. In the future, wood will be used as a substitute in many currently oil-based products, such as plastic.
- h. In the future the recreational use for forests will be greater than today

## **Section 7: Consumption on forest-based products**

35. Please indicate the degree to which you agree with the following statements about the specific product category from 1 to 7. (1 = Strongly disagree, 7 = Strongly agree)

**Paper products** (copy paper, envelopes, notebooks and calendars, household paper etc.):

- a. When buying these types of products, I do not usually consider their sustainability.
- b. The ecological product is more expensive than its normal alternative.
- c. The ecological product is of better quality than its normal alternative.
- d. The ecological product is of lesser quality than its normal alternative.
- e. There are not enough ecological choices for this product.
- f. When there is an ecological alternative available I prefer it over the normal product.
- g. The ecological choices for this product are not conveniently available to me.
- h. I do not know where to look for ecological options for this product.
- i. I would be willing to pay more for the ecological than the normal alternative of these types of products.

**Wooden furniture** such as beds, tables and shelves:

- a. When buying these types of products, I do not usually consider their sustainability.
- b. The ecological product is more expensive than its regular alternative.
- c. The ecological product is of better quality than its regular alternative.
- d. Ecological product is of lesser quality than its regular alternative.
- e. There are not enough ecological choices for this product.
- f. When there is an ecological alternative available I prefer it over the normal product.
- g. The ecological choices for this product are not conveniently available to me.
- h. I do not know where to look for ecological options for this product.
- i. I would be willing to pay more for the ecological than the normal alternative of these types of products.

APPENDIX 2

Table 16: SAS outputs Section 5 Q32

Dep. variable	Q32_1 The forest industry is sustainable					Q32_2 The sustainability of the forest industry should be improved					Q32_3 The forest industry has a big impact in improving global sustainability					Q32_4 In the future there will be more diversified or wood than today					Q32_5 I think sustainably managed forests are the future of forestry industry									
	Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
<b>Analysis Variable: Country</b>																														
Model	1	3.93	3.93	1.85	0.18	1	4.58	4.58	3.18	0.08	1	3.49	3.49	2.03	0.16	1	0.02	0.02	0.01	0.92	1	2.90	2.90	1.72	0.19					
Error	149	316.86	2.13			148	213.29	1.44			148	254	1.72			148	252.22	1.70			147	247.25	1.68							
Corr. Total	150	320.79				149	217.87				149	257.49				149	252.24				148	250.15								
	R-Sq.	Coeff Var	Root MSE	Q32_1 Mean		R-Sq.	Coeff Var	Root MSE	Q32_2 Mean		R-Sq.	Coeff Var	Root MSE	Q32_3 Mean	R-Sq.	Coeff Var	Root MSE	Q32_4 Mean		R-Sq.	Coeff Var	Root MSE	Q32_5 Mean							
	0.01	28.34	1.46	5.15		0.02	20.87	1.20	5.75		0.01	23.79	1.31	5.51	0.0001	22.82	1.31	5.72		0.01	22.98	1.30	5.64							
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Country	1	3.93	3.93	1.85	0.18	1	4.58	4.58	3.18	0.08	1	3.49	3.49	2.03	0.16	1	0.02	0.02	0.01	0.92	1	2.90	2.90	1.72	0.19					
<b>Analysis Variable: Gender</b>																														
Model	2	0.28	0.14	0.07	0.94	2	0.99	0.50	0.34	0.72	2	2.73	1.37	0.81	0.45	2	3.74	1.87	1.08	0.34	2	3.14	1.57	0.93	0.40					
Error	148	320.51	2.17			147	216.88	1.48			146	247.42	1.69			147	253.75	1.73			147	249.10	1.69							
Corr. Total	150	320.79				149	217.87				148	250.15				149	257.49				149	252.24								
	R-Sq.	Coeff Var	Root MSE	Q32_1 Mean		R-Sq.	Coeff Var	Root MSE	Q32_2 Mean		R-Sq.	Coeff Var	Root MSE	Q32_3 Mean	R-Sq.	Coeff Var	Root MSE	Q32_4 Mean		R-Sq.	Coeff Var	Root MSE	Q32_5 Mean							
	0.001	28.60	1.47	5.15		0.005	21.11	1.21	5.75		0.01	23.06	1.30	5.64	0.01	23.86	1.31	5.51		0.01	22.76	1.30	5.72							
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Gender	2	0.28	0.14	0.07	0.94	2	0.99	0.50	0.34	0.72	2	2.73	1.37	0.81	0.45	2	3.74	1.87	1.08	0.34	2	3.14	1.57	0.93	0.40					
<b>Analysis Variable: Age</b>																														
Model	5	26.27	5.25	2.59	0.03	5	3.44	0.69	0.46	0.80	5	7.79	1.56	0.92	0.47	5	1.23	0.25	0.14	0.98	5	21.91	4.38	2.74	0.02					
Error	145	294.53	2.03			144	214.44	1.49			143	242.36	1.69			144	256.27	1.78			144	230.33	1.60							
Corr. Total	150	320.79				149	217.87				148	250.15				149	257.49				149	252.24								
	R-Sq.	Coeff Var	Root MSE	Q32_1 Mean		R-Sq.	Coeff Var	Root MSE	Q32_2 Mean		R-Sq.	Coeff Var	Root MSE	Q32_3 Mean	R-Sq.	Coeff Var	Root MSE	Q32_4 Mean		R-Sq.	Coeff Var	Root MSE	Q32_5 Mean							
	0.082	27.70	1.43	5.15		0.016	21.21	1.22	5.75		0.03	23.06	1.30	5.64	0.0048	24.23	1.33	5.507		0.09	22.11	1.26	5.72							
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Age	5	26.27	5.25	2.59	0.03	5	3.44	0.69	0.46	0.80	5	7.79	1.56	0.92	0.47	5	1.23	0.25	0.14	0.98	5	21.91	4.38	2.74	0.02					
<b>Analysis Variable: Study Major</b>																														
Model	3	24.04	8.01	4	0.009	3	2.33	0.78	0.52	0.67	3	15.60	5.20	3.29	0.02	3	21.17	7.06	4.47	0.005	3	4.28	1.43	0.84	0.47					
Error	144	288.69	2.00			143	211.81	1.48			142	224.27	1.58			143	225.50	1.58			143	241.90	1.69							
Corr. Total	147	312.73				146	214.14				145	239.87				146	246.67				146	246.18								
	R-Sq.	Coeff Var	Root MSE	Q32_1 Mean		R-Sq.	Coeff Var	Root MSE	Q32_2 Mean		R-Sq.	Coeff Var	Root MSE	Q32_3 Mean	R-Sq.	Coeff Var	Root MSE	Q32_4 Mean		R-Sq.	Coeff Var	Root MSE	Q32_5 Mean							
	0.077	27.50	1.42	5.15		0.011	21.10	1.22	5.77		0.07	22.13	1.26	5.68	0.0858	22.73	1.26	5.52		0.02	22.65	1.30	5.74							
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Study Major	3	24.04	8.01	4	0.009	3	2.33	0.78	0.52	0.67	3	15.60	5.20	3.29	0.02	3	21.17	7.06	4.47	0.005	3	4.28	1.43	0.84	0.47					

Table 17: SAS outputs Section 5 Q33

Dep. variable	Q33_1 Compared to other natural resource based industries, the forest industry has invested a lot to improve its sustainability					Q33_2 Compared to other industries, the forest industry's environmental performance is weak					Q33_3 Forest industry has a weak reputation for social issues					Q33_4 In general, forest industry does not violate labour rights in developing countries				
<b>Analysis Variable: Country</b>																				
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	1	16.91	16.91	10.51	0.002	1	77.77	77.77	43.64	<.0001	1	18.01	18.01	10.12	0.002	1	0.50	0.50	0.26	0.61
Error	147	236.55	1.61			147	261.95	1.78			147	261.71	1.78			147	278.85	1.90		
Total	148	253.46				148	339.72				148	279.72				148	279.36			
	R-Sq.	Coeff Var	Root MSE	Q33_1 Mean		R-Sq.	Coeff Var	Root MSE	Q33_2 Mean		R-Sq.	Coeff Var	Root MSE	Q33_3 Mean		R-Sq.	Coeff Var	Root MSE	Q33_4 Mean	
	0.07	26.29	1.27	4.83		0.23	35.84	1.33	3.72		0.06	31.21	1.33	4.28		0.002	36.19	1.38	3.81	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Country	1	16.91	16.91	10.51	0.002	1	77.77	77.77	43.64	<.0001	1	18.01	18.01	10.12	0.002	1	0.50	0.50	0.26	0.61
<b>Analysis Variable: Gender</b>																				
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	2	3.15	1.57	0.92	0.40	2	0.71	0.36	0.15	0.86	2	4.79	2.39	1.27	0.28	2	0.41	0.20	0.11	0.90
Error	146	250.31	1.71			146	339.01	2.32			146	274.93	1.88			146	278.95	1.91		
Total	148	253.46				148	339.72				148	279.72				148	279.36			
	R-Sq.	Coeff Var	Root MSE	Q33_1 Mean		R-Sq.	Coeff Var	Root MSE	Q33_2 Mean		R-Sq.	Coeff Var	Root MSE	Q33_3 Mean		R-Sq.	Coeff Var	Root MSE	Q33_4 Mean	
	0.01	27.13	1.31	4.83		0.002	40.91	1.52	3.72		0.02	32.10	1.37	4.28		0.001	36.32	1.38	3.81	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Gender	2	3.15	1.57	0.92	0.40	2	0.71	0.36	0.15	0.86	2	4.79	2.39	1.27	0.28	2	0.41	0.20	0.11	0.90
<b>Analysis Variable: Study Major</b>																				
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	3	33.64	11.21	7.48	0.0001	3	39.40	13.13	6.32	0.001	3	21.07	7.02	3.90	0.01	3	2.35	0.78	0.42	0.74
Error	142	212.99	1.50			142	294.94	2.08			142	255.51	1.80			142	265.19	1.87		
Total	145	246.63				145	334.34				145	276.58				145	267.54			
	R-Sq.	Coeff Var	Root MSE	Q33_1 Mean		R-Sq.	Coeff Var	Root MSE	Q33_2 Mean		R-Sq.	Coeff Var	Root MSE	Q33_3 Mean		R-Sq.	Coeff Var	Root MSE	Q33_4 Mean	
	0.14	25.47	1.22	4.81		0.12	38.89	1.44	3.71		0.08	31.44	1.34	4.27		0.01	36.21	1.37	3.77	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Study Major	3	33.64	11.21	7.48	0.0001	3	39.40	13.13	6.32	0.001	3	21.07	7.02	3.90	0.01	3	2.35	0.78	0.42	0.74
<b>Analysis Variable: Age</b>																				
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	5	13.76	2.75	1.64	0.15	5	20.44	4.09	1.83	0.11	5	21.82	4.36	2.42	0.04	5	18.27	3.65	2.00	0.08
Error	143	239.70	1.68			143	319.28	2.23			143	257.90	1.80			143	261.09	1.83		
Corr. Total	148	253.46				148	339.72				148	279.72				148	279.36			
	R-Sq.	Coeff Var	Root MSE	Q33_1 Mean		R-Sq.	Coeff Var	Root MSE	Q33_2 Mean		R-Sq.	Coeff Var	Root MSE	Q33_3 Mean		R-Sq.	Coeff Var	Root MSE	Q33_4 Mean	
	0.05	26.83	1.29	4.83		0.06	40.12	1.49	3.72		0.08	31.41	1.34	4.28		0.07	35.51	1.35	3.81	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Age	5	13.76	2.75	1.64	0.15	5	20.44	4.09	1.83	0.11	5	21.82	4.36	2.42	0.04	5	18.27	3.65	2.00	0.08

Dep. variable	Q33_5 The actions of forest industry decrease the quality of life of local people					Q33_6 The forest based products are in general sustainable, since wood is renewable material					Q33_7 Activities of forest industry has negative impact on forest biodiversity					Q33_8 The resource efficiency of the forest industry is low				
<b>Analysis Variable: Country</b>																				
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	1	29.34	29.34	16.72	<.0001	1	2.92	2.92	1.27	0.26	1	19.11	19.11	10.2	0.002	1	27.73	27.73	17.78	<.0001
Error	145	254.51	1.76			147	336.92	2.29			146	273.72	1.87			145	226.17	1.56		
Corr. Total	146	283.85				148	339.84				147	292.83				146	253.89			
	R-Sq.	Coeff Var	Root MSE	Q33_5 Mean		R-Sq.	Coeff Var	Root MSE	Q33_6 Mean		R-Sq.	Coeff Var	Root MSE	Q33_7 Mean		R-Sq.	Coeff Var	Root MSE	Q33_8 Mean	
	0.10	32.40	1.32	4.09		0.01	34.39	1.51	4.40		0.07	27.20	1.37	5.03		0.11	31.44	1.25	3.97	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Country	1	29.34	29.34	16.72	<.0001	1	2.92	2.92	1.27	0.26	1	19.11	19.11	10.2	0.002	1	27.73	27.73	17.78	<.0001
<b>Analysis Variable: Gender</b>																				
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	2	7.95	3.97	2.07	0.13	2	16.40	8.20	3.7	0.03	2	2.32	1.16	0.58	0.56	2	0.02	0.01	0.01	0.99
Error	144	275.90	1.92			146	323.44	2.22			145	290.51	2.00			144	253.87	1.76		
Corr. Total	146	283.85				148	339.84				147	292.83				146	253.89			
	R-Sq.	Coeff Var	Root MSE	Q33_5 Mean		R-Sq.	Coeff Var	Root MSE	Q33_6 Mean		R-Sq.	Coeff Var	Root MSE	Q33_7 Mean		R-Sq.	Coeff Var	Root MSE	Q33_8 Mean	
	0.03	33.86	1.38	4.09		0.05	33.81	1.49	4.40		0.01	28.12	1.42	5.03		0.0001	33.42	1.33	3.97	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Gender	2	7.95	3.97	2.07	0.13	2	16.40	8.20	3.7	0.03	2	2.32	1.16	0.58	0.56	2	0.02	0.01	0.01	0.99
<b>Analysis Variable: Study Major</b>																				
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	3	6.46	2.15	1.12	0.34	3	4.99	1.66	0.72	0.54	3	6.86	2.29	1.14	0.34	3	15.16	5.05	3.03	0.03
Error	140	267.98	1.91			142	329.53	2.32			141	283.96	2.01			140	233.50	1.67		
Corr. Total	143	274.44				145	334.52				144	290.83				143	248.66			
	R-Sq.	Coeff Var	Root MSE	Q33_5 Mean		R-Sq.	Coeff Var	Root MSE	Q33_6 Mean		R-Sq.	Coeff Var	Root MSE	Q33_7 Mean		R-Sq.	Coeff Var	Root MSE	Q33_8 Mean	
	0.02	34.06	1.38	4.06		0.01	34.75	1.52	4.38		0.02	28.19	1.42	5.03		0.06	32.68	1.29	3.95	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Study Major	3	6.46	2.15	1.12	0.34	3	4.99	1.66	0.72	0.54	3	6.86	2.29	1.14	0.34	3	15.16	5.05	3.03	0.03
<b>Analysis Variable: Age</b>																				
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	5	22.98	4.60	2.48	0.03	5	11.65	2.33	1.02	0.41	5	8.41	1.68	0.84	0.52	5	8.54	1.71	0.98	0.43
Error	141	260.87	1.85			143	328.19	2.30			142	284.42	2.00			141	245.35	1.74		
Corrected	146	283.85				148	339.84				147	292.83				146	253.89			
	R-Sq.	Coeff Var	Root MSE	Q33_1 Mean		R-Sq.	Coeff Var	Root MSE	Q33_2 Mean		R-Sq.	Coeff Var	Root MSE	Q33_3 Mean		R-Sq.	Coeff Var	Root MSE	Q33_3 Mean	
	0.08	33.27	1.36	4.09		0.03	34.41	1.51	4.40		0.03	28.12	1.42	5.03		0.03	33.20	1.32	3.97	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Age	5	22.98	4.60	2.48	0.03	5	11.65	2.33	1.02	0.41	5	8.41	1.68	0.84	0.52	5	8.54	1.71	0.98	0.43

Dep. variable	Q33_9 The energy efficiency of the forest industry is low					Q33_10 The way the forest industry is using water resources is unsustainable					Q33_11 Forest industry emissions decrease the quality of air					Q33_12 Forest based products are carbon neutral					Q33_13 Wood from tropical plantation is more sustainable than wood from boreal forest				
<b>Analysis Variable: Country</b>																									
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	1	30.16	30.16	19.05	<.0001	1	0.20	0.20	0.14	0.71	1	5.00	5.00	3.29	0.07	1	10.10	10.10	5.68	0.02	1	66.32	66.32	30.04	<.0001
Error	147	232.78	1.58			147	211.91	1.44			147	223.36	1.52			147	261.23	1.78			147	324.55	2.21		
Corr. Total	148	262.94				148	212.11				148	228.36				148	271.33				148	390.87			
	R-Sq.	Coeff Var	Root MSE	Q33_9 Mean	R-Sq.	Coeff Var	Root MSE	Q33_10 Mean	R-Sq.	Coeff Var	Root MSE	Q33_11 Mean	R-Sq.	Coeff Var	Root MSE	Q33_12 Mean	R-Sq.	Coeff Var	Root MSE	Q33_13 Mean					
	0.11	31.30	1.26	4.02	0.001	28.72	1.20	4.18	0.02	27.87	1.23	4.42	0.04	33.90	1.33	3.93	0.17	41.85	1.49	3.55					
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Country	1	30.16	30.16	19.05	<.0001	1	0.20	0.20	0.14	0.71	1	5.00	5.00	3.29	0.07	1	10.10	10.10	5.68	0.02	1	66.32	66.32	30.04	<.0001
<b>Analysis Variable: Gender</b>																									
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	2	0.52	0.26	0.15	0.87	2	1.53	0.76	0.53	0.59	2	0.28	0.14	0.09	0.91	2	2.01	1.01	0.55	0.58	2	0.59	0.30	0.11	0.90
Error	146	262.42	1.80			146	210.58	1.44			146	228.08	1.56			146	269.31	1.84			146	390.28	2.67		
Corr. Total	148	262.94				148	212.11				148	228.36				148	271.33				148	390.87			
	R-Sq.	Coeff Var	Root MSE	Q33_7 Mean	R-Sq.	Coeff Var	Root MSE	Q33_10 Mean	R-Sq.	Coeff Var	Root MSE	Q33_11 Mean	R-Sq.	Coeff Var	Root MSE	Q33_12 Mean	R-Sq.	Coeff Var	Root MSE	Q33_13 Mean					
	0.002	33.35	1.34	4.02	0.01	28.72	1.20	4.18	0.001	28.26	1.25	4.42	0.01	34.53	1.36	3.93	0.002	46.05	1.63	3.55					
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Gender	2	0.52	0.26	0.15	0.87	2	1.53	0.76	0.53	0.59	2	0.28	0.14	0.09	0.91	2	2.01	1.01	0.55	0.58	2	0.59	0.30	0.11	0.90
<b>Analysis Variable: Study Major</b>																									
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	3	13.66	4.55	2.60	0.05	3	6.66	2.22	1.56	0.20	3	5.21	1.74	1.12	0.34	3	2.52	0.84	0.45	0.72	3	47.12	15.71	6.50	0.0004
Error	142	248.31	1.75			142	202.58	1.43			142	220.13	1.55			142	263.32	1.85			142	343.13	2.42		
Corr. Total	145	261.97				145	209.24				145	225.34				145	265.84				145	390.25			
	R-Sq.	Coeff Var	Root MSE	Q33_9 Mean	R-Sq.	Coeff Var	Root MSE	Q33_10 Mean	R-Sq.	Coeff Var	Root MSE	Q33_11 Mean	R-Sq.	Coeff Var	Root MSE	Q33_12 Mean	R-Sq.	Coeff Var	Root MSE	Q33_13 Mean					
	0.05	32.95	1.32	4.01	0.03	28.45	1.19	4.20	0.02	28.23	1.25	4.41	0.01	34.82	1.36	3.91	0.12	43.90	1.55	3.54					
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Study Major	3	13.66	4.55	2.60	0.05	3	6.66	2.22	1.56	0.20	3	5.21	1.74	1.12	0.34	3.00	2.52	0.84	0.45	0.72	3	47.12	15.71	6.50	0.0004
<b>Analysis Variable: Age</b>																									
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	5	17.41	3.48	2.03	0.08	5	7.08	1.42	0.99	0.43	5	6.65	1.33	0.86	0.51	5	13.99	2.80	1.55	0.18	5	68.33	13.67	6.06	<.0001
Error	143	245.53	1.72			143	205.03	1.43			143	221.71	1.55			143	257.34	1.80			143	322.55	2.26		
Corr. Total	148	262.94				148	212.11				148	228.36				148	271.33				148	390.87			
	R-Sq.	Coeff Var	Root MSE	Q33_1 Mean	R-Sq.	Coeff Var	Root MSE	Q33_2 Mean	R-Sq.	Coeff Var	Root MSE	Q33_3 Mean	R-Sq.	Coeff Var	Root MSE	Q33_3 Mean	R-Sq.	Coeff Var	Root MSE	Q33_3 Mean					
	0.07	32.59	1.31	4.02	0.03	28.64	1.20	4.18	0.03	28.15	1.25	4.42	0.05	34.11	1.34	3.93	0.17	42.30	1.50	3.55					
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Age	5	17.41	3.48	2.03	0.08	5	7.08	1.42	0.99	0.43	5	6.65	1.33	0.86	0.51	5	13.99	2.80	1.55	0.18	5	68.33	13.67	6.06	<.0001

Table 18: SAS outputs of Section 5 Q34

Dep. variable	Q34_1 In the future, there will be shortage of forests					Q34_2 In the future, wood will be used for making furniture more often than today					Q34_3 In the future, wood will be used as construction material more often than today					Q34_4 In the future, wood will be used as raw-material for clothing more often than today				
<b>Analysis Variable: Country</b>																				
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	1	49.58	49.58	25.18	<.0001	1	0.76	0.76	0.36	0.55	1	2.79	2.79	1.11	0.29	1	14.54	14.54	6.13	0.01
Error	148	291.36	1.97			148	311.00	2.10			147	370.01	2.52			148	351.03	2.37		
Corr. Total	149	340.94				149	311.76				148	372.81				149	365.57			
	R-Sq.	Coeff Var	Root MSE	Q28_1 Mean		R-Sq.	Coeff Var	Root MSE	Q28_2 Mean		R-Sq.	Coeff Var	Root MSE	Q28_3 Mean		R-Sq.	Coeff Var	Root MSE	Q28_3 Mean	
	0.15	28.17	1.40	4.98		0.002	35.88	1.45	4.04		0.01	38.07	1.59	4.17		0.04	39.02	1.54	3.95	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Country	1	49.58	49.58	25.18	<.0001	1	0.76	0.76	0.36	0.55	1	2.79	2.79	1.11	0.29	1	14.54	14.54	6.13	0.01
<b>Analysis Variable: Gender</b>																				
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	2	2.73	1.36	0.59	0.55	2	0.04	0.02	0.01	0.99	2	0.80	0.40	0.16	0.85	2	4.36	2.18	0.89	0.41
Error	147	338.21	2.30			147	311.72	2.12			146	372.00	2.55			147	361.21	2.46		
Corr. Total	149	340.94				149	311.76				148	372.81				149	365.57			
	R-Sq.	Coeff Var	Root MSE	Q28_1 Mean		R-Sq.	Coeff Var	Root MSE	Q28_2 Mean		R-Sq.	Coeff Var	Root MSE	Q28_3 Mean		R-Sq.	Coeff Var	Root MSE	Q28_3 Mean	
	0.01	30.46	1.52	4.98		0.0001	36.04	1.46	4.04		0.002	38.30	1.60	4.17		0.01	39.72	1.57	3.95	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Gender	2	2.73	1.36	0.59	0.55	2	0.04	0.02	0.01	0.99	2	0.80	0.40	0.16	0.85	2	4.36	2.18	0.89	0.41
Dep. variable	Q34_5 In the future, wood will be used as raw material for medicine more often than today					Q34_6 In the future, wood will be used as raw-material for food more often than today					Q34_7 In the future, wood will be used as a substitute for many currently oil based products, such as plastic					Q34_8 In the future, recreational use for forests will be greater than today				
<b>Analysis Variable: Country</b>																				
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	1	0.01	0.01	0.00	0.96	1	0.61	0.61	0.28	0.60	1	32.81	32.81	13.32	0.0004	1	5.71	5.71	3.48	0.06
Error	148	311.73	2.11			148	327.63	2.21			148	364.58	2.46			148	243.12	1.64		
Corr. Total	149	311.74				149	328.24				149	397.39				149	248.83			
	R-Sq.	Coeff Var	Root MSE	Q28_1 Mean		R-Sq.	Coeff Var	Root MSE	Q28_2 Mean		R-Sq.	Coeff Var	Root MSE	Q28_3 Mean		R-Sq.	Coeff Var	Root MSE	Q28_3 Mean	
	0.00002	34.39	1.45	4.22		0.002	40.00	1.49	3.72		0.08	34.67	1.57	4.53		0.02	27.66	1.28	4.63	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Country	1	0.01	0.01	0.00	0.96	1	0.61	0.61	0.28	0.60	1	32.81	32.81	13.32	0.0004	1	5.71	5.71	3.48	0.06
<b>Analysis Variable: Gender</b>																				
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	2	0.65	0.32	0.15	0.86	2	2.01	1.00	0.45	0.64	2	2.01	1	0.45	0.64	2	3.67	1.84	1.10	0.34
Error	147	311.09	2.12			147	326.23	2.22			147	326.23	2.22			147	245.16	1.67		
Corr. Total	149	311.74				149	328.24				149	328.24				149	248.83			
	R-Sq.	Coeff Var	Root MSE	Q28_1 Mean		R-Sq.	Coeff Var	Root MSE	Q28_2 Mean		R-Sq.	Coeff Var	Root MSE	Q28_3 Mean		R-Sq.	Coeff Var	Root MSE	Q28_3 Mean	
	0.002	34.47	1.45	4.22		0.01	40.05	1.49	3.72		0.01	40.05	1.49	3.72		0.01	27.87	1.29	4.63	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Country	2	0.65	0.32	0.15	0.86	2	2.01	1	0.45	0.64	2	2.01	1	0.45	0.64	2	3.67	1.84	1.10	0.34

Table 19: SAS outputs Section 4 Q25

Dep. Var.	Q25_1 I search the options on the shelves to see it if there are eco products when I shop					Q25_2 I normally just pick up a product that I like without considering the sustainability issues					Q25_3 I search for information about sustainability when I purchase a product				
<b>Analysis Variable: Country</b>															
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	1	1.02	1.02	0.33	0.56	1	7.30	7.30	2.98	0.09	1	1.04	1.04	0.44	0.51
Error	165	504.66	3.06			165	404.82	2.45			165	389.20	2.36		
Corr.Total	166	505.68				166	412.12				166	390.24			
	R-Sq.	Coeff Var	Root MSE	Q25_1 Mean		R-Sq.	Coeff Var	Root MSE	Q25_2 Mean		R-Sq.	Coeff Var	Root MSE	Q25_3 Mean	
	0.002	49.67	1.75	3.52		0.02	34.06	1.57	4.60		0.003	55.16	1.54	2.78	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Country	1	1.02	1.02	0.33	0.56	1	7.30	7.30	2.98	0.09	1	1.04	1.04	0.44	0.51
<b>Analysis Variable: Gender</b>															
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	2	41.89	20.95	7.41	0.0008	2	17.78	8.89	3.7	0.03	2	17.42	8.71	3.83	0.02
Error	164	463.78	2.83			164	394.34	2.40			164	372.82	2.27		
Corr.Total	166	505.68				166	412.12				166	390.24			
	R-Sq.	Coeff Var	Root MSE	Q25_1 Mean		R-Sq.	Coeff Var	Root MSE	Q25_2 Mean		R-Sq.	Coeff Var	Root MSE	Q25_3 Mean	
	0.08	47.76	1.68	3.52		0.04	33.72	1.55	4.60		0.04	54.15	1.51	2.78	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Gender	2	41.89	20.95	7.41	0.0008	2	17.78	8.89	3.7	0.03	2	17.42	8.71	3.83	0.02
<b>Analysis Variable: Study Major</b>															
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	3	25.11	8.37	2.79	0.04	3	10.47	3.49	1.39	0.25	3	8.54	2.85	1.21	0.31
Error	159	477.51	3.00			159	398.99	2.51			159	373.64	2.35		
Corr.Total	162	502.63				162	409.46				162	382.18			
	R-Sq.	Coeff Var	Root MSE	Q25_1 Mean		R-Sq.	Coeff Var	Root MSE	Q25_2 Mean		R-Sq.	Coeff Var	Root MSE	Q25_3 Mean	
	0.05	49.13	1.73	3.53		0.03	34.52	1.58	4.59		0.02	55.65	1.53	2.75	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Study Maj	3	25.11	8.37	2.79	0.04	3	10.47	3.49	1.39	0.25	3	8.54	2.85	1.21	0.31
<b>Analysis Variable: Age</b>															
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	5	21.38	4.28	1.42	0.22	5	10.50	2.10	0.84	0.52	5	14.81	2.96	1.27	0.28
Error	161	484.29	3.01			161	401.62	2.49			161	375.43	2.33		
Corr.Total	166	505.68				166	412.12				166	390.24			
	R-Sq.	Coeff Var	Root MSE	Q25_1 Mean		R-Sq.	Coeff Var	Root MSE	Q25_2 Mean		R-Sq.	Coeff Var	Root MSE	Q25_3 Mean	
	0.04	49.26	1.73	3.52		0.03	34.34	1.58	4.60		0.04	54.84	1.53	2.78	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Age	5	21.38	4.28	1.42	0.22	5	10.50	2.10	0.84	0.52	5	14.81	2.96	1.27	0.28

Table 20: SAS outputs Section 4 Q 28

Dependent variable	Q28_1 I pay attention to the ecolabels if they are presented on the product					Q28_2 When I read the additional information on packaging about ecological/sustainable impact, I found that labels are more helpful than words					Q28_3 I don't trust the reliability of ecolabels and sustainability information on products				
<b>Analysis Variable: Country</b>															
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	1	0.18	0.18	0.07	0.79	1	2.75	2.75	1.43	0.23	1	0.48	0.48	0.23	0.63
Error	161	395.61	2.46			161	308.42	1.92			161	335.70	2.09		
Corrected Total	162	395.79				162	311.17				162	336.18			
	R-Sq.	Coeff Var	Root MSE	Q28_1 Mean		R-Sq.	Coeff Var	Root MSE	Q28_2 Mean		R-Sq.	Coeff Var	Root MSE	Q28_3 Mean	
	0.0005	34.25	1.57	4.58		0.01	28.56	1.38	4.85		0.001	38.46	1.44	3.75	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Country	1	0.18	0.18	0.07	0.79	1	2.75	2.75	1.43	0.23	1	0.48	0.48	0.23	0.63
<b>Analysis Variable: Gender</b>															
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	2	28.27	14.14	6.15	0.0027	2	18.05	9.02	4.93	0.008	2	0.82	0.41	0.19	0.82
Error	160	367.52	2.30			160	293.12	1.83			160	335.37	2.10		
Corrected Total	162	395.79				162	311.17				162	336.18			
	R-Sq.	Coeff Var	Root MSE	Q28_1 Mean		R-Sq.	Coeff Var	Root MSE	Q28_2 Mean		R-Sq.	Coeff Var	Root MSE	Q28_3 Mean	
	0.07	33.12	1.52	4.58		0.06	27.93	1.35	4.85		0.0024	38.56	1.45	3.75	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Gender	2	28.27	14.14	6.15	0.00	2	18.05	9.02	4.93	0.01	2	0.82	0.41	0.19	0.82
<b>Analysis Variable: Study Major</b>															
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	3	14.55	4.85	1.99	0.12	3	5.89	1.96	1.01	0.39	3	16.81	5.60	2.74	0.05
Error	156	380.23	2.44			156	304.51	1.95			156	318.69	2.04		
Corrected Total	159	394.78				159	310.4				159	335.49			
	R-Sq.	Coeff Var	Root MSE	Q28_1 Mean		R-Sq.	Coeff Var	Root MSE	Q28_2 Mean		R-Sq.	Coeff Var	Root MSE	Q28_3 Mean	
	0.04	34.03	1.56	4.59		0.02	28.81	1.40	4.85		0.05	38.05	1.43	3.76	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Study Major	3	14.55	4.85	1.99	0.12	3	5.89	1.96	1.01	0.39	3	16.81	5.60	2.74	0.05
<b>Analysis Variable: Age</b>															
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	5	27.26	5.45	2.32	0.05	5	2.08	0.42	0.21	0.957	5	3.82	0.76	0.36	0.87
Error	157	368.53	2.35			157	309.08	1.97			157	332.37	2.12		
Corrected Total	162	395.79				162	311.17				162	336.18			
	R-Sq.	Coeff Var	Root MSE	Q28_1 Mean		R-Sq.	Coeff Var	Root MSE	Q28_2 Mean		R-Sq.	Coeff Var	Root MSE	Q28_3 Mean	
	0.069	33.48	1.53	4.58		0.007	28.95	1.40	4.85		0.01	38.75	1.45	3.75	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Age	5	27.26	5.45	2.32	0.05	5	2.08	0.42	0.21	0.957	5	3.82	0.76	0.36	0.87

Table 21: SAS outputs Section 5 Q30

Dependent variable	Label only					label with scales and a brief verbal explanation					pure text in label presentation				
<b>Analysis Variable: Country</b>															
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	1	7.46	7.46	6.23	0.014	1	0.39	0.39	0.4	0.53	1	0.69	0.69	0.39	0.53
Error	161	192.95	1.20			161	156.46	0.97			161	285.74	1.77		
Corrected Total	162	200.42				162	156.85				162	286.43			
	R-Sq.	Coeff Var	Root MSE	Label Only Mean		R-Sq.	Coeff Var	Root MSE	Label with Scale Mean		R-Sq.	Coeff Var	Root MSE	Pure text Mean	
	0.04	41.79	1.09	2.62		0.00	50.06	0.99	1.97		0.002	45.91	1.33	2.90	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Country	1	7.46	7.46	6.23	0.014	1	0.39	0.39	0.4	0.53	1	0.69	0.69	0.39	0.53
<b>Analysis Variable: Gender</b>															
Source	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F	DF	Sum of Sq.	Mean Sq.	F Value	Pr>F
Model	2	4.11	2.05	1.67	0.19	2	8.25	4.12	4.44	0.013	2	7.62	3.81	2.19	0.12
Error	160	196.31	1.23			160	148.60	0.93			160	278.81	1.74		
Corrected Total	162	200.42				162	156.85				162	286.43			
	R-Sq.	Coeff Var	Root MSE	Label Only Mean		R-Sq.	Coeff Var	Root MSE	Label with Scale Mean		R-Sq.	Coeff Var	Root MSE	Pure text Mean	
	0.02	42.28	1.11	2.62		0.05	48.94	0.96	1.97		0.03	45.49	1.32	2.90	
Source	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F	DF	Anova SS	Mean Sq.	F Value	Pr > F
Gender	2	4.11	2.05	1.67	0.19	2	8.25	4.12	4.44	0.013	2	7.62	3.81	2.19	0.12