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Does Eco-label Work for Consumers? A Quest for Identifying the Determinants of Consumers' Understanding and Perception of Eco-labels

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Abstract:

The term 'eco-labeling' has become a buzz word in today's sustainable business world. The use of eco-labeling in various forms has been increasing notably for past many years, sometimes as an environmental "requirement" and sometimes merely as a marketing tool. For whatever apparent purposes the labeling is used, the ultimate goals are to educate and encourage the consumers to buy and use environment-friendly products. However, with so many competing eco-labels available today, questions arise about how well they are attended and understood by consumers. Mentionable studies have already been done on various dimensions of consumer response to eco-labels. Yet gap exists in exploring an inclusive set of parameters for investigating consumer perception of eco-labels. This paper reviews the major works done on the field and makes a synthesis of their findings with a view to identifying all the possible factors to be taken into account for measuring consumer perception of eco-labeling of products. Thereby it develops a structural equation model (SEM) with a tentative inclusive set of 9 parameters to be used in the investigation of consumer understanding and perception of eco-labeling. These parameters are: consumer awareness, visibility and attention, consumer knowledge, consumer trust, credibility of the source, type and level of information, clarity of meaning, persuasiveness, and private benefits. Although mentionable limitation of the paper is that it has relied only on the available published literature, this can be treated as an exploratory or pilot study for guiding the designing of large scale future empirical researches for developing a dependable inclusive set of parameters for testing consumer understanding and perception of eco-labeling. The results are therefore at best only tentative.

Key words: Eco-label, sustainable business, environment-friendly product, consumer perception, parameters

Theme: Sustainability – Approaches and Implications

Sub-theme: Economic Approaches to Sustainability

Introduction

The rapid economic growth in the past years have witnessed increasing consumers' consumption worldwide causing environmental deterioration through over-consumption and utilization of natural resources (Chen & Chai, 2010). It is anticipated that if the current trend of economic growth and irresponsible consumption pattern continue, the environmental degradation would worsen with the consequences of global warming, depletion of stratospheric ozone layer, pollution of sea and rivers, noise and light pollutions, acid rain and desertification (Ramlogan, 1997). Therefore, on a global level, there is an increased awareness and concern of global warming and adverse climatic conditions. As a result, there is a spur in interest toward environmental protection and sustainable development. A general deterioration in the physical environment is driving individuals and organizations to implement changes for improving the current state of the environment. A shift towards more sustainable consumption pattern is required and it is important to increase people's environmental awareness and consciousness. People, as consumers, can reduce their impact on environment and make a positive difference through their purchasing decisions. The belief is that the consumer's pro-environmental concern is one of the determinants of their "green buying" behavior i.e., buying and consuming products that are environmentally beneficial (Mainieri et al., 1997). In deed, consumers can reduce their impact on environment and make a difference through their purchasing decisions. The rising number of consumers who prefer and are willing to buy eco-friendly products are creating opportunity for businesses that are using terms like "eco-friendly" or "environmentally friendly" as components of their offers. Hence, a better understanding of consumer preferences in this instance should allow businesses to acquire more market-applicable approach to survive and sustain in the competitive market.

One of the important ways to educate the consumers about environmentally friendly products is to use eco-label. During the last 30 years, a growing number of environmental labels have been developed by individual companies, industrial sectors and NGOs, national and international governmental organizations (EU, 2001; EPA, 1998). The increasing popularity of these labels must be seen in conjunction with the benefits they presumably bring to companies and consumers. From the company’s perspective, the labels are expected to legitimatize its business practices, protect it from public regulation and/or help it gain competitive advantages. From the

consumer's point of view, the labeling will reduce uncertainty about the environmental performance of products and enable consumers to choose products that cause less damage to the environment (Kollman and Prakash, 2001; Porter and van der Linde, 1995; EPA, 1998). In other words, there are many good reasons why companies should adopt environmental labeling schemes and why consumers should compensate such effort by purchasing environmental performance labeled products and services.

Historical Background

The concern for ecology involving consumption is not new. The idea can be traced back in the late 1960s (D'Souza *et al*., 2007) when the increasing and dangerous pressure of the production systems on the environment were recognized, several attempts have been made to move towards more sustainable and environmentally friendly approaches. Heightened interest in environmental issues over the past couple of years has led to environmental labeling in an effort to allow consumers to differentiate between more or less environment friendly products and sustainable consumption. Such actions assume that if consumers are presented with appropriate label information, their purchases will change and more sustainable purchasing will result (Horne, 2009). Eco-labels are one type of 'new' environmental policy instruments with the emphasis on the role of information about environmental impacts associated with producing, distributing, consuming and/or disposing of a product. As informational devices, eco-labels are "non-binding voluntary policy tools" (Jordan et al., 2003). Eco-labels are meant to influence consumer behavior toward buying a sound eco-labeled product.

Purpose, Need and Methodology of the Study

With a total of 437[1] eco-labels in 197 countries today, the new eco-labeling schemes are being added every year by different organizations, from non-profit to retailers (Saunders, 2010). However, with so many competing eco-labels available today, questions arise about how well they are understood by consumers? Do these increasing numbers of eco-labels create confidence or confusion in the mind of the consumers?

[1] See: http://www.ecolabelindex.com/

Accordingly, the effectiveness of the increasing number of eco-labels needs to be investigated on various dimensions including consumers' perception of such labels. The paper identifies an all inclusive set of factors to be used in investigating consumer perception of eco-labels and thus, propose a model of consumer perception of eco-labels.

Considering the rapid and accelerating growth of the use of eco-labels, whether as an environmental requirements or a marketing tool or as both, evaluation of the effectiveness of such labels in terms of consumer understanding or perception is called for. At the same time, such kind of study needs to be based on a valid and well defined all-inclusive set of factors. However, specific studies on the accumulation of all possible constructs for measuring consumer perception of eco-labels are, so far, close to nil signifying need for this study. To be noted, there are many established perception models in consumer behaviour, but there is no specific model incorporating all the possible constructs for assessing consumers' understanding of eco-labels.

The study followed the methodology of content analysis through a survey of literature from internet source like Google and databases such as EBSCO, Emarald, Science Direct, SCOPUS, etc.

Eco-Label: Meaning

An eco-label is a "visual communication tool indicating environmentally preferable products, services or companies that are based on standards or criteria" (Greener Products Glossary, 2012). Primarily it has to do with providing customers with certified environmental information about the products to differentiate them from conventional products and to promote environmental friendly consumption. It can be considered as an effective vehicle to promote green consumer behavior since it assists consumers in directly addressing environmental externalities and in making informed purchases. Although the definition of eco-label may vary from type to type, the concepts of eco-labeling and eco-label need to be clarified. According to Global Eco-Labeling Network (GEN, 2013), "Eco-labeling" is a voluntary method of environmental performance certification and labeling that is practiced around the world. An "eco-label" is a label which identifies overall, proven environmental preference of a product or service within a specific

product/service category. GEN also declares that “in contrast to "green" symbols, or claim statements developed by manufacturers and service providers, the most credible labels are based on life cycle considerations[2]; they are awarded by an impartial third-party in relation to certain products or services that are independently determined to meet transparent environmental leadership criteria”. There are also some other definitions of eco-label: An eco-label is a legally protected image that certifies that the product or service displaying that image complies with certain pre-defined environmental (and sometimes human health and social) criteria (F00419, 2010). Eco-labels enable those products with the least environmental impact to be distinguished from other similar products (F00419, 2010). However, eco-label regulations, as a form of information-based government intervention, work best "when the label's meaning is well understood by consumers and reflects their preferences” (Conner & Christy, 2004).

Eco-Label: Types and Scope

Labeling programs can be classified according to a number of program characteristics, as illustrated on the following figure (Figure 1).

Insert Figure 1 about here

Fundamentally eco-labels can be classified into two types: first-party or self-declared claims and independent third-party claims. As the name implies, self-declared labeling is placed on a product by the manufacturer, retailer or marketer. The labeling can be made on a single attribute or on an overall assessment of the product. Generally the labeling may include phrases like “environmentally friendly”, “organic”, recyclable”, “ozone friendly”, “degradable”, “pesticide-free” and so on along with any logo that reflect the environment-friendliness of the product. However this type of labeling is not usually independently verified. Independent third-party labeling, on the other hand, is based on compliance with predetermined criteria which are

[2] Life-Cycle Assessment (LCA) is a key to eco-labeling schemes. Properly implemented, LCA assists governments, industry and consumers in: understanding the complex environmental effects of products from "cradle-to-grave"; reducing environmental burdens caused by products during their life-cycle; and making environmentally-informed production and purchasing decisions (ISSUE PAPER, Issue No. 12, ECO-LABELLING; Available at: http://www.pca.org.au/site/cms/documents/issues/issues12.html

independently verified by a competent authority. The criteria are generally built on a product life-cycle approach.

The International Standards Organization (ISO), as part of its ISO 14000 series of environmental standards, has classified environmental labels into three typologies – Type I, II and III and has also specified the preferential principles and procedures for each. However, there are other types of label that are hybrids of these and those that do not fall easily into the ISO classification system (F00419, 2010). For these types of labels no ISO guidelines exist. For example, those labels often used on food products are not life cycle assessment based (LCA-based) but practice-based (identified herein as Type IV) (F00419, 2010). However, they are granted by a third party certification agency that refers to a specific environmental or sometimes ethical / social characteristic of the product, e.g. certified organic cotton, dolphin-safe tuna fishing or sustainable forestry (F00419, 2010).

Type I

Type I labels are normally voluntary, multi-criteria based, third party verified schemes that award a license to use the scheme label/logo for specific products or services that meet prescribed standards based on a life cycle assessment (LCA) approach including, for example, energy and water consumption, emissions, disposal, etc. The standards and scheme criteria are usually developed through the involvement of stakeholders and awarded after an independent process of verification. Examples of Type I eco-labels include the *Dutch Stichting Milieukeur* and the *EU Eco-label.*

Type II

This type of label is the most widely used to provide environmental information to consumers and other stakeholders. According to the official ISO definition, they are not awarded or verified by an independent authority but usually developed internally by companies and tend to take the form of a declaration, a logo, a commercial, etc. For example: 'made from x% recycled materials', 'biodegradable', 'recyclable' or 'free from chlorine'.

There have been many concerns about this type of label as some investigations have shown that claims can be vague, misleading and sometimes untrue (F00419, 2010). Some industries have

developed voluntary codes of practice regarding this type of labeling (F00419, 2010). Whilst label information of this type may not be malicious and may be well intentioned, in the absence of independent checks for compliance there is no way the consumer can identify if the manufacturer has abided by such codes. This is known as 'greenwashing' and can lead to consumers mistrusting labels in general (F00419, 2010).

Type III

Type III[3] labels are one of the most detailed forms of providing environmental information, and like Type I, are based on life cycle assessment. These types of labels are product specific and do not normally assess or weight the environmental performance of the products they describe but only the raw data, such as the quantity of emissions, is provided. Their evaluation is left to the consumer. Many of the carbon labels fall into this category whereby the amount of CO2 eq. emitted (as g/unit) is provided on the label.

The approach used in Type III labels involves the development of Product Category Rules (PCR), which are developed for each functional unit in a supply chain based on a life cycle approach. PCRs are owned by the labeling scheme.

Type IV

These labels go beyond the ISO Type II definition and do undergo a form of independent verification by a third party but do not rely on a life cycle assessment approach or actual measurements. These labels are generally based on a set of 'best practice' criteria or standards that are used to differentiate the product from main stream products, usually on the basis of the reputation of the organization issuing the label. For example, the *Forest Stewardship Council* certifies that labeled products are from forests managed to a specific set of protocols. An auditing process is undertaken to verify compliance and add credibility but a life cycle assessment of practices and their environmental impact is not undertaken.

[3] The definition of Type III should be considered as a “draft working definition” since ISO standard for this type is still on the process.

Analysis of Factors Influencing Consumer Response to Eco-Labels

As consumers' environmental concerns have been incorporated, by and large, in mainstream marketing, it is pragmatic from marketing communication perspective to investigate how consumers make informed choices about green products. Consumers' initial perception about any product is presumably formed partly by the exposure of information initiated by marketing communications including product labels. However, assessing the effectiveness of eco-labels is not a straightforward task due to the presence of other relevant variables affecting markets and consumer behavior (Teisl and Roe, 2005). Everyday consumers are exposed to plenty of environmental messages on product packages in various appearances such as recycled, recyclable, environment-friendly, eco-friendly, ozone-friendly, renewable, reusable and so on. D'Souza, Taghian and Lamb (2006) argued that unlike other physical attributes of a product, it is difficult for the consumers to detect environmental attributes unless there is adequate information about them.

The study conducted by Bjørner *et al.* (2002) on the effects of the 'Nordic Swan Label' on consumers substantiated the findings of the OECD (2005) study that most evidence on actual impact of eco-labels was more or less subjective. The study of Korean Environmental Labelling Association in 2004 (as cited in OECD, 2005) reported two surveys on consumer awareness of the label, carried out in 1999 and 2001. These surveys revealed that more than 50% of the Korean population recognized the logo of the Korean Eco-label, and over 70% had heard of the label. It is somewhat ironic that 72.5% of the surveyed people had experience in purchasing environmentally preferable products, whereas most of them said that "they did not see the label on the product" and only 16.8% had actually purchased a product with the Korean eco-label.

According to the study on eco-labels in the US electricity supply market (Teisl, Roe and Levy, 1999), potential environmental effects mainly depend on consumers' levels of education and environmental involvement, but also on the type of additional information available. For example, products described in the consumer survey as using renewable resources, provoked in consumers' minds an association with environmental friendliness, and, in such cases, an additional eco-label did not have a significant effect on consumer decisions. In other cases – e.g., when a labeled product was marketed as being inexpensive – the eco-label may have even

caused a negative reaction, especially if it was interpreted by the consumer as an attempt to manipulate his or her behavior.

In general, eco-labels seem to raise consumers' awareness of environmental issues and change their purchasing behavior while leading manufacturers to increasingly produce environmentally preferable goods. The literature seems to indicate that consumers are more or less aware of the main eco-label schemes, though their responses are not identical. However, sound and holistic research on consumers' understanding of eco-labels is scarce.

Synthesis of the Constructs for Assessing Consumers' Understanding & Perception of Eco-Labels

The following table (Table 1) summarizes the major constructs for evaluating consumers' comprehension of eco-labels followed by the detailed discussion. The constructs have been extracted from the relevant literature according to the guidelines of Hart (1998).

Insert Table 1 about here

Consumer Awareness

Research shows that the level of consumer awareness plays a significant role for the success of any eco-labeling scheme (Winters, 1994; Leire et al., 2004; Defra, 2010). A few studies undertaken periodically in Sweden during the late 1990s showed that the recognition of the label exceeded 50 percent each year and was rising. Consumers link the label with reduced environmental impact and generally considered the brand to be trust-worthy (Nilsson, Tuncer and Thidell, 2004).

Visibility and Attention

In an extended study conducted in four different countries, Thogersen (2002) reported that a large majority of consumers pay attention to eco-labels at least sometimes. However, another two studies conducted by Laric and Sarel (1981) concluded that the misperceptions were caused by consumers relaying on the symbol with a lack of attention to the detailed information. Similarly, Morris (1997) argues that the use of eco-labels may obscure relevant product

information and, thus, mislead consumers, and even encourage the consumption of more resources, which does more harm to the environment.

Consumer Knowledge

Consumer knowledge, in particular, about the verification process of eco-labels is important to consider in evaluating their perception of eco-labels. Gallastegui (2002) argued that the choices of consumers will depend on the subjective interpretation of the labels' credibility if they lack a thorough knowledge of the verification process of the various environmental labels. In another study, Verbeke (2008) argued that product information, such as logo, can have positive impact on consumers' choice of food only when they have adequate knowledge about the issue at hand.

Consumer Trust

Consumer trust, especially for organic food market, is a vital issue since consumers are not generally able to prove whether a product is an organic product, not even after consumption (Janssen and Hamm, 2011). It is very vital to have consumer trust in the product integrity since the credence attribute "organic" mostly involves a considerable price premium (Jahn, Schramm, & Spiller, 2005; McCluskey, 2000). McCluskey (2000) claimed that third-party certified labeling signifies a tool for gaining consumer trust in credence goods markets. However, some other studies reported that third-party certification reduces the paradox of information asymmetry between producer and consumer only if consumers trust the certification scheme (Golan, Kuchler, & Mitchell (2001); Jahn, Schramm, & Spiller, 2005; Albersmeier, Schulze, & Spiller, 2010). According to Ozanne (2003), "along with confusion about the language used in environmental labeling, consumers do not trust industry to make accurate environmental claims." It has also been reported that consumer distrust and confusion over manufacturers' environmental claims resulted in the demand for third-party labeling schemes (Baker and Miner, 1993; Eden, 1994; Erskine and Collins, 1997). More than two-thirds of the respondents in one survey distrust information from large companies and similar number agree that companies do not have moral or ethics (Lloyd, 2006). A survey conducted in four European countries (Norway, Spain, Germany and Italy) on consumer trust in delivery of eco-labels came up with identical results (Gertz, 2005).

It was found in several studies that consumers have a hard time in understanding what labels are aimed to communicate, and uncertainty about what a label means could be associated with mistrust (Thogersen, 2002). Thogersen showed that consumers pay attention to and use environmental labels in their buying decisions only if they trust such labels. Janssen and Hamm (2012) identified consumer trust as one of the crucial factors for the success of third-party certified eco-labeling scheme.

Credibility of the Source

Credibility or believability in labeling of a product plays a vital role in consumer assessments and intentions toward the product (Beltramini, 1988). Believability of the information in environmental labeling claim is conceptualized as how credible the information provided by the eco-label is perceived as being by the consumer (Sen and Bhattacharya, 2001). Credibility of the source of the eco-labels, as one of exogenous factors, can influence the consumers in using eco-labels to assist their purchase decision (Cary, Bhaskaran and Polonsky, 2004; Erskine and Collins, 1997; Nilsson, Tuncer and Thidell, 2004).

Any environmental label needs to be credible and robust (Carbon Trust, 2008; Defra, 2003). This is important not only for consumer confidence in the label, but also to ensure that the production chain is driven in a sustainable direction (Defra, 2010).

The credibility of information provided in eco-label has also been emphasized in the study of Crespi and Marett (2005). The study suggests that the information need be related to the environmental attributes of the product signaling the superiority of the product compared to the non-labeled product. One study reported that only 15% of the respondents found the environmental claims to be extremely or very believable (Dagnoli, 1991).

The credibility issue of eco-label is assumed to be directly linked with the ultimate response of the consumers in terms of buying decision. It is argued that environmental labels can only contribute to increase in sales and/or improve the image if consumers find them credible (Gallastegui, 2002; MAPP, 2000). However, the nature of credibility is said to be subjective (Pedersen and Neergaard, 2006). It is further argued that even though the third party verified

labels are supposed to be more credible, it will only have an impact on market demand if the consumers are able to recognize the products subject to third party verification (Pedersen and Neergaard, 2006). Unfortunately this is very difficult since third party verified labels are less in use than that of private labels (Thøgersen, 2000).

The Type and Level of Information

The part of the reasons why consumers rarely search out, read or properly process all of the information available when shopping is likely to be the way in which the information itself is presented: the type, complexity and amount of information provided (BRE and NCC, 2007). The study of Teisl, Roe, & Levy (1999) on eco-labels in the US electricity supply market suggests that the type of additional information available on the label also has an impact on potential environmental effects. Some highly recognized certification marks, when combined with misperception of their information content, may influence consumers in taking inappropriate decisions (Laric & Sarel, 1981). There are assertions that such misperceptions existed for years (Gordon, 1939; Grant, 1969; Parkinson, 1975; and Phelps, 1949).

According to Maronick and Andrews (1999), whether the information claim is general or specific can have a vital role for the consumers in generalizing the marketing information. This concern is supported by the study of Darley and Smith (1993) who argued that general claims are perceived as being more difficult for consumers to verify than specific claims since the former is open to many likely interpretations. Ness et al. (2010) and Janssen, Heid, & Hamm (2009) argued that product information or labeling on the single benefits, such as the rejection of the use of pesticides and artificial additives, could attract new consumers for organic products.

The issue of verifiability is also emphasized in the study of Shimp (1983). Consumers tend to rely upon and find more believable those claims that are more specific or concrete (Ford, Darlene, & John, 1990; Hoch and Ha 1986; Pechmann, 1992). Hoch and Ha (1986) looked at it from a somewhat different outlook where it was reported that when general or ambiguous information is presented to consumers, they usually require further evidence that can have a marked effect on product perceptions. Likewise, in the writing of economics of information literature, Ford, Darlene, & John (1990) indicated that consumers often time perceive general or

subjective information as puffery reasoning. Example of such general or subjective information is "Environmentally Friendly". According to the study of Shimp & DeLozier (1986), when a product is advertised with such general claim, consumers are not likely to know the true meaning of the phrase until some further supportive information (e.g., This Product Is Environmentally Friendly Because It Contains No CFCs) is provided with.

Morris, Hastak and Mazis (1995) argued that consumer comprehension of specific environmental claims such as "recycled" and "recyclable" is not an issue to be very much agreed on. Rather, according to them, consumers are likely to be uncertain about the meaning of these terms since different manufacturers use these terms based on differing standards. For example, the claim "made from recycled materials" might be interpreted differently by different consumers. The product could be assumed to have recycled content ranges from one to 100 percent. This may ultimately lead consumers to be confused or suspicious of various eco-labels. On the other hand, overloaded information becomes a problem. The study of Lloyd (2006) found that 97% of those interviewed pointed out that there 'was more stuff to read than I could ever dream of reading' and 92% reported that they experienced 'surrounded' by information. Even consumer who know and trust a relevant environmental label will not use it due to information overload (Jacoby, 1984).

Clarity of Meaning

The significance of communicating the right meaning of the eco-label to the customers has been highlighted in several studies. According to Delmas (2010), although the objective of eco-labels is to reduce information asymmetry between the producer of green products and consumers, if eco-labels fail to communicate adequately they will not diminish the information gap between seller and buyer.

It is argued in some studies that consumers perceive product eco-labels as a requirement and demand proper and correct information on labels, but yet they seem to be somewhat confused about the green terminology used on product labels (Caswell and Mojduszka, 1996; Muller, 1985; Robertson and Marshall, 1987). Another reason that can lead consumers to misinterpret

the eco-label is the over exaggeration of the terms used in the label (D'Souza, Taghian, and Lamb, 2006).

Studies in Nordic countries revealed that in 1997 two out of every three consumers who could recognize the Swan label (the official sustainability eco-label for the Nordic countries) were not able to comprehend the meaning of the Swan label properly (AKF, 2002). The study found that consumers were becoming increasingly aware of the Swan label in 2000. Yet only 1 out of 3 consumers recognizing the Swan label was not able to clarify the right meaning of the label (AKF, 2002). Another study from MAPP (2001) on Swan label reported that above 50 percent of the consumers, irrespective of their environmental awareness, supported the fact that it was not possible for the common people to understand the meaning and content of the different labeling schemes. Besides, the study found that from 86.4% to 97.3% of the consumers feared that there were too many labeling schemes. Similar results were found in some other studies as well. An assessment of a campaign in Denmark promoting the Nordic Swan and the European Flower labels reported that although 36 percent of the consumers were able to identify the EU Flower, only 16 percent could recognize that it was an eco-label. Likewise about the Swan label, 68 percent of the consumers could identify the label whereas only 41 percent were able to relate the symbol with an eco-label (DEPA, 2001). Two separate studies were conducted to examine consumer comprehension of the term "recycled" focusing on basic understanding. Although both of the studies (Cude, 1993; George Washington University, 1991) agreed on the consumers' basic understanding of the term, none of the studies covered the issue of consumers' perception of the percentage and of the source of the recycled content in the product. Evidently, there is a very limited study on consumers' in-depth comprehension of the terms "recycled" and "recyclable". Three of such studies (Cude, 1993; CFE, 1991; Mayer, Scammon, and Zick, 1992) concluded that many consumers having no detailed understanding of the term "recyclable" may confuse the term "recyclable" with "recycled" and may overestimate the likelihood that products labeled "recyclable" will be recycled. Morris, Hastak and Mazis (1995) suggest that consumers might be misled by the overestimation of the amount of environmental benefit of product advertised if they lack in-depth comprehension. As a result, uncertainty remains with respect to how labels influence consumers and how well consumers comprehend the information provided on product labels (D'Souza, Taghian, and Lamb, 2006). D'Souza, Taghian, and Lamb (2006)

also argued that consumers' comprehension on labeling is determined by three factors: the accurate and clear meaning of these labels; the knowledge of labels; and the perception of businesses with respect to the environment.

Persuasiveness

Persuasiveness is defined as how convincing is the information provided by the label. Persuasiveness of information presented by the eco-label is found to be significantly influential in consumers' overall assessments of the eco-label (Bybee, 2010). A survey conducted by Chase and Smith (1992) revealed that 70 per cent of the respondents' purchase decisions were often influenced by environmental messages in advertising and product labeling. An empirical study was conducted by BjØrner, Hansen, & Russell (2004) for quantifying the impact of the Nordic Swan eco-label on consumers' brand choices of paper towels, toilet paper and detergents, using a large consumer panel from Denmark with detailed information on actual purchases from 1997 to 2001. The study reported that the label has had a significant effect on consumers' choices of brand. However, the opposite result is also evidenced in some other studies. Rex and Beaumann (2007) conclude from their work that although a significant amount of resources have been invested for eco-labels as one of the main green marketing tools, the market share of eco-labeled products is still low. Some other surveys also concluded that consumers' purchasing patterns do not always reflect their awareness level and that positive attitudes towards an eco-label does not necessarily mean it will be purchased by the consumers (Reiser and Simmons, 2005; Leire and Thidell, 2005).

Private Benefits

In addition to environmental attributes, consumers might also consider some other associated benefits labeled on eco-labels in evaluating them. These additional benefits may include labels such as "taste better" and/or "healthier" etc. Several studies found that the most important purchase criteria for organic products are related to quality rather than the environmental concern. Delmas (2010) hypothesized that if labels are not associated with private benefits, consumers might not be willing to pay a price premium for the eco-labeled product, thus providing private benefits attributes will help individuals improve their perception of eco-labels.

According to the report of Defra (2010), consumers' information processing when shopping is often triggered by the benefit they perceive from doing so.

In addition, consumer's level of education, gender, income and age could be also other influencing factors. In general, there appears to be strong correlation between environmental purchase behavior and the demographic characteristics of income, education and gender (Roper Organisation, 1990).

Proposed Model

The following graphical model (proposed) represents the design of the proposed empirical research:

Insert Figure 2 about here

The nine factors in the circles represent the latent constructs extracted from the literature. The effect/influence of these factors on consumer perception of eco-labels is proposed to be investigated using structural equation modeling (SEM) subject to the validity of each of the constructs confirmed by factor analysis. In addition, some studies argued that some of the demographic variables, particularly education, income, age, and sex, are likely to meddle consumer perception of eco-labels. Hence it is also proposed to test whether these demographics have any mediating or moderating effect on consumer perception of eco-labels. The mediating and moderating effect can well be detected in structural equation modeling.

Further Research and Implications

The main purpose of this paper has been to review the existing literature on eco-label from consumer perspective in a holistic approach and thus suggest an inclusive set of all possible determinants of consumers' understanding and perception of eco-labels. In line with the guidelines of literature review (Hart, 1998), efforts have been made to cover all the available studies and materials that have been conducted and used so far on the issue. As a first phase of further research, it is recommended to empirically determine the validity of the constructs based on a sample survey of consumers. Once the validity of the constructs is confirmed, the further

research should aim at testing hypotheses using the valid constructs on the target group using any multivariate statistics preferably 'Structural Equation Modeling (SEM)'. In addition, further exploratory study (e.g., focus group discussion) can be conducted to explore more constructs.

Conclusions

Thus the implication of this study is primarily limited to prepare strong theoretical foundation for further empirical research.

As one of the vehicles to the journey of sustainable development, the ultimate actor of eco-friendly consumption is the consumer. And eco-labels are ideally used as a media vehicle to "educate" the consumer for eco-friendly consumption. In marketing, it is generally said that when communicating to consumers, start where they start, speak how they speak, think about which aspects of the product are most important to them. Therefore, the green marketers need to learn where the consumers start, what they like to see, how they like to see, which aspects of the green products are important to them and so on. Accordingly consumers' understanding of the eco-labels needs to be warranted which can be possible by empirically investigating the consumers' reaction on eco-labels. Since there is no absolute measures for consumer understanding of eco-labels, it is inevitable to rely on well-defined and valid latent constructs.

Again, to initiate and/or amend any policy strategy for eco-labels, the government as well as other concerned organizations first need to know the present standing of the consumers regarding the eco-labels. It has been emphasized in scores of studies that for eco-labels to be workable, it must be well communicated and well-understood by the consumers. In communication language, the eco-label should not be "misfired".

Finally, an explicit understanding of the consumers' understanding would guide the marketers and other concerned organizations to tailor the eco-labels for different target markets, especially if empirical studies reveal significant variations in different market conditions.

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Annex 1: Figures

Figure 1: Classification of environmental labeling (EPA, 1998)

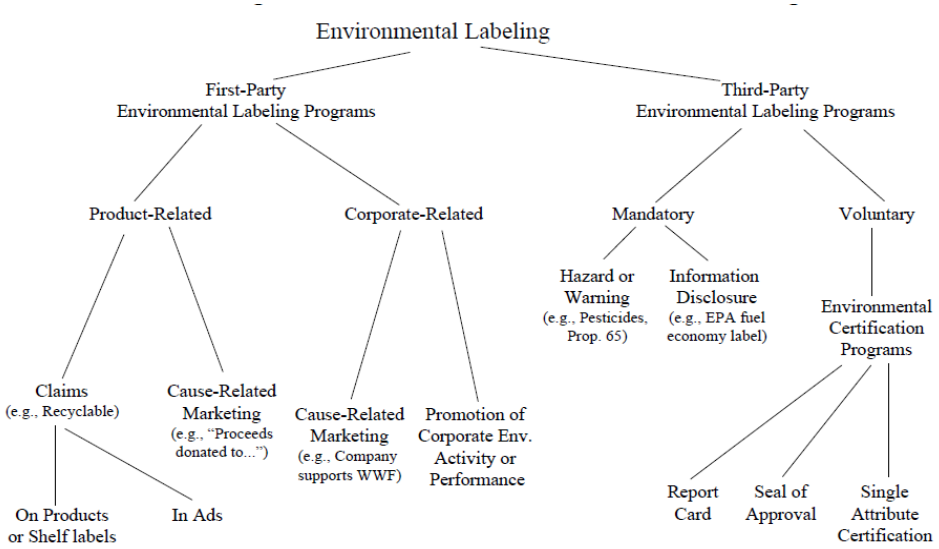
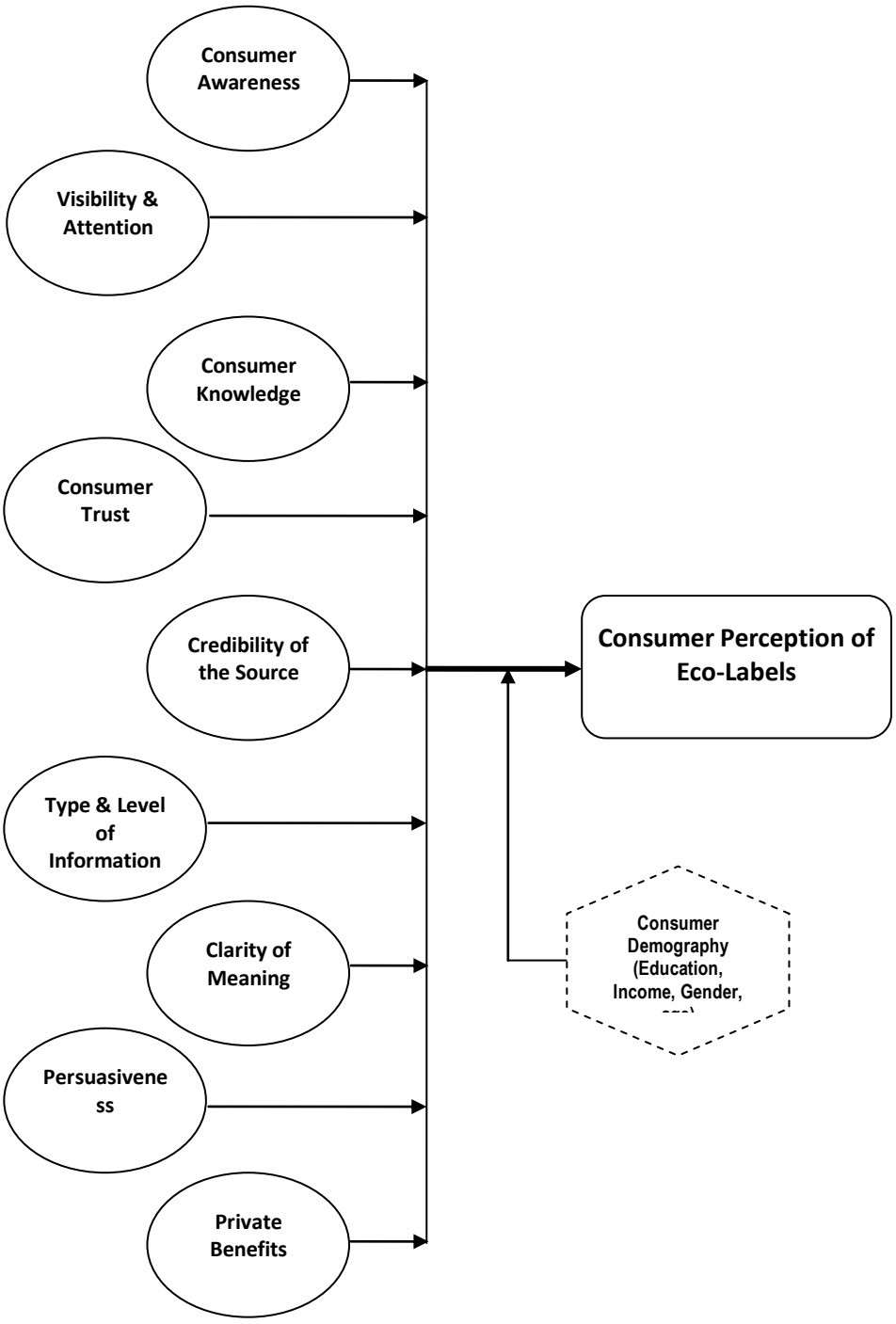


Figure 2. Conceptual model (developed by the authors)



Annex 2: Table

Table 1. Constructs for assessing consumer perception of eco-labels

CONSTRUCT	REFERENCE	KEY ARGUMENT
Consumer awareness	Winters (1994); Leire et al. (2004); Defra (2010)	- Consumer awareness is one of the key factors for an eco-label to be effective. - It is one of the key success factors for any eco-label.
Visibility and attention	Thogersen (2002); Laric and Sarel (1981)	- A large majority of consumers pay attention to eco-labels at least sometimes. - Consumer misperception of product labels is caused by consumers relaying on the symbol with a lack of attention to the detailed information.
Consumer knowledge	Gallastegui (2002); Pedersen and Neergaard (2006); Verbeke (2008)	- Consumer knowledge about the verification process of the eco-labels directly influences consumers' assessment of the label. - Lack of sufficient knowledge about the functional aspects of the eco-labels may lead consumers to be misguided by some opportunistic companies. - Adequate knowledge about production information (e.g., logo) can have positive impacts on consumers' food choice.
Consumer trust	Janssen and Hamm (2011, 20012); Golan, Kuchler, & Mitchell (2001); Jahn, Schramm, & Spiller (2005); Albersmeier, Schulze, & Spiller (2010); McCluskey (2000); Thogersen (2002)	- Consumer trust, as only proof of the product, is very vital for organic food market. - Consumer trust in the third-party certified labeling scheme can reduce the information asymmetry between producer and consumer. - Consumer distrust may make it hard for them to understand the meaning/content of the eco-labels.

Credibility of the source	Beltramini (1988); Cary, Bhaskaran and Polonsky (2004); Erskine and Collins (1997); Nilsson, Tuncer and Thidell (2004); Crespi and Marett (2005); Gallastegui (2002); MAPP (2000); Pedersen and Neergaard (2006)	- Credibility or believability in labeling of a product plays a vital role in consumer assessments and intentions toward the product. - Credibility of the source of the eco-labels, as one of exogenous factors, can influence the consumers in assisting their purchase decision. - The nature of credibility is subjective.
Type and level of information	BRE and NCC (2007); Maronick and Andrews (1999); Darely and Smith (1993); Shimp (1983); Ford, Darlene, & John (1990); Hoch and Ha (1986); Pechmann (1992); Lloyd (2006); Jacoby (1984); Ness et al. (2010) and Janssen, Heid, & Hamm (2009)	- The reasons why consumers rarely search out, read or properly process all of the information available when shopping are partly due to the type, complexity and amount of information provided. - The nature of the information claims, whether general or specific, can have a vital role for the consumers in generalizing the marketing information. - The issue of verifiability of the information is also emphasized. - Information overload may cause the consumers to be confused about the product label.
Clarity of meaning	Delmas (2010); Caswell and Mojduszka (1996); Muller (1985); Robertson and Marshall (1987); D'Souza, Taghian, and Lamb (2006); AKF (2002); MAPP (2001); DEPA (2001); Cude (1993); Dembkowski & Hanmer-Lloyd (1997); Pedersen & Neergaard (2006); Morris, Hastak and Mazis (1995)	- If eco-labels fail to communicate adequately, its purpose of reducing information asymmetry will not be achieved. - Consumers seem to be somewhat confused about the green terminology used on product labels. - Over exaggeration of the terms used in the eco-label may confuse the consumers. - Several studies revealed that many consumers, who are aware of the eco-labels, are not able to comprehend the clear meaning of labels. - Lack of in-depth understanding may lead the consumers to overestimate the amount of environmental benefits from using an advertised product.

Persuasiveness	Bybee (2010); Chase and Smith (1992);	- Consumers' overall assessment of the eco-label is found to be substantially influenced by the persuasiveness of the information presented by the eco-label. - Study found that 70 per cent of the respondents' purchase decisions were often influenced by environmental messages in advertising and product labeling.
Private benefits	Delmas (2010); Defra (2010);	- If labels are not associated with private benefits, consumers might not be willing to pay a price premium for the eco-labeled product. - Providing private benefits attributes will help individuals improve their perception of eco-labels. - Consumers' information processing when shopping is often triggered by the benefit they perceive from doing so.