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The environmental soundness and consumer understanding of eco-labelled food products in South Africa

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THE ENVIRONMENTAL SOUNDNESS AND CONSUMER UNDERSTANDING OF ECO–LABELLED FOOD PRODUCTS IN SOUTH AFRICA

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A Research Report submitted to the School of Animal, Plant and Environmental Sciences, Faculty of Science, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Masters in Science (course work / research report).

28 October 2015

Johannesburg 2015

DECLARATION

I declare that this research report is my own, unaided work. This research report is being submitted as part of the requirements for the degree of Masters in Science (CW / RR) at the University of the Witwatersrand, Johannesburg. It has not been submitted previously for any degree or examination at any other University.



_____

(Signature of candidate)

_____28th_____day of_____October_____2015_____

ABSTRACT

Eco-labels are voluntary policy tools for promoting environmental justice. Eco-labels have the potential to achieve environmental justice when they are environmentally reliable, and when they help consumers to be aware of, understand and feel motivated to purchase eco-labels. This study analysed the current situation of eco-labels in South Africa. There are a number of generic eco-labelling terms that have come into use on eco-labelled products. The history of the environmental problems that led to the use of these generic terms, along with the accreditation of such eco-labels was considered. The six most commonly found terms considered are "Dolphin Safe", "Badger Friendly Honey", "Genetically Modified Organism (GMO)-free", "Natural", "Free-range" and "Organic". The environmental reliability of the most common eco-labels found in local supermarkets was analysed. Overall, eco-labels scored well on environmental soundness and transparency but lacked in communication with consumers. The majority of the eco-labels were third-party certified and accredited by ISEAL (International Social and Environmental Accreditation and labelling) and IFOAM (International Federation of Organic Agriculture Movements). There are a variety of eco-labelled products for consumers to choose from in major supermarkets but the ratio of eco-labelled to regular food products is low, and the availability of eco-labelled products is not consistent. A questionnaire was used to assess the awareness, understanding and perception of consumers regarding eco-labels. The results were compared to a similar study on Swedish consumers to determine whether South African consumer perception regarding eco-labels differed greatly from first-world perceptions, as South African consumers have not had as much exposure to eco-labelled products. Consumer awareness and understanding varied significantly between local and international eco-labels. Generally, the number of consumers that have fully adopted eco-labels is low. However, South African consumers were found to have a pro-environmental attitude; many respondents felt that they would be willing to purchase eco-labelled products if they knew more about the eco-label. Improved stakeholder engagement among eco-labelling initiatives, supermarkets and consumers is required to foster better consumer knowledge of eco-labels and promote environmental justice locally.

KEYWORDS:

Eco-label; environmental reliability, availability, consumer awareness and understanding.

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CHAPTER 1: INTRODUCTION

1.1 The need for more sustainable food production

Food security is one of the focal points in global change studies (Porter *et al.* 2014). Providing enough food to a global population that is expected to grow to ten billion people is a challenge (Gilland 2002; Taagepera 2014). The current food production system has many flaws, which need to be rectified if we are to achieve food security in the future (Pimentel and Pimentel 2006; Bleda and Valente 2009). A few of these food production flaws can be illustrated with issues such as the impending depletion of phosphorus (which is used to make artificial fertilizers; Koppelaar and Weikar 2013), degrading soil and water quality (from the aforementioned artificial fertilizers and pesticides; Braden and Shortle 2013), "slash and burn" agriculture in third-world regions (Hauser and Norgrove 2013), and overfishing (Hentrich and Salomon 2006). If this method of food production continues, the environmental degradation caused by these poor practices will be so severe that we will no longer have the capacity to produce enough food to feed the world population (Gilland 2002; UNEP 2010).

Concerns over problems within the food industry have been growing over the past few decades. Notably, in the 1960s people became concerned over the ill health effects of artificial pesticides, which led to an increased demand for organic products. Over the past 50 years consumer concerns have moved from a health-related focus to include concerns about deforestation, biodiversity loss and unfair labour practices (Golden 2010).

In response to this, many people in the food production industry are trying to develop and follow more responsible practices. For example, more and more farmers are turning to organic farming and conservation agriculture, and some fishing companies are following quotas and policies that have been set to protect fish populations (Hentrich and Salomon 2006; Corbeels *et al.* 2013). The food products made using these more responsible techniques can be considered to be more sustainable than other products, which are made using typical/ regular production practices.

It is important that consumers are informed about which products are more sustainable, as they have the right to know exactly what they are purchasing, and some environmentally conscious consumers may prefer to buy more sustainable products (Hamilton and Zilberman 2006). A point-of-purchase tool used to convey the message that a product is more

sustainable to a consumer is an eco-label (Lefébure and Muñoz 2011). An eco-label provides a consumer with information on the product's history, by listing the techniques used to produce the product, on the product's packaging (Bleda and Valente 2009).

1.2 What is a sustainable product?

The concept of sustainable development was first promoted in 1987 following the release of the Brundtland Report, titled *Our Common Future*, which included the classic definition of sustainable development. The acceptance of the term by the United Nations General Assembly led to sustainable development being the main theme of the 1992 United Nations Conference on Environment and Development in Rio de Janeiro, Brazil. The political muster behind sustainable development has since lead to the development of certification schemes and governmental policies aimed at improving environmental and social matters around the globe (Drexhage and Murphy 2010). Eco-labels are a good example of such policies and initiatives. Eco-labels use various standards to rate the sustainability of a product, and a product will only be allowed to carry an eco-label if it adheres to these standards (Houe and Grabot 2009).

In the years since the classic definition of sustainable development was accepted, there have been many interpretations of the term sustainable development. Hence, each body of work that uses the terms "sustainable" or "sustainable development" must define exactly what is meant by "sustainable" in the context of that work (Harris 2003). This research report focuses on eco-labelled food products in South Africa. The two main areas of food production that this study deals with are agriculture and the fishing industry. In South Africa sustainable agriculture needs to conserve the natural resource base, prevent the degradation of soil and water, protect biodiversity, contribute to the economic and social well-being of all, ensure a safe and high quality supply of agricultural products, and safeguard the livelihoods and well-being of agricultural workers and their families (Department of Agriculture 2002). Sustainable fishing in this study is considered to be a fishing industry which implements the necessary fish stock protection measures, while protecting social and economic interests (Hentrich and Salomon 2006). Thus, a product resulting from these sustainable agricultural and fishing practices can be considered as a sustainable product in this research report.

Eco-labels are considered to be "green" products (Bleda and Valente 2009). "Green" is a generic term used to describe products which are in some way more environmentally and/or

socially responsible than regular products. For example, “organic” can be classified as a green product because no artificial pesticides, fertilizers or antibiotics would have been used in the production of the product (Aarset *et al.* 2004). “Eco-friendly” is another term that signifies environmentally responsible production practices, which can be used interchangeably with “green”. These green products carry eco-labels to signify their superior standard, and comprise a significant portion of the green market (Bleda and Valente 2009).

Eco-labelled products are a representation of products that have been produced to stricter environmental standards. Subsequently, in reading this report please note that the terms “more sustainable product” and “eco-friendly product” are used interchangeably.

1.3 The motivation behind eco-labels

The first official eco-label, Blue Angel, was created by the German government in 1978 (McCluskey and Loureiro 2003). The Blue Angel label was created to certify any type of product that had high environmental standards, allowing consumers to make more informed purchasing decisions. While Blue Angel is considered to be the first official eco-label, other initiatives such as organic farming and general organic labelling have been around since the 1960s. The organic labelling phenomenon originated due to the health concerns surrounding high pesticide usage on crops (Golden 2010). Eco-labels remained a unique feature to products until the 1990s when they became more widespread (Delmas *et al.* 2012). The supply and demand for eco-labels can be correlated to changes in the awareness of health and environmental concerns among consumers (Golden 2010), for example, the threat of climate change has rekindled the need that some consumers feel to make a positive difference regarding environmental issues (UNOPS 2009). Thus, eco-labels have matured to represent eco-friendly products too. Furthermore, consumers may be more likely to support eco-labels that promote environmentally responsible products.

Green marketing emerged when eco-food labels became widespread in the mid-1990s as market-based instruments with the intention to stimulate innovation (Delmas *et al.* 2012). Eco-labels encourage greener behaviour through market signals, rather than through categorical instructions regarding pollution control levels or methods (Bleda and Valente 2009; Delmas *et al.* 2012). Hence, eco-labels are environmental seals of approval, which are usually awarded by public or private organisations (Bleda and Valente 2009).

In Europe eco-labelled food products made up less than 10% of the market share by volume 10 years ago (Nilsson *et al.* 2004). In the USA 9% of all new products introduced eight years ago were "green" (Hamilton and Zilberman 2006). However, the use of eco-labels on food products is growing steadily, and while only a dozen eco-labels could be found in the 1990s, a total of 427 eco-labelling programmes were identified worldwide by 2012 (Delmas *et al.* 2012). Approximately 90 of the 427 eco-labels are for food products (D'Souza *et al.* 2012). In order to continue this positive growth trend, scientists and producers need to work together to understand exactly what may influence a consumer's decision to purchase an eco-labelled product, instead of its ordinary counterpart (Hamilton and Zilberman 2006).

In the last decade eco-labels have grown and evolved rapidly, in terms of production and geographic range. A variety of international, national and local labels are now available, so consumers have a choice among varieties of more sustainable products. While eco-labels were originally a first world concept, even developing countries are now creating their own eco-labels. For example, Green Choice Philippines was recently launched, and India has created the "Ecomark" label to recognise more sustainable products (Potts *et al.* 2014).

The cost of producing a sustainable product is often higher than that of a regular product, as materials may be more costly and labourers may be paid more fairly. Eco-labels are used to encourage consumers to pay this price premium (Delmas *et al.* 2012). Eco-labelled products often have a competitive advantage, as consumers want to support companies who are "doing the right thing" so purchasing an eco-labelled product is a positive experience (Hamilton and Zilberman 2006).

1.4 The basis and rationale for eco-labelling initiatives

The core aim of eco-labels is to promote environmental justice, which is grounded in the principle that all people have the right to live in and enjoy a healthy environment that is free from environmental pollution (Zaman *et al.* 2010). Environmental justice is the equal protection of all people with respect to the development, implementation and enforcement of environmental laws and regulations, and the assurance that environmental benefits are equally distributed (Durand 2002). Eco-labels are able to help achieve environmental justice by providing ecosystem support through environmental management to protect ecosystem services, which are the benefits that people receive from the environment, including water, food and timber (Zaman *et al.* 2010). Furthermore, the environmental justice movement is

used to describe the goals of eco-labels rather than a purely environmental effort because environmental justice was a term created to fight environmental racism where people in poorer areas of the USA, often people of colour, were not protected from pollution in their neighbourhoods. For example power stations and landfills were set up in poorer areas, discriminating against the right to a healthy environment for the people living in these areas (Sandler and Pezzullo 2007, de Oliveira Finger and Zorzi 2013). Eco-labels do have a strong environmental lens but many eco-labels aim to achieve social goals too, such as the FairTrade eco-label where labourers must earn fair wages.

To aid in visualising the connection between eco-labels and environmental justice, Oyewole (2001) developed a conceptual relationship among environmental justice, green marketing and industrial ecology (Figure 1). This conceptual relationship demonstrates how green marketing through eco-labels is perhaps a mechanism to promote equity in various socio-economic and environmental perspectives (Oyewole 2001).

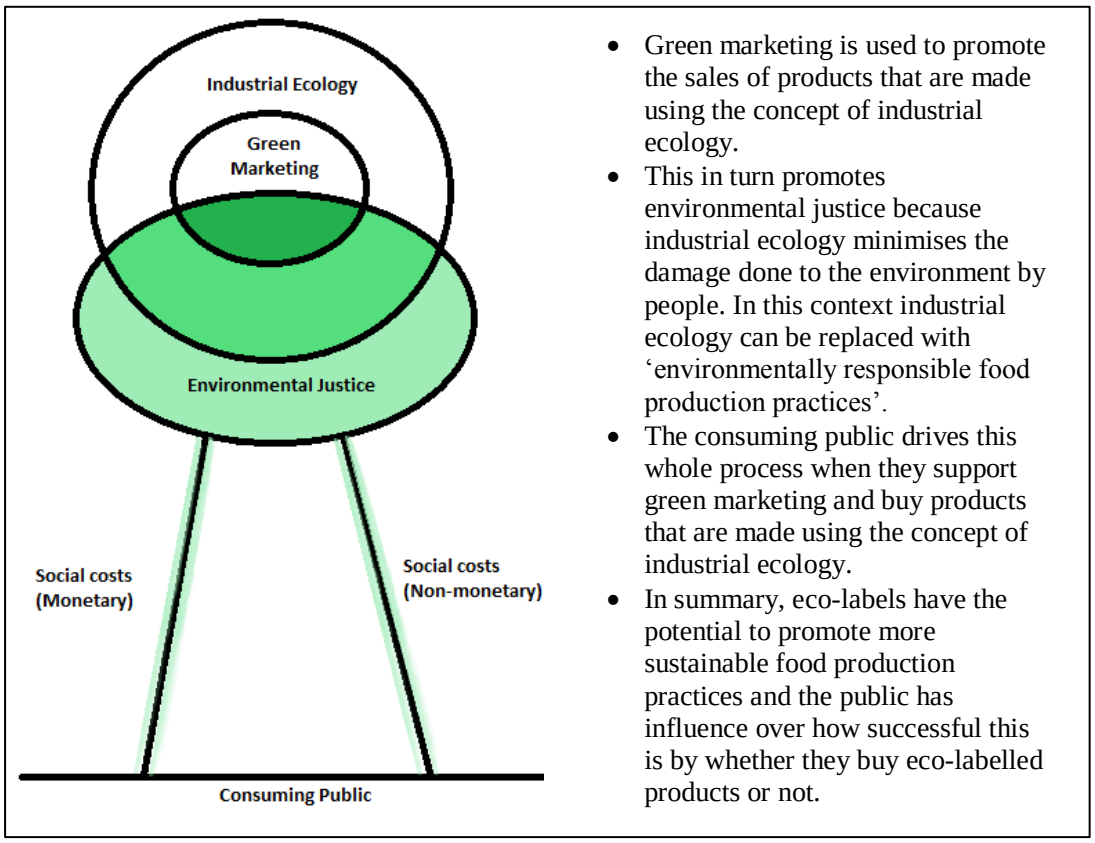


Figure 1: A conceptual relationship among industrial ecology, green marketing and environmental justice (adapted from Oyewole 2001, p 242)

Eco-food labels should drive agricultural practices that produce food of a high quality without causing any damage to the environment (Bleda and Valente 2009). Industrial ecology

is a design practice, which aims to ensure that there is no waste from any production process, by applying various technologies and approaches to production (Oyewole 2001). For the purpose of this study the term ‘industrial ecology’ can be replaced with ‘environmentally responsible food production practices’ in the conceptual relationship. Scores of eco-labels outline standards for achieving best practice by using environmentally responsible food production practices. However, it is important for environmental scientists to check up on these production processes to guarantee that they are indeed environmentally sound.

All of the drivers in the conceptual relationship are closely linked and are interdependent. If at any level in the model an element is flawed, then eco-labelled products will not be able to achieve the desired impact on environmental justice matters. Examples of these flaws are: false green marketing, a low standards level in practising industrial ecology, and that the consuming public is not interested in purchasing eco-labels (Oyewole 2001).

The success of eco-labels in relieving environmental problems is very difficult to quantify. There is no easily accessible, independent body of data on the effectiveness of eco-labels. Even the relatively high profile labels have not had large scale studies carried out to produce valid scientific data. Additionally, it is difficult to separate the effects of eco-labels on the environment from other variables due to long supply chains (UNEP 2005). For example, quantifying the positive environmental impact on a farm where an eco-labelled product originates from may be easy but measuring that impact in conjunction to the sale and uptake rate of the product becomes far more complex. While there are inadequate data on the environmental effectiveness of eco-labels, it can be said that eco-labelling can play a significant role in improving environmental problems in combination with other policy tools established by governments to encourage the development of greener economies (Erskine and Collins 1997).

1.5 Adverse effects of eco-labels

Eco-labels are designed to promote environmental justice and ecosystem support; this is an altruistic goal. However, this goal is being set by competitive companies who aim to make profits. Yet, truly altruistic acts cannot be competitive. This creates a myriad of problems with eco-food labels, including fraud, greenwashing and marginalising smaller / poorer producers (Zaman *et al.* 2010). Greenwashing describes the advertising of environmental

benefits through labelling practices that are perceived to be false, misleading, deceptive or vague (Lockard and Becker 2009)

Every so often instances of eco-label fraud breed distrust and contribute to the perception that eco-labels may lack credibility, because they are only used to gain a competitive advantage. Cases of companies misrepresenting food as GMO-free, antibiotic-free and as eco-fish have been documented. Numerous enterprises have faced criminal prosecution for selling conventional products as organic (Hamilton and Zilberman 2006). A model designed by Hamilton and Zilberman (2006) demonstrated that fraud is less common in markets where the number of eco-labels permitted is restricted. Furthermore, voluntary eco-certification policies decrease fraud. Additionally, the non-polluting techniques which would be implemented in green markets are precluded in regions where conventional environmental policies on polluting techniques are implemented. Hamilton and Zilberman's (2006) findings highlight the need for eco-labels to be a voluntary, yet well-monitored initiative to be successful at promoting better environmental standards with a low rate of fraud.

The above type of fraud has been dubbed "greenwashing", a common way in which companies' greenwash is by using unclear terminology on their eco-labels. These terms often have many different meanings and interpretations. For example, "organic" is often associated or confused with terms such as "ecological", "green", "environmental", "sustainable" and "natural" (Aarset *et al.* 2004). A term may also be used on a wide variety of products, which makes it challenging for consumers to understand the word's true meaning. For example, fruit and vegetables, dairy and animal produce, and cereals and grains are frequently described as "organic". There is a general definition, and general principles apply regarding the terminology used on eco-labels, but variations exist between and within countries. For instance, multiple certification bodies for organic produce exist and each certification body has its own variation of what "organic" means (Aarset *et al.* 2004).

Another way in which some corporations greenwash is by producing a few eco-friendly products, but not investing in upgrading the rest of their product line to be more responsible. For example, if a manufacturer creates a fridge with improved energy efficiency features but the manufacturer's other fridge models are still made with old technology that is not energy efficient. The green image of these companies will still improve, leading consumers to assume that all of the corporation's products are of a high environmental standard (Zaman *et al.* 2010). Such gaps in the consumer's understanding of eco-labelling and green companies

create opportunities for greenwashing. The majority of consumers do not have the time or interest to research the claims made on eco-labels. Consequently, they trust what they are able to understand from the eco-label and assume that it is superior on an environmental justice platform (UNEP 2005).

An example of more blatant greenwashing is the Sustainable Forestry Initiative (SFI). This forestry programme was formed in 1994 by North American forestry companies and operated for more than a decade before being ousted as a fraudulent set up. The SFI made four major claims which were all false, namely that SFI is independent, that SFI is backed by rigorous third party audits, that the SFI supply chain is easily traceable, and that SFI practices sustainable forestry. The SFI was actually funded by irresponsible forestry companies, did not have third party audits, and the supply chain is difficult to trace (Forest Ethics 2010). False marketing claims such as these allow poor social and environmental practices to continue, while misleading well intentioned consumers. The green washing that occurs within the eco-labels market creates confusion and erodes consumer trust.

A negative aspect of the eco-label industry with respect to producers is that some producers are excluded from being able to participate in eco-labelling initiatives (UNEP 2005; Ponte 2007). Agriculture is a way for unskilled people to earn a living, but if poorer farmers or fisherman cannot afford the process of eco-label certification then it can be argued that environmental justice is not being served by eco-labels as poor people are not empowered by the initiatives. For instance, much of the primary food produced in the southern hemisphere is sold in the northern hemisphere using eco-labels. Northern hemisphere consumer groups, food retailers and processors and government agencies believe that these eco-labels are an excellent way to protect the environment from over-exploitation and pollution, while also protecting producers from unjust labour and trade relations. However, in the south, this may not always be very advantageous for producers. It has been shown that sustainability certifications in the coffee and timber industries can indeed marginalise smaller producers and producers in poorer countries (Ponte 2007). Stakeholder-driven eco-labelling initiatives have tried to address this problem of marginalisation by inviting small producers to contact NGOs or foundations that would provide them with technical assistance and capacity building, such as training in composting technologies, intercropping, alternative food and cash cropping (Taylor *et al.* 2005; UNEP 2005; Ponte 2007).

Numerous eco-labelling initiatives have moved from a defensive position to a constructive dialogue phase to try and remedy the issues that their brand may create. This demonstrates that eco-labels are becoming more adaptable, which is essential as eco-labels have to be malleable enough to be applicable within extremely diverse local conditions and politics (Ponte 2007).

1.6 Green consumerism

1.6.1 Consumer understanding of eco-labels

In this context, consumer understanding is the extent to which a consumer can interpret the connection between an environmental issue, the label's meaning, and the corrective actions needed to elicit results. Consumer understanding is strongly linked to consumer awareness, although consumer awareness only indicates to what extent consumers know of an eco-label's existence. Hence, promoting consumer awareness is the first step to achieving consumer understanding of an eco-label (Delmas *et al.* 2012). However, Liere and Thidell (2005) observed that, even if awareness is high, the consumer's ability to understand the eco-label can be low. For example, the "Bio-Siegel" label, which is available throughout Europe, was recognised by 94% of German consumers, of which 90% correctly identified the label as meaning "organic", while in Turkey only 59% of consumers recognised the "Bio-Siegel" label and only 64% of those consumers knew that the label related to organic food (Mutlu 2007).

Consumers have diverse desires, values and characteristics, so time is an important factor for people to get to know and understand a label, as they will each view the label from a different perspective (Sirieix *et al.* 2011). Furthermore, many consumers have difficulties with understanding the meaning of the environmental information on labels, as they find this information overwhelming (Thøgersen 2002; Bleda and Valente 2009). Nevertheless, the understanding that a consumer has of an eco-label could have a significant impact on their decision when buying an eco-friendly product (Diem My 2012). Following this reasoning it is important for consumers to be exposed to an eco-label as regularly as possible, so that they will become familiar with it, understand it and hopefully buy the eco-labelled product.

The message quality of the information provided on the eco-label can have a significant impact on consumer understanding of the eco-label (Lefébure and Muñoz 2011).

Internationally there are also too many types of eco-labels on the market, which can lead to information overload (Pedersen and Neergaard 2006; Organization for Economic Co-operation and Development 2007; Thøgersen *et al.* 2010), for example, more than six internationally recognised eco-labels were created between 1972 and 2006 for coffee, each of which focuses on different standards – consumers, however, have difficulty recognising the differences between them (Auld 2010; Delmas 2010).

If consumers wish to find out more about an eco-label, then supplementary information can be found on the internet for most eco-labels (Diem My 2012). However, consumers may not be interested in putting in the extra effort to look up the meaning of the eco-label online. Thus, eco-label initiatives need to use multiple marketing platforms to increase awareness and understanding of their products (Nilsson *et al.* 2004; Diem My 2012). For instance, eco-labelling initiatives could have a sales representative stand in the store to explain the meaning of the eco-label to customers and to explain which environmental issues the label is addressing (Nilsson *et al.* 2004). This will help justify the price premium and encourage customers to buy the product.

1.6.2 Consumer trust of eco-labels

A large body of literature has explored which factors affect a consumer's decision to buy eco-labelled food. This literature reveals that the willingness of consumers to purchase eco-labelled food is largely dependent on consumer trust and understanding of the eco-label and that it is a gratifying experience (Hamilton and Zilberman 2006; Delmas *et al.* 2012).

There are two basic types of eco-labels. The first is created by an independent organisation that provides transparent environmental criteria and is verified by a third party. The second is created by some manufacturers as their own in-house eco-label which represents claims about the environmental friendliness of their product. The second type of eco-label can create doubt in the minds of consumers as to how credible eco-labels actually are. The credibility of an eco-label can be defined as the perception and assumption that the operations of a producer or distributor are trustworthy, responsible, appropriate and desirable (Delmas *et al.* 2012).

The environmental attribute of a product is a credence attribute, as consumers cannot assess what the total environmental impact of the product has been during its lifecycle. Thus, eco-labels must instil trust in the consumer, as they play a vital role in alerting customers to the

product's history (Bleda and Valente 2009). To become credible, an eco-label must differentiate between good and poor performance, have strong stakeholder involvement, be transparent, non-deceptive, free from conflicts of interest and must be based on reliable assessment (Delmas *et al.* 2012). To differentiate between good and poor performance an eco-labelling initiative must have a clearly written set of standards that food producers adhere to in order to be categorised as an environmentally responsible producer.

The relatively poor market penetration of eco-labels can be partly attributed to their lack of credibility as far as quality assurance is concerned. Eco-labels continuously fall short on the following aspects of credibility: the companies rely on their good reputation rather than the content of the eco-label, the eco-labels have unclear underlying values and objectives, the labels are often based on a range of uncompromising and impractical criteria, although they exclude relevant criteria, and the coverage of the food's impact as it moves along the supply chain is limited (Nilsson *et al.* 2004).

Media reporting also strongly affects consumer trust of eco-labels. Nevertheless, as the media does not always adequately verify the issues that are reported on, this can result in the brands of eco-labels being tarnished and consumers no longer trusting them (Lockard and Becker 2009). An example of this is the widely reported TerraChoice study titled "Six sins of greenwashing" (2007). TerraChoice is an environmental marketing company; their paper is difficult to verify and the methodology used has been questioned (Lockard and Becker 2009). TerraChoice found that only one out of 1018 eco-labelled products in the USA did not greenwash (TerraChoice 2007). However, the methodology used by TerraChoice to determine whether an eco-label is free from greenwashing may be unrealistic. Consequently, the results from the study may be misleading. Yet, this study by TerraChoice has been covered on CNN, MSNBC, *The Today Show*, *The New York Times*, and a host of other national publicity outlets (Lockard and Becker 2009). Studies, such as this example, that are not peer reviewed or verified but are widely reported in the media, are very damaging to the efforts of eco-label producers.

1.7 South African food labelling studies

The majority of studies on food labelling in South Africa seem to focus on nutritional labelling (van der Merwe and Venter 2010; Prinsloo *et al.* 2012). Two papers related to eco-labelling in South Africa were found during the literature review, namely on the labelling of genetically modified foods and the hake industry. One paper partially reviewed the ethical issues regarding the labelling of genetically modified (GM) foods. The review found that in South Africa the regulations permit voluntary labelling of food products containing GM ingredients, but that it is not compulsory to label these food products (van der Merwe and Venter 2010). This violates the buyer's right to decide what he or she wants to consume, as consumers are not provided with sufficient information to make an informed purchasing decision. A great ethical concern regarding GM labelling in South Africa is that "GMO (genetically modified organism) free" labelled food is still allowed to contain a small percentage of GM ingredients and this "small percentage" is not clearly defined. Conversely, there is insufficient research on the consumer's perception of GM labelling in South Africa (van der Merwe and Venter 2010).

Ponte (2007) investigated the political economy of the Marine Stewardship Council (MSC) certification of the hake industry in South Africa, and found that generally eco-labels are not simply based on value-free science and systematic management, but rather that they are wanted in the context of competitive pressures and specific political economies. Thus, eco-labels need to be set up in a unique way in each region to remain relevant within different political economies. Yet, thus far, developing countries are offered special flexibilities by the eco-labelling organisations. However, developing countries need sound systems of standards and verification procedures, not only special flexibilities (Ponte 2007).

To my knowledge, no study has been done on the environmental reliability and consumer understanding of eco-labels in South Africa. As a developing country with a large gap between the rich and the poor, South Africa has a population that can afford to purchase more eco-labels (albeit a minority) and a large workforce that could benefit from the advantages of eco-labels (Prinsloo *et al.* 2012). The many environmental problems in South Africa, especially concerning water pollution, could also be lessened by better agricultural practices, which could be encouraged through the use of eco-labels (Shabalala *et al.* 2013). In consequence, it is important that a study is conducted on the environmental reliability and perceptions of eco-labels, as this information can then be used to improve the marketing

strategies, credibility and sales of eco-labelled food. This research report will focus on ecosystem support (to examine whether eco-labels are environmentally reliable) and consumer understanding (to determine whether consumers are aware of eco-labels, whether they understand what the eco-labels mean, and whether they wish to support such initiatives), rather than the socio-economic aspects of environmental justice. Both ecosystem support and environmental justice are complex issues, hence more beneficial results would be obtained from addressing these issues in separate studies.

AIM

The aim of the study was to assess the environmental reliability of selected eco-food labels and their reliability as indicators of sustainable practice, as well as the public's understanding and perception of eco-labelled food products within South Africa.

Objectives

1. To identify common definitions of terminology used in eco-labels and from this define the meaning of this terminology in South Africa.

2. To identify the seven most common eco-labels currently used in South Africa.

3. To evaluate the reliability of the seven selected eco-food label initiatives in the context of ecosystem support.

4. To determine the prevalence of eco-labelled food products in three major supermarkets.

5. To evaluate South African consumer awareness and understanding of eco-food labels and their willingness to purchase sustainable food products.

CHAPTER 2: DEFINING THE COMMON ECO-LABELLING TERMS USED IN SOUTH AFRICA

2.1 Introduction

The wide array of environmental problems caused by the way that food is produced on a massive scale has led to a diverse selection of eco-labels which are each aimed at rectifying different environmental problems. A few general terms for eco-labels targeting specific problems have emerged. Many of these terms are used in a generic manner and are not certified by one specific body (see discussion on terms below).

For consumers to purchase eco-labelled products which display generic eco-labelling terms, they must be aware of, understand and trust the term and find the purchase a gratifying experience. All of these factors are closely related to message quality. Yet, many products that use generic eco-labelling terms do not provide any further information about the term on the products' packaging. It is imperative that consumers have access to additional information on these terms. This additional information should include a background on the environmental problems which led to the eco-labelling term being created, how products that use the term aim to rectify these issues, and whether the use of the term is regulated. Access to this additional information will build understanding and trust of the generic eco-labelling terms and will increase the feeling of gratification that customers experience when buying an eco-labelled product (Hamilton and Zilberman 2006; Delmas *et al.* 2012). Furthermore, the supplementary information provided must answer basic questions that consumers may have about these terms. For example, "Dolphin Safe Tuna" is certified by many different initiatives, from the United States government to the Earth Island Institute (Brown 2005), but who is certifying dolphin safe tuna in South Africa? "Badger Friendly Honey" is a South African label which is certified by the Endangered Wildlife Trust (Irlich and Davies-Mostert 2009) but what is the history behind the need for this label? The term "natural" is being used globally on food products but is this perhaps just a misleading term? Genetically modified organisms as a food source are very controversial, so are there any environmental benefits to purchasing "GMO-free" labelled products instead? The term "free-range" is being used on an increasing amount of livestock products, yet many consumers are still left wondering what the true difference between free-range and regular livestock is. "Organic" is one of the most

widespread eco-labels on the market and the environmental benefits of organic farming are frequently publicised, but are there any negative aspects to this method of farming?

All of the above questions can be challenging for consumers to answer on their own as a lot of research is required into the background of each topic. Even though the investigation of certified eco-labelling initiatives in South Africa covered in Chapter 3 provides a good foundation for consumers to base their purchasing decisions on, the information does not help consumers understand the general terms that are often used on eco-labels. Thus, Chapter 2 will cover objective one by summarising the history of these terms relating to the environmental impact that the labels are designed to address and whether these labels are certified, in-house or regulated by law. Objective one aims to identify common definitions of terminology used in eco-labels and from this define the meaning of this terminology in South Africa. The terms which will be covered are "Dolphin Safe Tuna", "Badger Friendly Honey", "Natural", "GMO-free", "Free-Range" and "Organic". Thus, chapter 2 will remedy confusion over what eco-labels mean in South Africa, which could potentially increase the rate at which eco-labelled products are purchased.

A literature review was completed for these six eco-labels that explored the background of environmental issues which led to the creation of the term/eco-label; whether the eco-label is certified by a particular body or whether there is any legislation in South Africa relating to the term; whether the eco-label has been successful in improving the environmental issues related to the term.

The eco-labelled products stocked by three supermarkets are listed in Chapter 3. From this list I selected the "eco-friendly" terms most commonly encountered in a range of products. Thus, the terms selected are not a random sample but are terms which can be considered generic to eco-labelling. Reviewing the literature surrounding these terms produced results that are quite specific, especially when connecting them in the South African context. Therefore, the number of references provided for some of the terms is limited.

2.2.1 Dolphin Safe

History of the label

Canned tuna in South Africa is practically always sold with a dolphin friendly / dolphin safe label on the can. The label was created to reduce dolphin mortality associated with the fishing

of yellow-fin tuna (*Thunnus albacares*) (Brown 2005; Baird and Quastel 2011; Robertson 2012). In the past fishermen would take advantage of the association between yellow-fin tuna and dolphins by chasing and circling dolphins and then throwing out seine nets to catch the tuna; these nets tighten at the bottom and are hauled up. Thus, any dolphins swimming above the tuna were caught and usually drowned or were crushed during the process (Brown 2005). Consequently, the Marine Mammal Protection Act was passed in 1972 in the USA to address various objectives, including dolphin bycatch. The Act led to the modification of fishing gear and the addition of on-board observer coverage on large fishing vessels, which reduced dolphin mortality from 252 000 in 1973 to 8258 in 1983. However, environmentalists did not feel that strict enough measures were being implemented by Government and, in response to this, the Earth Island Institute created the Dolphin Safe label (Brown 2005, National Research Council 1992). Specific criteria must be adhered to for the Earth Island Institute to award a Dolphin Safe label, which include avoiding encirclement of dolphins during an entire fishing trip, preventing accidental deaths or serious injuries of any dolphins, ending the use of drift gill nets, and should a dolphin be killed accidently, then the catch must be labelled as dolphin deadly and is not allowed to be mixed with a dolphin safe catch. However, independent observers are only required on ships that exceed 400 gross tons. Thus, much of the tuna fishing that occurs is unobserved (Brown 2005).

The Dolphin Safe label was created by the Earth Island Institute in 1990, but many variations of this label now exist (Brown 2005; Robertson 2012). In South Africa the following brands and fishing companies are currently certified as "Dolphin Safe Tuna" producers by the Earth Island Institute: ICV Africa, Y&L Fishing Enterprises (Pty) Ltd., Oceana Brands Ltd./ Oceana Group (Lucky Star), John West and Blue Seas Products (Fishing company) (Brown 2005; Earth Island Institute 2014).

Pitfalls of the Dolphin Safe label

A problem with dolphin friendly tuna labels is that it may create a false sense of "good-doing", as dolphins are not the only ocean creatures that consumers should be concerned about. Not all tuna species associate with dolphins, for example skipjack tuna (*Katsuwonus pelamis*), yet the dolphin friendly label is still applied to skipjack tuna products (Brown 2005; Baird and Quastel 2011). Seabirds, sea turtles and sharks are still common bycatch resulting from longline tuna fishing (DAFF 2012). Though there are insufficient data available, due to

a low occurrence of independent observers aboard fishing vessels, it is estimated that in 2012 seabird catch rates were a record low of 0,05 birds / 1000 hooks. A record low in the seabird catch rate is a great achievement but this figure is an average and some fisheries may be performing better than others in preventing the deaths of seabirds. The fisheries that perform at a more environmentally friendly level should be acknowledged for doing so. Between 1998 and 2005 an average of 0,04 turtles/ 1000 hooks and 6,01 sharks/1000 hooks were caught (Petersen *et al.* 2008a; Petersen *et al.* 2008b; DAFF 2012). This needs to be viewed in the context of tuna directed vessels setting 41,5 million hooks between 1998 and 2005 (Petersen *et al.* 2008b).

Sea turtles

There are seven turtle species worldwide, six of these species are classified as endangered or critically endangered on the IUCN's Red Data list, and the seventh one is listed as data deficient (IUCN 2014). Five of these turtle species occur in South African waters. Between 1998 and 2005 four turtle species (loggerhead turtles *Caretta caretta*, leatherback turtles *Dermochelys coriacea*, hawksbill turtles *Eretmochelys imbricate*, green turtles *Chelonia mydas*) were caught as bycatch in longline fishing for tuna and swordfish off the coast of South Africa (Petersen *et al.* 2008a).

Breeding grounds for loggerhead (endangered) and leatherback turtles (critically endangered) on the coastline of northern KwaZulu-Natal have been protected since 1965. An initial population increase between the 1960s and 1970s for both species was attributed to these protected nesting sites (Watson *et al.* 2005; Petersen *et al.* 2008a). A low population recovery rate since the initial increase is suspected to be caused by the killing of turtles in various fishing practices. Turtles are slow moving, making them vulnerable to capture in trawling nets. The need to surface for air causes turtles to drown when they bite onto the bait of tuna fishing longlines, which remain submerged for 8 hours at a time (Petersen *et al.* 2008a).

The capture of turtles by tuna fishing vessels is reported by on-board observers, but the data from this can be misleading. Thus, significant information on turtle capture for this data set could be missing. For example, the incidental capture of 181 turtles was recorded between 1998 and 2005, but it is estimated that between 190 and 560 turtles are killed annually by longline fishing practices in South African waters (Petersen *et al.* 2008a).

Sharks

Sharks (*Chondrichthyes*) are keystone species in many marine environments, as they are top predators with no natural enemies. In consequence, losses of these predators are likely to have profound negative effects throughout the food web (Baum & Myers 2004; Beerkircher *et al.* 2002; Petersen *et al.* 2008b). Sharks have always been bycatch in tuna fishing, but historically they were tossed overboard as they did not have value. Since the 1980s, however, shark fins have attained value through demand in Asia. So sharks are no longer just a nuisance of bycatch but are now desired bycatch as the fins can be cut off and stored easily while the rest of the shark is disposed of at sea (Weber and Fordham 1997; Shivji *et al.* 2002).

Twenty shark species were caught by longline fleets in South African waters between 1998 and 2005, six of these species are listed as vulnerable and one is endangered. This averaged to an estimated 43 000 pelagic sharks caught per year (Petersen *et al.* 2008b). Since sharks are essential for the stability of food webs, these catch rates need to be decreased to avoid a crash in shark population numbers, as sharks have low fecundity rates (Hoenig & Gruber 1990). Yet, no mitigation measures to reduce shark bycatch have been implemented. In 2004 the South African authorities implemented a 10% shark bycatch limitation on tuna fishing, but there has been poor compliance with this rule. A mitigation measure which is easier to monitor and enforce, is that all shark fins kept by a vessel must now be landed attached to the shark's trunk. This discourages fishermen from harvesting shark fins, as needing to keep the whole shark wastes freezer space which could rather be used for more valuable tuna (Weber and Fordham 1997). Blue Mako and Short-finned Mako are the most commonly caught shark species by long-line vessels in South Africa and, fortunately, around half of them can be released alive by cutting the line as close as possible to the animal. Further mitigation measures need to be explored to reduce shark mortality by longline fishing for tuna (Petersen *et al.* 2008b).

Sea birds

Pelagic seabirds have benefited from mitigation measures that have been enforced to reduce bycatch deaths. In the last decade there has been an 85% reduction in the mortality of seabirds from longline fishing (WWF 2011). In 2012 South Africa stood below the stipulated rate of 0,05 birds per 1000 hooks for the first time. This was achieved by stipulating

mitigation measures that must be met to receive a permit, including no daylight setting, compulsory flying of tori-lines, and the use of thawed bait to improve sink rates (DAFF 2012). If a vessel kills 25 birds in a year, then the ship must implement further mitigation measures by adding a second tori-line and more weights to each branchline (DAFF 2012).

Although the catch rate of seabirds is now lower, it is important to strive for even better practices as seabirds have conservative life histories and even relatively low catch rates can result in population declines (BirdLife International 2007; Petersen *et al.* 2008c). The South African coastline is extremely important for seabird conservation, as the Benguela Upwelling System and Aghulhas Bank provide bountiful foraging opportunities (Shannon and Field 1985). In South Africa white-chinned petrels (*Procellaria aequinoctialis*) are most commonly caught and are listed as vulnerable, and three species of endangered albatross are also caught in significant numbers (white-capped *Thalassarche steadi*, black-browed *T. melanophrys*, indian yellow-nosed albatrosses *T. carteri*) (Petersen *et al.* 2008c). Compliance with South Africa's mitigation measures for reducing seabird deaths is still low, and tori-line design specifications are often not met (Petersen *et al.* 2008c). Thus, South African authorities must focus on better enforcement to further reduce seabird mortality.

Discussion

It is concerning that this many seabirds, turtles and sharks are killed annually, as many of these species are endangered (McCord and Zweig 2011). Seabirds, turtles and sharks are K-selected species, as they have conservative life history characteristics. This makes them vulnerable to population declines, even with relatively low catch rates (Gales 1998, Petersen *et al.* 2008d). Mitigation measures have been introduced to reduce these catch rates for seabirds and South Africa's seabird catch rate is now within the globally acceptable range (DAFF 2012). However, no mitigation measures have been prescribed by the South African government to reduce shark and turtle deaths (Petersen *et al.* 2008d).

Dolphin safe labels do not extend to protecting other important sea life; yet it reduces the responsibility that consumers may otherwise feel in relation to overfishing and bycatch (Frisk 2008). The Marine Living Resources Act of 1998 provides "for the conservation of the marine ecosystem" and "the need to protect the ecosystem as a whole, including species which are not targeted for exploitation". If an eco-label is aimed at reflecting the ecosystems approach to fisheries management, which the South African government is prescribing, then

tuna labels must extend beyond being just dolphin friendly. Thus, the dolphin safe label should adopt an ecosystem approach to fisheries management by including seabirds, turtles and sharks in the label.

2.2.2 Badger Friendly Honey Label

Honey badgers (*Mellivora capensis*), as their name suggests, have a close association with honey-bee hives, as they raid these hives, not for the honey, but for the nutritious bee larvae found inside the hive (Irlich and Davies-Mostert 2009). Interestingly, it is only in the 1950s that beekeepers in South Africa began to report damage to hives from honey badgers. It is believed that the conflict between honey badgers and farmers has intensified with loss of suitable habitat to urbanisation, agriculture and the increasing number of beekeepers. Thus cultivated bee-hives may also play a role and honey badgers are well known for their ability to learn, so they may have learnt over the last few decades that beehives provide an easy meal. In the 1990s the problem intensified and beekeepers killed more than 230 honey badgers in the 15 years prior to 2001 (Irlich and Davies-Mostert 2009). Beekeepers persecute badgers directly by shooting them or indirectly by laying out poison and setting traps indiscriminately for black-backed jackal (*Canis mesomelas*), caracal (*Felis caracal*) and honey badgers (Irlich and Davies-Mostert 2009).

A study by Begg (2001) found that beekeepers face a number of challenges which have resulted in the number of active beekeepers and hives dropping in recent years. The biggest threat to beekeepers is the continued loss of foraging habitat for bees due to urbanisation, pollution and widespread use of pesticides. The eradication of alien invasive gum trees further reduces the forage available. In addition to this, vandalism and theft, pests and diseases such as the parasitic mite (*Varroa destructor*) and an outbreak of American Foul Brood, and honey badgers threaten the livelihoods of beekeepers. In 2001 it was estimated that the damage caused by honey badgers in the Western Cape and Mpumalanga amounted to R500 000 annually. With such significant losses beekeepers felt desperate and persecuted honey badgers (Begg 2001).

Begg (2001) saw an opportunity to reduce the conflict between honey badgers and beekeepers by designing a bee hive that would not be vulnerable to damage by honey badgers. The best design was to make sure that the beehive box was in good condition and then raise it up on a one metre platform where badgers could not reach it or, alternatively, to

strap the hive box down to the floor so that badgers cannot roll it around to break it open. Beekeepers were introduced to the design and were encouraged to adopt it, so that they could register for the badger friendly honey label.

The badger friendly honey label was created in 2003 by the Endangered Wildlife Trust (EWT) as an incentive for beekeepers to gain a competitive advantage in the market place for being certified as using badger friendly beekeeping practices. The EWT visited 352 beekeepers during the launch period of the project to make them aware of the initiative, and within two years 420 beekeepers had signed up to the programme. Beekeepers can be certified as being badger friendly through applying for an audit by filling out forms about their beekeeping practices on the EWT website. This audit was initially carried out at no cost to the beekeeper, but a nominal fee is now charged to make the programme more financially sustainable. Once certified as a badger friendly honey producer the beekeeper can order stickers which are sold at a very low cost to apply to his products (Irlich and Davies-Mostert 2009).

Over the course of the badger friendly project it became evident that beekeepers could easily upgrade their beehives at a low cost. A beekeeper may use any materials available to them to raise the beehive on a platform or strap it to the floor. Once the beehive has been fitted to a platform or secured to the floor, badger damage is reduced from 23% to 1%. The cost to upgrade a beehive to be badger friendly varies between R1 and R150. Likewise, it has been shown that badger friendly practices are economically superior, as they reduce the risk of damage to hives by more than just honey badgers. For example, raising the hives helps protect against theft and vandals as the perpetrators can be seen from a distance, and also protects against fire damage. Strapping hives also prevents people with the wrong equipment from opening the hives and also protects against baboons. Placing a greased tin at the base of a raised hive prevents ants from getting to the hives (Irlich and Davies-Mostert 2009).

In the first six years of the badger friendly honey initiative 608 tonnes of honey were sold bearing the label. This averages to roughly 100 tonnes per year but is only a small fraction of honey sales, as South Africa produces approximately 1500 to 2000 tonnes of honey per year (Irlich and Davies-Mostert 2009).

Some beekeepers have chosen to add their own badger friendly information to their products instead of using the label or certification created by EWT. It is important to note that these “independent” labels have not been audited or verified by a third party (Irlich and Davies-

Mostert 2009). However, it is likely that these beekeepers have installed badger-proof beehives, as this is a low-cost input that would provide an overall benefit to their beekeeping operations.

The EWT considers the badger friendly honey label project to be a success. Many beekeepers are protecting their beehives effectively against honey badgers, even if they are not using the badger friendly honey label. Since the start of the programme, the killing of only one honey badger has been reported, although this number is likely to be higher, as there is little transparency within the beekeeping community. Still, there has been no noticeable change in the distribution of honey badgers, so it can be assumed that the population number of honey badgers has stabilized (Irlich and Davies-Mostert 2009).

Discussion

It is my perception that the badger friendly honey label is a sterling example of an eco-label, as this label is accessible to beekeepers at a low cost (both in certification and in upgrading beehives to be badger proof), and it provides a simple yet effective solution for preventing human-wildlife conflict. An area in which the badger friendly honey label can improve is public engagement. Honey badgers are charismatic characters which people are often drawn to once they learn more about this mammal. The EWT should consider playing up to this image to improve awareness of the badger friendly honey label. For example, the caretakers of "Stoffel", a famous Houdini-like honey badger residing at Mohololoholo Wildlife Rehabilitation Centre, could be approached to advertise the badger friendly honey label, as audiences are more likely to connect with this eco-label then (Jones 2014). The badger friendly honey programme runs on a sustainable model and should be supported more by consumers.

2.2.3 GMO-free

Genetically modified organisms (GMOs), also known as transgenic organisms, are the centre of much debate concerning biotechnology in the public and scientific domain. A GMO is created through genetic engineering where an organism's genetic makeup is manipulated by introducing or eliminating certain genes through modern molecular biotechnologies (Verma 2013). The genes used are naturally occurring as raw materials in other organisms, thus the

maintenance of biodiversity to ensure that future beneficial combinations can be made is empirical (FAO 2001).

Many types of genetically modified organisms exist. In fact, all life forms can be genetically altered, whether it be bacteria, plants or animals (FAO 2001). The most commonly discussed GMOs are generally plants, which are being optimised for modern agriculture. The genetic material of crops is altered to acquire useful quality attributes such as herbicide tolerance, insect resistance, abiotic stress tolerance, disease resistance, high yield potential, high nutritional quality, delayed ripening and male sterility (Verma 2013).

GMOs have been permitted in South Africa since 1992. The GM plant products that are currently approved under the Genetically Modified Organisms Act no. 15 of 1997 in South Africa are maize, cotton, imported canola oil, and soya (DTI 2013). The majority of this produce in South Africa is genetically modified as 100% of cottonseed, 90% of soya bean, and 80% of maize is GM (Lim Tung 2013). This makes South Africa the current leading exporter of GMOs in Africa (Lim Tung 2013).

Despite the positive attributes associated with GMOs critics and the public have raised concerns involving the health, ethical, socioeconomic and environmental effects that these GM crops may pose (Verma 2013). For the purpose of this chapter the environmental effects of GMO crops in agriculture will be explored.

Possible negative environmental effects of GMOs

There are many concerns relating to the environmental impact of GM plants and with much misinformation being published, it is often difficult for the public to separate the truth from misinformation (Verma 2013). The major environmental concerns relating to GM plants are clarified below.

Transgene escape to wild-type plants

The wind pollination, biotic pollination or seed dispersal of GM plants could result in these plants hybridizing with sexually compatible wild-type species. The resulting hybrids and their progeny could have an environmental impact (Latifah 2002; Conner *et al*. 2003; Verma 2013). However, effective pollen transfer is unlikely, and to further reduce this risk

microbiologists have utilised knowledge that will prevent transgenes being transferred to wild-type plants via pollen (Verma 2013; Day and Goldschimdt-Clermont 2011).

Creating a generation of superweeds

The concern that gene flow between GM plants and weedy relatives could create a hybrid with a selective advantage and lead to a generation of "superweeds" has been raised (Hansen *et al.* 2001; Verma 2013). Nevertheless, the addition of one gene is unlikely to cause a crop to become a weed. Yet, if a successful hybrid did form, it would be unlikely to have a competitive advantage outside of agricultural areas (Senior and Dale 2002; Verma 2013).

Development of tolerance to target herbicide

A serious environmental threat is that weeds surrounding herbicide-tolerant GM plants will become resistant to herbicides due to the overuse of the same herbicide in the same area to remove weeds (James *et al.* 1998; Verma 2013). A cumulative impact of this may require farmers to use less environmentally friendly and possibly outdated herbicides (Benbrook 2012).

Insect Pests potentially developing resistance to pesticides

As the use of disease-resistant GM plants becomes more widespread, there is a potential for several insect species to evolve resistance to pesticides (Dove 2001; Verma 2013). At this point there is no reported evidence of insects that are resistant to *Bt* crops (Alstad and Andow 1995). If insects became resistant to *Bt* crops, farmers may need to resort to less environmentally acceptable chemical pesticides. Thus, appropriate insect resistance management strategies are essential (Verma 2013).

Harm to non-target organisms

It is not only pests that are affected by GM crops, but "friendly" organisms are negatively affected by the GM plants too (Pimentel and Raven 2000). The non-target effect is not only a problem with GM plants but in other commercial agriculture too, as the conventional insecticides, which are sprayed onto crops kill non-target species too (FAO 2001). Non-target

organisms are also exposed to toxins to a far lesser extent when they are produced within plant tissues, instead of toxins being sprayed over agricultural land (Pimentel and Raven 2000).

Loss of biodiversity

Agriculture has long been a cause of the loss of biodiversity. GM plants will only intensify this as the development of GM agriculture favours monocultures, i.e. plants of a single kind with little genetic diversity (James *et al.* 1998; Verma 2013).

The impact that the above concerns will have on the environment is not fully understood and the impact of these new biological elements, known as GMOs, on ecosystems may take years or even decades to understand. Thus, it is important that all aspects of GMOs are strictly regulated (FAO 2001).

GMO Labelling

Around the world governments have created labelling policies and procedures for GMO products that vary substantially. This disjuncture between countries, along with farm-to-consumer labelling protocols, creates insurmountable challenges for countries of limited capacity wanting to earn an income on international markets (FAO 2001).

In South Africa, GMO labelling standards fall under the Consumer Protection Act (CPA) (Lim Tung 2013). This is because consumers have the right to information, so that they can make informed choices when deciding whether or not to purchase a product (FAO 2001). In 2008 the Department of Trade and Industry created stricter regulations regarding GM products, stating that any goods that are produced, supplied, imported, or packaged must be labelled to disclose the presence of any GM ingredients in the product (Section 24(6) of the CPA 2008, Act no. 68 of 2008) (Lim Tung 2013). In 2011 regulation 7 in terms of section 120(1) of the CPA, which provides the thresholds that must be applied when labelling GM products, was adopted. If a product contains more than 5% GMOs then it must be labelled as "contains GMOs", if the product contains between 1% and 5% GMOs then it is voluntary as to whether the producer would like to disclose that the product contains GMOs, and if the product contains less than 1% GMOs it may be labelled as "GMO-free" or "does not contain GMOs" (DTI 2013). In circumstances where it can be argued that testing the GMO

percentage of the product is scientifically impractical, the product must be labelled as “may contain GMOs” (DTI 2013; Lim Tung 2013).

Discussion

Both GMO food crops and conventional agriculture pose environmental risks. The South African government has allowed GMOs to be grown in South Africa since 1992 (DTI 2013). Consequently, the majority of produce in South Africa is genetically modified. Consumer rights to information are protected through the legislation relevant to GMO products (Lim Tung 2013). However, some consumers may feel that the thresholds in place for reporting GMOs are not sufficient, as a product labelled as GMO-free may still contain up to 1% genetically modified material (DTI 2013). It is possible that the legislation regarding GMO labelling may be updated in future to rectify this if GMO testing of products becomes more practical.

2.2.4 “Natural”

“Natural” is defined by the Oxford Dictionary (2015) as “existing in or derived from nature; not made or caused by humankind” and in relation to food it is defined as “having had a minimum of processing or preservative treatment”. As a marketing strategy food companies sometimes label their products as “natural” as this very broad term creates the idea that their food is healthier or organic. However, the term is far-reaching and regularly has no conditions to support the claim (Aarset *et al.* 2004).

In South Africa the Department of Health followed the lead of the World Health Organisation and passed the R461 Act, which came into effect in 2012 (IFT 2012). This act regulates food manufacturers from including misleading information in their nutritional labelling. The act prohibits the use of ambiguous words such as “natural”, “traditional”, “pure”, “homemade”, etc. on packaging, unless the products are compliant with the United Kingdom Food Standards Agency (FSA) criteria (Department of Health 2014). However, if the product does adhere to the United Kingdom FSA criteria, then it may be labelled with the word “natural”. The criteria for this allowance are essentially that the food product must not have chemicals added to it during the minimal processing that is only done to make the product fit for human consumption (e.g. smoking or fermentation) (Department of Health 2014).

The use of the term “natural” on food packaging is misleading, as consumers often confuse the term “natural” with “organic” (Aarset *et al.* 2004). Thus, it would be best for regulators to ban the use of the word natural, as this would protect consumers and their right to accurate information in relation to the products they purchase.

2.2.5 Free-range

A wide variety of animal products are labelled free-range. The term “free-range” is most commonly associated with chickens due to ethical issues pertaining to the conditions in which chickens are conventionally factory-farmed. The widespread use of battery cages for the mass husbandry of chickens attracted the attention of animal welfare groups in the 1960s (Buller and Roe 2014). Yet, these battery cages are still used on a global scale today, despite the knowledge that this method of keeping chickens is extremely deleterious to their welfare. Chickens kept in these cages are unable to stand upright in an alert position and cannot turn around due to a lack of space (Fraser *et al.* 2001). The floor space of commercial cages is typically 450cm^2 (Duncan 2004). This severe space restriction violates one of the chickens’ five freedoms, related to animal welfare, as chickens cannot express normal behaviour. Chickens are prevented from grooming, wing flapping, stretching, dust bathing, expressing social behaviour and nest construction. The barren cages have wire floors and provide no opportunity for egg-laying hens to build a nest, and this inability to perform pre-laying behaviour is considered to be one of the most important welfare issues for hens in cages. The wire floors also regularly result in foot injuries, and caged birds regularly develop osteoporosis due to the poor living conditions, which can result in bone breakage and chronic pain (Webster 2005).

Legislation has not banned these poor farming practices. Thus, many chicken farmers have decided to farm chickens in a “free-range” style. The farmers who do so place free-range labels on their egg and poultry products. The Agricultural Standards Act (1990) was updated in 2011 to define free-range in the context of eggs. This legislation states that for eggs to be labelled as free-range the chickens must have continuous daytime access to open air runs for at least 6 hours per day; open air runs must be mainly covered with vegetation where poultry are able to scratch and dust bath and must be big enough to allow for ample running space. The chickens must not be caged and must have access to the run through openings in the side of the barn. There has been criticism that the legislation for free-range is too vague. It is the

responsibility of supermarkets to audit the poultry products in their supply chain and determine if the chickens were truly free-range (Child 2014).

Livestock

Livestock other than chickens are not mentioned in the Agricultural Standards Act when defining free-range. Nevertheless, attention needs to be paid to the animal welfare issues in farming cows, pigs and sheep.

In recent decades industrial agriculture has progressively separated animals from the land. More animals are being kept together in smaller spaces, hence the term "factory farming" is used. Factory farming has resulted in fewer farmers and an increased number of animals per farm. For example, cattle previously roamed free to eat grass and their manure helped to increase soil fertility, but with factory farming cattle are kept in feedlots where they are fed grain and the build-up of their manure causes soil and water pollution (Horrigan *et al.* 2002). Feedlot operators argue that they are environmentally friendly, as factory farms use less land (South African Feedlot Association 2014). However, this argument blatantly disregards the environmental impacts of the intensive monoculture practices used to grow grain to feed the cattle. Moreover, 37% of the world's grain production is fed to livestock. Thus, cattle in feedlots have a greater negative impact on the environment than well-managed free-range cattle do (Horrigan *et al.* 2002). Free-range cattle may have positive environmental effects as studies have shown that moderately grazed land (one cow per 6,5 hectares) had more biodiversity than ungrazed or overgrazed land (Comis 1999).

The crowded conditions and production practices in pig and cattle factory farms raise ethical concerns about the poor welfare of these animals. Consequently, the environmental and animal welfare concerns related to factory farming make it alarming that approximately 75% of all beef produced in South Africa is from the feedlot industry, and almost all pork is from factory farmed pigs (South African Feedlot Association 2014; Woolworths 2012). Certain supermarkets do stock free-range beef and free-range pork on a small scale. It is significant to note that an increased demand for free-range products from consumers would result in supermarkets placing pressure on farmers to convert to the use of free-range practices. Mutton and lamb in South Africa can be labelled as free-range by various labelling initiatives, as the majority of sheep in South Africa are kept in free-range settings (Botes 2013). These products are labelled as free-range through the supermarkets' own auditing

process, as there are currently no legal regulations on free-range for any livestock other than chickens.

Discussion

The term free-range is commonly associated with chickens. However, the Agricultural Standards Act (1990) only provides guidelines for how egg laying chickens must be kept to qualify as free-range. This legislation is vague and does not guarantee better welfare for the egg laying chicken. Strikingly, poultry (for meat), cows, pigs and sheep are not mentioned in the legislation pertaining to free-range products. Thus, from a legal perspective a product does not need to meet a specific standard to be labelled as free-range. Furthermore, the responsibility for auditing whether a farming operation has free-range livestock falls on the supermarket (Child 2014). This responsibility may not be a priority for all supermarkets, or the supermarket may not have the systems in place to perform audits of all their animal product suppliers. Consequently, the labelling standards and legislation for free-range need to be vastly improved to ensure animal welfare.

2.2.6 "Organic"

Benefits of organic farming

The use of synthetic fertilisers and pesticides in conventional agriculture is a major problem, as they diminish soil fertility and lead to soil erosion and groundwater pollution (Horrigan *et al.* 2002). In an attempt to prevent this, the use of synthetic fertilisers and pesticides is prohibited in organic agriculture. The use of organic composts, e.g. manure, promotes greater biodiversity and an enhanced soil structure and improves water filtration. These measures greatly reduce the risk of groundwater pollution (United Nations 2008). Organic practices use minimum tillage, cover crops, crop rotations, inter-cropping and symbiotic associations to build soil. This creates more stable soils by supporting soil fauna and flora, which improves soil formation and structure (Rahmann 2011). Furthermore, nutrient and energy cycling are enhanced and over time the soil's ability to retain water and nutrients increases. Overall, these techniques help to prevent soil erosion and increase soil fertility (United Nations 2008).

Conventional agriculture generally has a negative effect on biodiversity. The monocropping used in conventional agriculture promotes insect pests and plant disease in susceptible crop

varieties, through planting of the same species contiguously in the same area in great volumes. Monocropping also reduces biodiversity as it replaces diverse habitats. The use of pesticides reduces biodiversity by killing beneficial species such as pollinators and other non-target organisms. Additionally, the excessive fertilizer use affects nitrogen runoff and thus ecosystem balance. Only a minority of species can thrive in high nitrogen environments and these organisms sometimes crowd out all other species in an environment. Organic farming strives to be an ecologically friendly way of preserving biodiversity and ensuring food security. A 2011 study reviewed 766 scientific papers on organic farming and found that organic farming supports higher biodiversity than conventional farming (Rahmann 2011). This high level of biodiversity is achieved on three levels, the genetic, species and ecosystem level. On the gene level traditional and adapted breeds of seeds are preferred, as the genetic diversity amongst these seeds offers greater resistance against disease and resilience to climatic stress. On the species level nutrient and energy cycling are optimised by combining a wide variety of plant and animal species in an area. Lastly, on the ecosystem level, the absence of chemical inputs creates suitable habitats for wildlife. For example, not using pesticides attracts beneficial organisms such as pollinators and pest-predators to the site (FAO 2014).

The artificial fertilisers and pesticides used in conventional agriculture not only require large quantities of fossil fuels to be produced, but also damage topsoil, thereby hampering the ability of the soil to sequester carbon, whereas organic agriculture uses techniques such as minimum tillage and returning crop residues to the soil to promote increased carbon storage in the soil (Horrigan *et al.* 2002). Evidence for this can be referenced through multiple studies which reveal that soil organic carbon contents is significantly higher under organic farming practices. However, there is considerable research needed in this field to determine how large an effect organic farming can have on carbon sequestration. This research is very important with regard to air quality and climate change (FAO 2014).

Organic agriculture does not permit the use of GMOs. This takes a precautionary approach to prevent any negative effects that may be caused by GMOs (FAO 2014). In comparison, the majority of maize, soy and cotton crops in conventional agriculture are produced using GM seeds (see GMO-Free section earlier in chapter 3 for the environmental effects of GMOs) (Lim Tung 2013).

Negative aspects of organic farming

Organic farming practices are generally perceived to have beneficial impacts on the environment in comparison to conventional agriculture (Gracia and de Magistris 2008). However, meta-analyses in multiple studies have found that there are many challenges in organic farming that have negative environmental impacts. Studies have found that organic farming generally has positive impacts on the environment per unit area but not per product unit (Mondelaers *et al.* 2009; Tuomisto *et al.* 2012; Matthias *et al.* 2014).

Life Cycle Assessments (LCAs) are a tool for measuring the impact of products using a holistic approach, which allows consumers to compare the environmental impacts of different products. Thus, LCAs are based on "per product unit" and not "per unit area" of land. Therefore, the findings from comparing numerous organic and conventional farming studies, which indicate that organic farming may have worse impacts per product unit, are worrying. The problematic aspects of organic farming relate to nitrogen (N) fluxes influencing acidification, eutrophication, global warming potential and biodiversity. The results from the meta-analysis of these factors vary widely, and the authors warn that it is not yet possible to draw a conclusive picture of the general environmental performance of the different farming systems. The variation in results may be attributed to different types of farming occurring in different regions which have varying conditions, and to inadequate modelling techniques for the different systems (Mondelaers *et al.* 2009; Tuomisto *et al.* 2012; Matthias *et al.* 2014).

A drawback to organic farming is that it produces a lower product yield per area of land than conventional farming. Considering global population growth and the need for increased food production, this is problematic. Furthermore, this highlights the importance of measuring environmental impacts per unit of production rather than of area. The core reasons for low yields in organic farming are problems with pests, diseases, weeds and soil nutrient deficiencies (Köpke *et al.* 2008). Thus, research to improve these complications is needed in addition to breeding crops and animals that are more suited to organic farming, as traditionally breeding has been aimed at conventional farming systems (Wolfe *et al.* 2008).

Discussion

It is clear that there are many positive aspects to organic farming practices but that there are also negative factors to consider when purchasing food products. There are many trustworthy

organic labelling initiatives in South Africa which consumers can support if they wish to. Yet, consumers must be careful not to mistake misleading terms, such as “ecological”, “green”, “environmental”, “sustainable” and “natural”, for “organic” (Aarset *et al.* 2004). Other eco-labelling initiatives, such as Fairtrade, that follow a more integrated farming approach are also worthwhile to support. Integrated farming uses conventional farming systems but with best practice techniques, e.g. reduced use of fertilisers and pesticides. Studies have shown that integrated farming often produces higher yields and the lowest environmental impacts (Basset-Mens and van der Werf 2005; Torstensson *et al.* 2006; Korsaeth 2008). Thus, environmental benefits may be optimised by combining the principles of organic and conventional farming systems using integrated farming. Essentially, agricultural policies need to recognise and address the complexity of organic and conventional agriculture in terms of the costs and benefits to environmental and social systems (Tuomisto *et al.* 2012). Policy makers can then encourage the use of integrated farming practices.

2.3 Conclusion

The environmental issues being addressed by “Dolphin Safe Tuna”, “Badger Friendly Honey”, “Natural”, “GMO-free”, “Free-Range” and “Organic” are very complex. These eco-labelling terms attempt to simplify the complexity of the eco-labels associated environmental issues for consumers. However, these overly simplified labels result in a lack of information for consumers to make informed choices. Eco-labelled products should include a brief description of the eco-labels’ relevance to the product and a web link to a site where consumers can read up more about the history of and reason for the eco-label. Consumers who are interested would then be able to understand the environmental issues that the eco-label addresses more clearly. Thus, consumers may be more motivated to purchase an eco-labelled product, as they will understand the benefits of supporting this product. Furthermore, the amount of effort required for consumers to understand the eco-label and the environmental issues related to it will be significantly reduced, so consumers will be more likely to understand the label.

CHAPTER 3: COMMON ECO-LABELS IN SOUTH AFRICA AND THE ENVIRONMENTAL RELIABILITY OF ECO-LABEL STANDARDS

3.1 Introduction

The goal of eco-labelling initiatives is to create more sustainable products by promoting social and environmental justice (Oyewole 2001; Zaman *et al.* 2010). For this goal to be achieved it is vital that eco-labelling programmes are monitored to determine whether the program is benefitting the environment more than the equivalent regular products. Eco-labelled products need to be well regulated to build and maintain consumer trust (Hamilton and Zilberman 2006). Thus, third party certification bodies must create appropriate, practical and robust standards which are manageable for farmers to implement and for the certification body to monitor (Ponte 2007). From here, retailers and consumers should ideally take an active approach in finding out more about the products they purchase.

An eco-label certification body is a non-governmental organisation which audits and accredits producers against legal requirements or against standards that have been created by the certification body. Many eco-label certification bodies are affiliated to larger, well established accreditation organisations, such as the International Federation of Organic Agriculture Movements (IFOAM), to improve the credibility and consumer trust of the label. The certification bodies often operate at both a local and international level, as this allows for global trade of products carrying the eco-label. If a food producer wishes to carry an eco-label, they must apply to the relevant certification body. A representative from the certification body will then visit the food producer and audit their practices against the standards of the certification body. If eco-label certification is awarded to the food producer, an annual audit by the certification body will usually be required for the food producer to maintain its eco-label status (Siderer *et al.* 2005). Examples of established certification bodies in South Africa are Fairtrade, the Marine Stewardship Council (MSC) and UTZ certified.

The current pressure placed on businesses to become “green” may be seen as a burden by retailers. However, third party certified eco-labelled products are an easy way for retailers to “green” their product range. Since these products are certified for having better practices, retailers can benefit from the low effort required to source eco-labelled products (Seuring and Müller 2008). Alternatively, retailers need to carry out life cycle assessments to determine a

product's history and this is a very high effort endeavour (Naumann 2001). Moreover, retailers need to recognise the important role that their stores play in promoting better agricultural practices. Large supermarkets are the middleman between the farmer and town and city inhabitants. Thus, consumers rely on the supermarket to make important decisions on which suppliers they will source their produce from. Customers expect large supermarkets to source ethical food. This creates an obligation for supermarkets to put effort into sourcing food products that have been produced in a more responsible way if the supermarket wishes to be competitive or if sustainability is one of the supermarkets aims (Golden 2010).

Many of the major retailers in South Africa have a sustainability department which aim to enhance the positive social and environmental impacts of these businesses (Haw *pers. comm.*). It is unclear whether these sustainability departments should take an interest in eco-labelled food products, even though eco-labels have the potential to improve the transparency of the retail chains product procurement (Seuring and Müller 2008; Golden 2010).

The intention of this chapter was to establish which eco-labels are stocked most commonly by major supermarkets in South Africa to fulfil objective two. Objective two requires that the seven most common eco-labels currently used in South Africa are identified. The environmental reliability of these eco-labels was then investigated by reviewing the certification bodies of the eco-labels, in line with objective three. Lastly, objective four was completed as the availability of these eco-labels to consumers was considered.

3.2 Accreditation bodies of selected eco-labels in South Africa

To assess the quality of the third-party certified eco-labels a literature review was carried out. To evaluate the quality of in-house eco-labels I requested that the supermarket provide me with the standards that are used for their eco-labels, and a literature review was carried out for these eco-labels too. The literature reviews incorporated peer reviewed journals, the websites of the certification authorities and online newspaper and magazine articles. This data was collected in the period of September 2013 to December 2014.

Further investigation into what the certified eco-labels in South Africa represent revealed that Afrisco, Eco-cert and CCPB were affiliated to the International Federation of Organic Agriculture Movements (IFOAM), while Fairtrade, UTZ certified and MSC were affiliated to the ISEAL (International Social and Environmental Accreditation and labelling) alliance. It

was decided that, rather than investigating the standards of each of these eco-labels, a review of IFOAM and the ISEAL alliance would be conducted, as this would provide sufficient information about these labels for the purpose of this study. The in-house label, "Farming for the Future", was also reviewed as this label is found at a major supermarket throughout the country. In addition to this the Biodiversity and Wine initiative, and the Integrated Production of Wine Programme are considered as these labels are found on many South African wines, including wines for export.

3.2.1 IFOAM (International Federation of Organic Agriculture Movements)

The International Federation of Organic Agriculture Movements (IFOAM) was established in 1972 and today advocates for organic agriculture at a world-wide and intergovernmental level. Increasing global trade and the expansion of organic agriculture create two major concerns: that the values and motives for organic farming may not be sustained, and that there is a lack of transparency as distant trade makes produce more anonymous (Woodward *et al.* 1996; Alrøe *et al.* 2006). Consequently, IFOAM took up the challenge of connecting the values of the founders of the organic movement and the current developments towards globalisation of organic agriculture. The standards set by IFOAM can be thought of as "standards for standards", as organic agriculture has site-specific characteristics and IFOAM engages with organic farmers on a world-wide level. Therefore, IFOAM has set the IFOAM Basic Standards (IBS), to provide a framework which organic farming co-operatives and certification bodies can use to set their standards (Corsin *et al.* 2007). For a certification body to receive accreditation from IFOAM they must apply to the International Organic Accreditation Service (IOAS), an independent non-profit organisation. The certification body will be awarded with IFOAM accreditation by IOAS once it complies with IFOAM's basic standards. The accreditation is renewed annually through a surveillance system which includes yearly visits to the office of the certification body (Luttikholt 2007).

IFOAM engaged with stakeholders for two years, between 2003 and 2005, to revise the IBS in a participatory manner, which discussed and reflected on the basic foundation of organic agriculture. Care was taken to engage with consultative groups around the world who were diverse in gender, background, region and history of the organic movement. The principles were formulated to include thoughts on the organic movement globally and none of the regional views dominated the principles. To ensure transparency IFOAM made all of the

internal and external feedback and the responses of their members publicly available. Furthermore, the principles were translated into 10 languages to make them more accessible. The principles resulting from this rigorous process are less prescriptive and are instead truly basic, so as to promote innovativeness and an organic guarantee system that will be accessible to certifiers around the world. The basic nature of these principles is vital for creating fair competition and access to markets (Corsin *et al.* 2007; Luttikholt 2007).

Afrisco

Established in 2001, Afrisco is Southern Africa's first internationally accredited organic certifier. Afrisco is associated to Eco-cert and has been accredited by IFOAM. Afrisco products comply with international organic standards, and can be exported to the European Union, north America (Canada and the United States), and Switzerland. Afrisco acknowledges that farms cannot become organic overnight. Thus, two types of labels can be awarded to farmers, the Afrisco "certified organic" logo or the Afrisco "organic in conversion" logo. Afrisco provides organic certification to a variety of crop and livestock products. Both large commercial farms and smallholder groups are able to apply for organic certification from Afrisco (Afrisco 2015).

Ecocert

Ecocert Pty Ltd is an inspection and certification body which has been operating in South Africa since 2002. The Ecocert group was originally established in France in 1991, and has since expanded its range to help clients make the most of their certification. The South African Ecocert office is responsible for certification in seven countries Southern Africa and is accredited by IFOAM. Ecocert offers organic inspection services for six different international standards bodies, such as European Union Organic Regulations (Ecocert 2015).

CCPB

CCPB is an inspection and certification body for agricultural food and "no food" products obtained through organic and eco-friendly production. CCPB inspects and certifies products against a wide range of reputable standards. CCPB certifies 9000 companies, ranging from

big retailers to start-ups. CCPB is based in Bologna, Italy and is accredited by IFOAM (CCPB 2015).

3.2.2 ISEAL alliance

The ISEAL alliance is an association of certification and accreditation organisations that leads the world in standard setting focused on environmental and social issues (Corsin *et al.* 2007). The ISEAL Code of Good Practice was developed to help improve the quality of standard setting processes by instituting objective criteria for standard setting. The ISEAL alliance assists members in continuously improving their programmes by providing capacity building tools, policy monitoring and analysis, peer review and a common platform for collaboration. The following well-respected organisations are all full members of the ISEAL alliance: IFOAM, Fairtrade Labelling Organisations (FLO), Marine Stewardship Council (MSC) and the Forest Stewardship Council (FSC) (Will and Guenther 2007).

ISEAL members agree that the 'traditional' auditing practices developed by International Organization for Standardisation (ISO) are not sufficient for certified sustainability, and believe that the ISO standards are inappropriate for capturing the value of social justice and environmental conservation. ISEAL has thus created innovative standards which are 'fit for purpose' in an attempt to fairly value social justice and environmental conservation (Borrás and Edler 2014).

A concern regarding ISEAL is achieving a balance between standards that are accessible to all and standards that are rigorous enough to maintain credibility (Borrás and Edler 2014). For example, Derkx (2011) found that ISEAL accredited members performed poorly when evaluated against ISO-based accreditation audits. However, ISEAL argued that this is because of the realities of where these organisations work and not because of incompetence (Borrás and Edler 2014).

Fairtrade

The Fairtrade Label South Africa was established in 2009, although the general Fairtrade label was first launched in 1988. Fairtrade is considered as an ethical certification which aims to promote equality and sustainability in the farming sector. The Fairtrade standards focus on

improving living conditions and labour practices in the farming community, and using more environmentally friendly farming practices. Fairtrade Label South Africa is accredited by ISEAL (Fairtrade 2015a).

UTZ Certified

The word "UTZ" originates from the Mayan language and can be translated to "good" in English. UTZ certified was launched onto the market in 2002 and aims to improve labour conditions, agricultural practices, and operational management, to create better living and environmental conditions in agricultural communities. UTZ certified is focused on coffee, cocoa and tea farming only. The UTZ certified standards are fully accredited by the ISEAL alliance (UTZ Certified 2015a).

MSC

The Marine Stewardship Council (MSC) is an independent certification body which promotes sustainable fishing practices. MSC collaborates with fishers, retailers, processors and consumers to drive change. The MSC standards were developed through consultation with the fishing industry, scientists, conservation groups, experts and stakeholders and are accredited by the ISEAL alliance. MSC is focussed on the sustainability of wild-capture fisheries (MSC 2015).

3.2.3 Farming for the Future

Woolworths created an in-house eco-label called Farming for the Future which was implemented in 2009. The farmers who have received the Farming for the Future label are "reducing dependence on synthetic fertilisers, herbicides and pesticides". Woolworths covers the cost for Enviroscientific to audit farmers against the Farming for the Future standards. In addition to this, technical advisory and training is provided to farmers who participate in the Farming for the Future programme (King and Thobela 2014). Each supplier in the Farming for the Future programme begins with a baseline audit and must then improve their score annually. This ensures continuous improvement from the supplier in terms of sustainable practices (Van Rooyen 2013; King and Thobela 2014). WWF-SA provided scientific

expertise to Woolworths when the Farming for the Future label was created, and has since provided guidance on adapting and up-scaling the programme (King and Thobela 2014).

Woolworths has worked with the WWF to create a Farming for the Future dairy label which focuses on water, waste and carbon footprint management (Joubert 2012; Woolworths 2014). All of the wines stocked by Woolworths carry Farming for the Future labels. The wine makers are audited against the Farming for the Future label standards every three years. These standards are not specified, but the wine farmers are all members of the Biodiversity and Wine Initiative (BWI) and/or the Integrated Production of Wine Programme (IPW) (Woolworths 2014).

3.2.4 Biodiversity and Wine Initiative (BWI)

South Africa's wine growing takes place almost exclusively in the Cape Floral Kingdom (CFK). The CFK is the richest and also the smallest plant kingdom in the world. Threats to the CFK, such as agriculture, urbanisation and invasive alien species, led to the wine industry forming a partnership with the Botanical Society of South Africa, Conservation International and The Green Trust; resulting in the WWF Biodiversity and Wine Initiative. The BWI conserves natural vegetation by asking wine producers to conserve 1 hectare of land for every hectare under vineyard. Since the inception of the programme in 2004, over 140 000 hectares of natural area has been committed to conservation. This exceeds the amount of land used for vineyards, as this only totals to 101 568 hectares. BWI also encourages wine producers to farm sustainably. The BWI is a world leader in its business model which promotes environmental sustainability (WWF 2014).

3.2.5 Integrated Production of Wine Programme (IPW)

The Integrated Production of Wine Programme was established in 1998 and is a voluntary environmental sustainability scheme. The IPW complies with various international wine industry environmental sustainability criteria. IPW monitors and regulates the environmental sustainability of wine production from the farming practices in the vineyard, to processing and packaging of the wine (IPW 2014).

3.3 Methodology

To determine which eco-labels are stocked in major supermarkets in South Africa I visited the outlets of three different supermarket chain stores in northern Johannesburg. These supermarket chain stores were Woolworths, Pick n Pay and Checkers. These supermarket chains represent three of the five main players in the South African food retail market with Woolworths, Pick n Pay and Checkers representing upper, middle and lower economic consumer classes respectively (Naidoo 2011). Three of each of the supermarkets were visited. I also contacted the head office of the supermarkets to request lists of all of the eco-labelled food products that these stores stock. This was done via email correspondence to the head of sustainability of each supermarket.

To evaluate the reliability of eco-labels in providing eco-system support and credibility I examined the policies behind each of the seven most common eco-labels in South Africa. An evaluation of ecosystem support was carried out using a framework developed by Zaman *et al.* (2010). Zaman *et al.* (2010) analysed brands according to the following four criteria: environmental protection from "cradle to grave"; sustainable management of natural resources (if a resource is managed in a way that aims to prevent any degradation to the ecosystem around it); communication with consumers; and transparency within the product supply chain. For the purpose of this study the framework of Zaman *et al.* (2010) was adapted to evaluate ecosystem support. The relatively small scope and time frame for performing a research report only allowed for a superficial analysis of the ecosystem support of the eco-labels in South Africa. It is recommended that future studies undertake a more in depth analysis of this issue. The future studies should carry out an assessment of the level of ecosystem support that label standards promote. For example, an analysis of the amount of pesticide usage allowed, lists of banned substances, how human rights issues are assessed, etc. could be assessed and site visits should be carried out.

To gauge the level of ecosystem support of the eco-labels in South Africa three criteria were used, namely whether the eco-label has explicit environmental management guidelines, whether the guidelines are developed from a credible source, and whether multiple categories relating to the scale / type of food production are included under the labels' umbrella. The credibility of eco-labels was assessed by analysing communication with consumers and the transparency of the label (Table 1).

Table 1: An example of the criteria used when analysing ecosystem support and credibility of eco-labels in South Africa

	Ecosystem support			**Credibility of labels**	
Label	**Explicit environmental management guidelines**	**Guidelines are developed from credible source**	**Multiple categories (scale / type of food production) under labels umbrella**	**Communication with consumers**	**Transparen-cy**
A	Comprehensive and clear guidelines that the food producer must adhere to, to minimise environmental impacts and be considered for the label, are provided.	The environmental management guidelines are created in collaboration/ accordance with a higher level certification body / organisation that is well respected.	A food producer can apply for the label and receive specific environmental management guidelines, irrespective of whether they are a large or small scale food producer. There are a variety of food types that fall under the label, and the environmental issues of each type are addressed.	Effort is placed into communicating with consumers in South Africa about the meaning of the eco-label. There is a website targeted toward South African consumers where they can easily access more information on the label.	The exact standards of the label are easy to access.

The policies and practices of each eco-label were rated according to the level at which the eco-label adhered to the criteria regarding environmental justice, ecosystem support and

credibility of the company. Three levels of adherence were considered, namely fulfilled, partially fulfilled, and not fulfilled. For readability purposes the levels of adherence were represented using smiley faces. For example, fulfilled was represented by a green smiley face, partially fulfilled by a yellow neutral face and not fulfilled by an orange sad face.

3.4 Findings

3.4.1 The eco-labels stocked by supermarkets in South Africa

A general assessment made by looking at the various products stocked demonstrated that Woolworths, followed by Pick n Pay, stock the most eco-labelled products, while Checkers had only a few eco-labels on their shelves (Table 1). Thus, a decision was made to contact only Woolworths and Pick n Pay about the eco-labels that these stores stock.

One of the supermarkets replied with a list of all the eco-labels that they stock; most of these eco-labels were certified by a third party and one was an in-house label (Table 2). When a request to see the standards for the in-house label was made, the supermarket stated that these standards were confidential and could not be released. In addition to this, the supermarket suggested that their annual report be consulted for details of the label.

The other supermarket responded to the email by stating that eco-labels are unfortunately not currently a project focus for the supermarket, and that they do not have specific data on supplier's eco-labels.

Table 2: The most common certified eco-labels found in Woolworths and/or Pick n Pay

Label	Represents	Aim	Affiliation
AFRISCO certified organic	Certified organic (coffee, oils, sugar, fresh produce food, etc.)	Africa's Farms Certified Organic for the South African market and for exports.	IFOAM INTERNATIONAL FEDERATION OF ORGANIC AGRICULTURE MOVEMENTS
ECO CERT®	Certified organic (certifies a large variety of product	A certification body with service offerings that include third party organic inspection and	

	types)	certification, and training.	
	Certified organic (organic agrifood, agrifood, protected geographical indications for wine and food, tourism and food service, cosmetics, textiles)	An inspection and certification body for agrifood products obtained in organic and eco-friendly production.	
	Ethical trade systems (wine, tea, coffee, cotton, chocolate, food)	Focus on improving labour and living conditions for farming communities and on promoting a way of farming that doesn't harm either people or the environment.	ISEAL alliance
	Sustainable farming (cocoa, coffee, tea)	UTZ Certified stands for sustainable farming and better opportunities for farmers, their families and our planet.	
	Sustainable seafood (fish and seafood)	MCS works with partners to transform the world's seafood markets and promote sustainable fishing practices.	
	Sustainable farming (70 different lines of fresh produce)	Woolworths works with farmers using a new approach to growing food sustainably and in Harmony with nature.	In-house label

3.4.3 Environmental reliability of eco-labels

For the most part the eco-labels available in South Africa promote ecosystem support and are credible. The eco-labels which had a high relevance for each criteria were Fairtrade, UTZ certified, MSC and SASSI. The Farming for the Future label was data deficient for each ecosystem support category and this resulted in a low transparency score but the label did have good communication with consumers. Afrisco and Ecocert both had the shortcoming of relevance with gaps in terms of their communication with consumers. CCPB scored no relevance in the communication with consumers category as no evidence of any effort could be found of CCPB attempting to engage with South African consumers (Table 3).

Table 3: The level of ecosystem support and credibility of the eight most commonly found eco-labels in South Africa

	Ecosystem support			Credibility of labels	
Label	**Explicit environment-al management guidelines**	**Guidelines are developed from credible source**	**Multiple categories (scale / type of food production) under labels umbrella**	**Communicati on with consumers**	**Transparen-cy**
AFRISCO certified organic	☺	☺	☺	😐	☺
ECO CERT	☺	☺	☺	☺	☺
ccpb	☺	☺	☺	☹	☺
FAIRTRADE	☺	☺	☺	☺	☺
UTZ CERTIFIED Good inside	☺	☺	☺	☺	☺
CERTIFIED SUSTAINABLE SEAFOOD MSC www.msc.org	☺	☺	☺	☺	☺
SASSI	☺	☺	☺	☺	☺

	Data deficient	Data deficient	Data deficient		

*** - Fulfilled - Partially fulfilled - Not fulfilled

3.5 DISCUSSION

The lack of transparency concerning the Farming for the Future label stocked by the first supermarket was dissatisfying, as consumers should be allowed to access this information. Furthermore, the lack of transparency from the second supermarket was disappointing, as the stores do stock in-house "organic" labels, yet customers do not have access to what this means in terms of product history.

It is important to note that this study only considered the standards of the eco-labels and did not carry out life cycle assessments of these products to determine environmental reliability. Other studies have found that eco-labels often fall short in the supply chain management and cradle-to-grave practices of the product. Thus, the product loses traceability after its initial production phase (Zaman *et al.* 2010). For example, some eco-labels may have a tendency to "over-package" products with paper and plastic film, which is not an adequate expression of environmentally friendly production (Menghi 1997).

Afrisco only fell short in the communication with consumer's category. The Afrisco website was very basic and provided the relevant basic information about the label but it was not user friendly for consumers. Considering that Afrisco is a South African eco-label the organisation should make an effort to increase awareness of this certification programme among consumers (Afrisco 2015).

CCPB scored very poorly in communication with consumers because the organisation has made no effort to increase its presence in South Africa. CCPB has a website in Italian which can be translated to English but it is aimed at a general international market (CCPB 2015). Thus, the lack of targeting any marketing effort toward South Africans produced a poor score.

Ecocert has dedicated a section of their website to the South African Ecocert operations, making it easy for consumers to learn more about the label. Fairtrade has regular press

releases in the South African media about the work that they are doing (Fairtrade 2015b). UTZ Certified recently held a consultation workshop in South Africa with 50 key stakeholder representatives from the Rooibos sector. Additionally, UTZ Certified has a very user friendly website (UTZ Certified 2015b). MSC and SASSI are interconnected through the WWF in South Africa. SASSI is a well marketed initiative in South Africa and the WWF/SASSI website helps advertise MSC products too (SASSI 2010).

Overall the third party certified eco-labels fulfilled the ecosystem support and transparency criteria well, most likely because each of them is accredited by either IFOAM or ISEAL (Will and Guenther 2007). The aspect which the third party certified eco-labels must improve and focus on the most is communication with consumers.

The in-house Farming for the Future label was data deficient in all aspects of ecosystem support, making it difficult to comment on whether the eco-label is likely to have a positive environmental impact. The Farming for the Future label does have good communication with consumers as a general outline of the programme is provided on the products packaging, so many consumers do understand the label (King and Thobela 2014). However, overall the Farming for the Future label lacked transparency.

Eco-labels need to be sold at a large scale in high volumes to make an impact on the way that the food production industry affects the environment (Hamilton and Zilberman 2006). For consumers to have the opportunity to purchase eco-labels in large amounts, they must be readily available. An informal assessment on the availability of eco-labels in Woolworths, Pick n Pay and Checkers was carried out. Due to the informal nature of the assessment, as the data could not be acquired from the supermarkets themselves, the information supplied should be regarded as the author's own observations over the course of this research.

Woolworths and Pick n Pay carry small ranges of organic fresh produce within their stores. Non-perishable foods with eco-labels are most commonly honey, coffee, chocolate and wine. Many free-range options are readily available at Woolworths. Woolworths is the first major supermarket in South Africa to work on improving the living conditions for sow pigs. The programme is called "kinder to sows" and all fresh pork products in Woolworths stores now originate from farms which do not keep pregnant sows in restrictive sow stalls (Woolworths 2014). Free-range options are provided at Pick n Pay and Checkers but are not always consistently available. Seafood sustainability programmes are also endorsed by Woolworths and Pick n Pay, as these supermarkets are working in partnership with the WWF. The WWF

created the Southern African Sustainable Seafood Initiative (SASSI) as an awareness programme for seafood which is being sustainably fished. Woolworths and Pick n Pay have committed to stocking only SASSI approved seafood as time bound goals (Woolworths 2014; WWF 2015).

A large brand supporting and participating in an eco-labelling initiative is Cadbury (Pty) Ltd. Cadbury's Dairy Milk Chocolate plain slab has carried a Fairtrade label since November 2011 in South Africa. This has helped to improve the lives of cocoa producing communities in Africa (Fairtrade 2012). Cadbury's chocolate is sold widely throughout South Africa and is readily available to consumers.

Based on this preliminary research consumers in South Africa do have access to reputable and environmentally sound eco-labelled food products at major supermarkets. The amount, variety and reliability of eco-labels stocked by major supermarkets in South Africa is improving but eco-labelled products still only have a very small market share.

CHAPTER 4: CONSUMER AWARENESS AND UNDERSTANDING OF ECO-LABELS

4.1 Introduction

Eco-labels are a great initiative for differentiating more environmentally friendly food production practices from conventional food production and have the potential to improve the food production industry (Teisl *et al.* 2002; Bleda and Valente 2009). If enough consumers purchase eco-labelled products then it will encourage more farmers and fisherman to improve their practices, so that their products can carry eco-labels too. To achieve these goals eco-labels must stimulate the interest of supermarkets and consumers in more sustainable food production practices. Eco-labels must be fully adopted by a sizeable proportion of consumers to be change agents within the food production industry (Hamilton and Zilberman 2006; Thøgersen *et al.* 2010).

A baseline assessment to assess the degree to which consumers are aware of and understand eco-labels should be performed at any regional level where eco-labelling initiatives wish to improve their sales. Additionally, the factors that influence whether consumers would be motivated to purchase an eco-labelled product should be assessed. From here the marketing campaign of the eco-labelling initiative can be adapted to be more appropriate for the consumers that the eco-label is targeting (Thøgersen *et al.* 2010; Lefébure and Muñoz 2011).

Different regions are likely to have different levels of understanding and awareness of eco-labelled products. For example, European countries have been exposed to eco-labels for a few decades already but the eco-labelling concept is still novel in South Africa (Delmas *et al.* 2012). The eco-labels Fairtrade South Africa, UTZ Certified, Afrisco and SASSI were all launched between 2001 and 2009 (Afrisco 2015; Fairtrade 2015a; SASSI 2015; UTZ Certified 2015a). The duration of time that a community has been exposed to eco-labels could be a very important factor in whether they have fully adopted an eco-label. Thøgersen *et al.* (2010) state that eco-labels are considered to be an innovative product and explain the process that consumers undergo while fully adopting an eco-label. An eco-label is considered to be fully adopted by a consumer when the consumer is aware of, understands, and has purchased the eco-label.

Eco-labels were first introduced in European countries, such as Sweden, for public health reasons. For instance, knowledge about the potential ill health effects of pesticides that emerged in the 1960s increased the demand for products labelled as “organic”. In the years since, eco-labels have progressed from being focused only on personal health issues to also focusing on environmental and labour issues (Golden 2010). In contrast, it can be argued that the eco-labels were introduced into South Africa for environmental sustainability reasons (Naumann 2001).

Eco-labels started to become widespread in the South African market in the 2000s. The increase in the availability of eco-labelled food products is most likely related to South Africa’s move towards a green economy (Naumann 2001; Economic Development Department 2011). Eco-labelled products have a place in the green economy, as they are an accessible way for sustainable development to be promoted in the food production industry. Additionally, a niche market of consumers are becoming more aware of the environmental effects of the food production industry and are encouraging supermarkets to stock eco-labelled products (Golden 2010).

A few generic eco-labelling terms were defined in the South African context in Chapter 2 and the credibility of eco-labelling initiatives was explored in Chapter 3. These analyses demonstrated that there are a generous number of credible eco-labels in South Africa. Thus, it is only fitting to determine whether South African consumers are aware of the meaning of eco-food labels and whether they would prefer to buy sustainable food products in. This will establish how the public perceives eco-labelled food products in South Africa, and suggest how eco-labelling programmes can be improved to increase the demand for eco-labelled products and sustainable food production.

A focus of the literature review at the start of this project was to search for studies that surveyed consumers on awareness and understanding of consumers. A very relevant study conducted with Swedish consumers was found (Lefébure and Muñoz 2011). To evaluate whether South African consumers are aware of the meaning of eco-food labels and whether they would prefer to buy sustainable food products I followed the methods of the study conducted with Swedish consumers closely (Lefébure and Muñoz 2011). The results from the South African consumers could then be compared to the data gathered from Swedish consumers. Consequently, a comparison was made between a first world country and a developing country, in terms of consumer attitudes to eco-labels.

4.2 Methods

A comprehensive questionnaire was used to determine whether South Africans living in Northern Johannesburg understand the meaning of eco-labels. This questionnaire was compiled in accordance with the University's Human (non-medical) Ethics Screening Committee's code of ethics and received full ethical clearance (University of the Witwatersrand 2014, REF.: H14/04/26). The data collected on the eco-labels sold in major supermarkets (see chapter 2) were used to determine the four most common eco-labels in South Africa. These four eco-labels were FairTrade (an ethical trading label), Afrisco (an African organic certification label), FSC (a sustainable forestry label) and SASSI (a sustainable fisheries label). The official definition of each of these eco-labels was acquired from the website of each eco-label. The selected eco-labels were then substituted into the questionnaire used in a study conducted with Swedish consumers to ensure that the results from both studies would be comparable. Thus, the eco-label questionnaire was strongly based on the questionnaire created by Lefébure and Muñoz (2011) for their study on consumer understanding and willingness of consumers to buy eco-labels in Sweden (Table 4).

Table 4: Questionnaire design in relation to theory (as per Lefébure and Muñoz 2011)

Section	Question	Measure	Related to...
Section 1: Understanding and awareness	1 to 5	1) Awareness of the different labels within the South African market 2) Understanding of the message	Thørgesen eco-label adoption process model and the different factors related to whether a consumer will adopt an eco-label.
Section 2: Attitudes and beliefs	1 & 2 3 & 4 5 6 7 8	Pro-environmental attitude Belief in environmentally friendly behaviour Perceive difficulty in understanding eco-labels Overload of too many eco-labels in the market making it difficult to understand Availability of eco-labels Price sensitivity for eco-labels	Measuring different attitudes and beliefs of customers that help to understand other factors that may affect understanding, awareness and recent purchase behaviour.

Section 3: Principles of eco-labelling	1 2 & 3 4 & 5 6 & 7 8 & 9 10	Recent purchase behaviour Transparency Appropriateness Credibility Responsiveness Clarity	Measuring whether respondents feel that eco-labels communicate environmental concerns clearly and justly.

The three factors (percentage of respondents who understood, were aware of, and had purchased the label) were multiplied together for each label to determine the percentage of respondents who have fully adopted each of the labels (as per Lefébure and Muñoz 2011).

In addition to the questions derived from the study conducted with Swedish consumers, a section testing consumer knowledge of generic eco-labelling terms was added. The generic expressions "organic", "free-range", "GMO-free" and "natural" were included in the questionnaire to determine whether consumers have the correct understanding of these terms. The participants were asked to provide their own description of what they believe these terms mean in the context of eco-labelling. The definitions provided were then classified into the appropriate category of the respondent having a clear understanding, partial understanding, or that they did not understand, or did not know (see complete questionnaire in Appendix 1).

Data were collected for 10 weeks as respondents completed questionnaires during the period between 24 June and 31 August 2014. Permission could not be obtained to interview people inside Woolworths and Pick n Pay stores. Thus, consumers were asked if they would like to participate at public venues such as shopping malls, horse riding schools, the University of the Witwatersrand, etc. A total of 88 consumers completed the questionnaire, of which 61 were females and 27 were males. Fourty-eight of the participants were in the 18 to 35 age group, while the other 40 participants were above the age of 35. These consumers were widely distributed across Johannesburg's northern suburbs. The data obtained from these questionnaires were compared to the original study conducted with Swedish consumers where 152 questionnaires were completed (Lefébure and Muñoz 2011).

Statistical analysis

Basic statistical analysis was carried out on the data (as per Lefébure and Muñoz 2011). Chi squared tests and independent sample t-tests with groups were carried out to compare the demographic information of participants, eco-label message quality, and outside factors that can influence eco-label adoption to their awareness, understanding and recent purchase behaviour. Any significant relationships found would indicate what factors affect a consumer's understanding, awareness and recent purchase behaviour. All of the statistical analyses were carried out at a significance level of 0,05 using Statistica and R (StatSoft, Inc. 2007; R Core Team 2014).

Chi-squared tests were used to determine whether there is an association between the demographic information of participants and their understanding and awareness of the eco-label as well as the participants' purchase behaviour with regards to the label.

A chi-squared test was performed to determine if there is a relationship between eco-label message quality in section 3 of the questionnaire and the understanding, awareness and recent purchase behaviour of participants. All chi-squared tests were performed in R (R Core Team 2014).

A comparison was made between the external factors that can influence eco-label adoption set in section 2 of the questionnaire and the understanding, awareness and recent purchase behaviour of participants. This was completed using independent sample t-tests with groups, as this allows each test variable to be grouped by whether they agreed or disagreed with the statement that was put forward. The independent sample t-tests with groups were performed using statistica (StatSoft, Inc. 2007).

4.3 Results

The majority of participants (53%) shopped at Pick n Pay most often, with Woolworths following closely behind (36%). Only 11% of participants shopped at Checkers. This sample demographic is suitable as Woolworths and Pick n Pay stock the most eco-labelled food products.

SASSI was the label with the highest level of awareness (80%) and understanding (58%) among participants. Therefore, a large sample of respondents answered section 3 of the

questionnaire for the SASSI label. However, many respondents did not complete section 3 of the questionnaire for Afrisco, FSC and Fairtrade, as they did not know enough about the message quality of these eco-labels to answer this section. Thus, statistical testing was only performed on responses related to SASSI and not on the other three eco-labels in the questionnaire, as there was an insufficient sample size for the other three labels.

Respondents below the age of 35 were significantly more likely to understand what the SASSI eco-label meant ($\chi^2_1 = 3.905$, p= 0.04814). Many people were aware of a label, yet they did not understand or know what the label meant. On average 40% of the participants understood what the eco-labels meant (Figure 2). There was no significant difference between the awareness and recent purchase behaviour of different age groups.

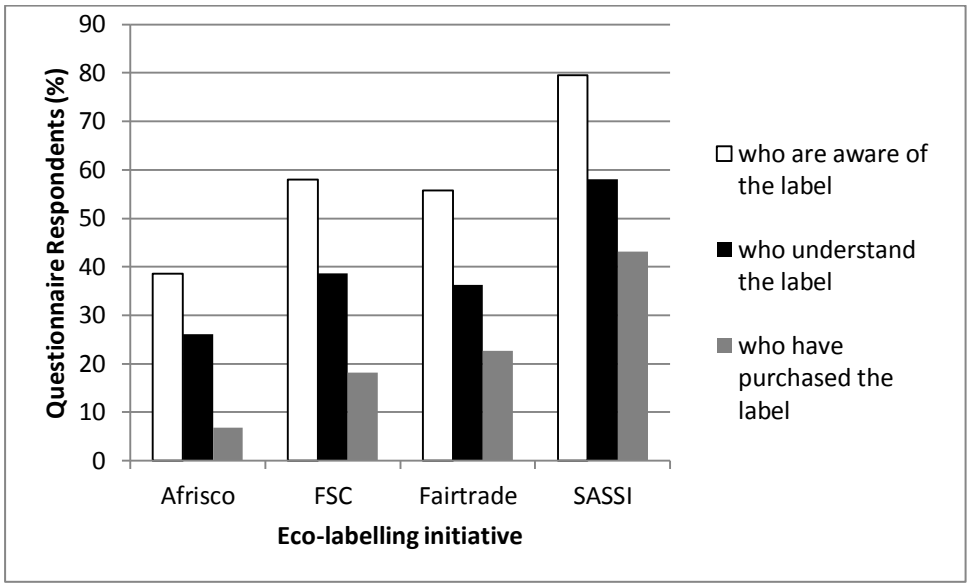


Figure 2: The percentage of respondents who understand, are aware of and have recently purchased the various eco-labels

The number of respondents who understood the various eco-labels ranged between 26 and 58%. Awareness of the eco-labels was generally higher than understanding with a range of 38 to 79%. The percentage of respondents who have purchased the eco-labels was low with a range of 6 to 43% (Figure 2). The percentage of respondents who fully adopted the label was extremely low, as three of the labels were fully adopted by less than 5% of respondents and SASSI, a local label, was fully adopted by one in five of the respondents (Figure 3).

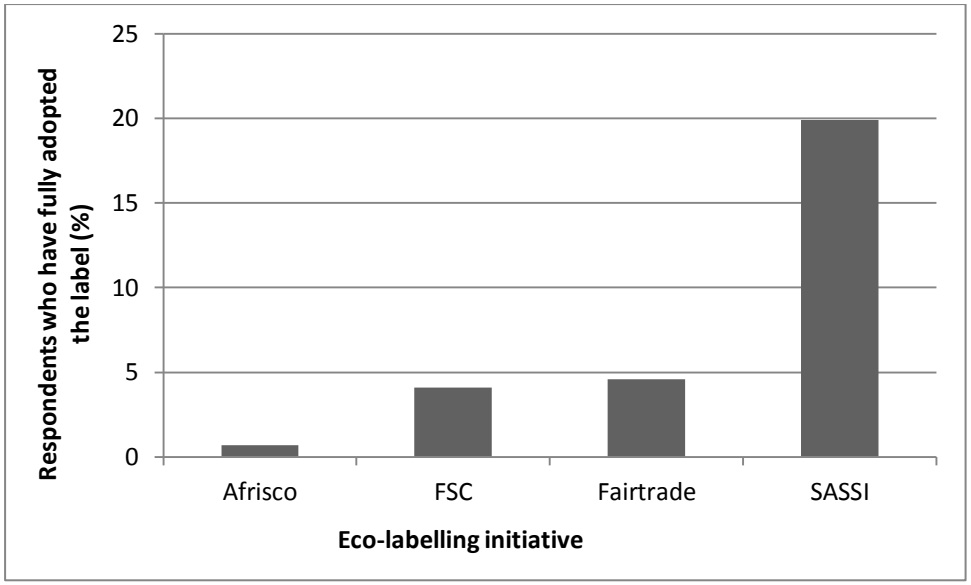


Figure 3: The percentage of respondents who have fully adopted the different eco-labels

The greater part of the participants in this study had a pro-environmental attitude (Table 3). In contrast, only 54% of Swedish respondents had a pro-environmental attitude. If South African consumers had a pro-environmental attitude, they understood, were aware of and had recently purchased a SASSI labelled product ($t_{(72)} = 2.004$, $p = 0.048$; $t_{(72)} = 3.505$, $p = 0.001$; $t_{(77)} = 2.203$, $p = 0.0306$). If consumers were aware of and understood the SASSI label, they were also more likely to feel that there is an excessive number of eco-labels available ($t_{(54)} = 2.209$, $p = 0.0314$; $t_{(54)} = 2.022$, $p = 0.0481$).

Almost all of the participants believed that people should take an interest in the environmental impacts of the products they purchase and in the eco-labels that may be present on products. Forty three percent of consumers felt that choosing eco-labelled products is complicated because there are too many to understand them all, even though eco-labels are not available in the stores where they shop. Many of the consumers did not know the cost of eco-labelled products, but many of them were of the opinion that these products would be priced too high for their budgets (Table 5).

Table 5: The general beliefs and attitudes of participants regarding the environment and eco-labels

	Agree (%)	Disagree (%)
My involvement in environmental activities today will help save the environment for future generations.	**78**	6
There is nothing the average citizen can do to stop environmental pollution.	7	**83**
Consumers should be interested in the environmental consequences of the products they purchase.	**89**	6
People should be concerned about the uses and practices of eco-labelling.	**78**	2
Choosing eco-labelled products is rather complicated.	**52**	15
There are too many eco-labels making it difficult to understand them all.	**43**	20
Eco-labelled products are readily available in the stores I shop at.	25	**43**
Eco-labelled products are priced too high for my budget.	**36**	16

*the opinion of the majority is in bold

For the most part consumers did not know what the level of message quality provided by the various eco-labels was (Figure 4). Half of the respondents stated that they would be willing to purchase eco-labelled products if they knew more about the eco-labels.

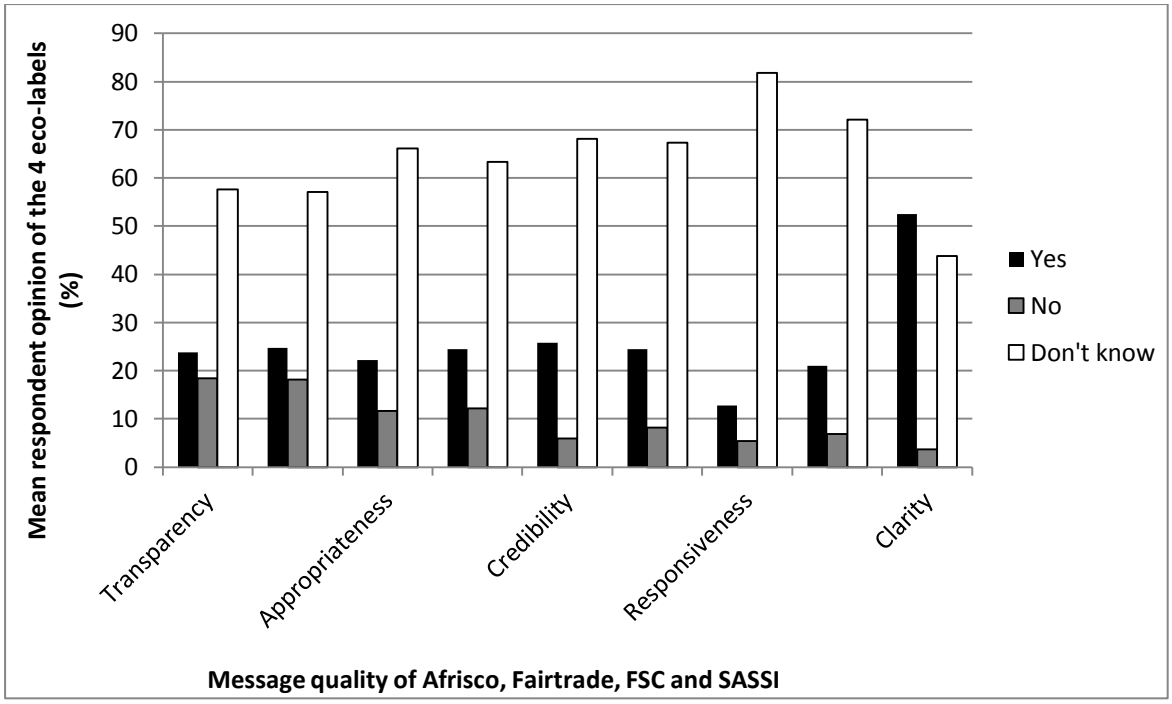


Figure 4: The average consumer opinion on message quality of the four eco-labels

A large number of participants had a partial understanding of the terms “free-range” and “organic”. Consumers had a clear understanding of “organic” most often out of the 4 terms. More than a quarter of participants did not know what GMO-free meant. Most notably, 73% of participants thought that they understood the term “natural”, while the data revealed that they actually did not understand what “natural” means in the context of eco-labels (Figure 5).

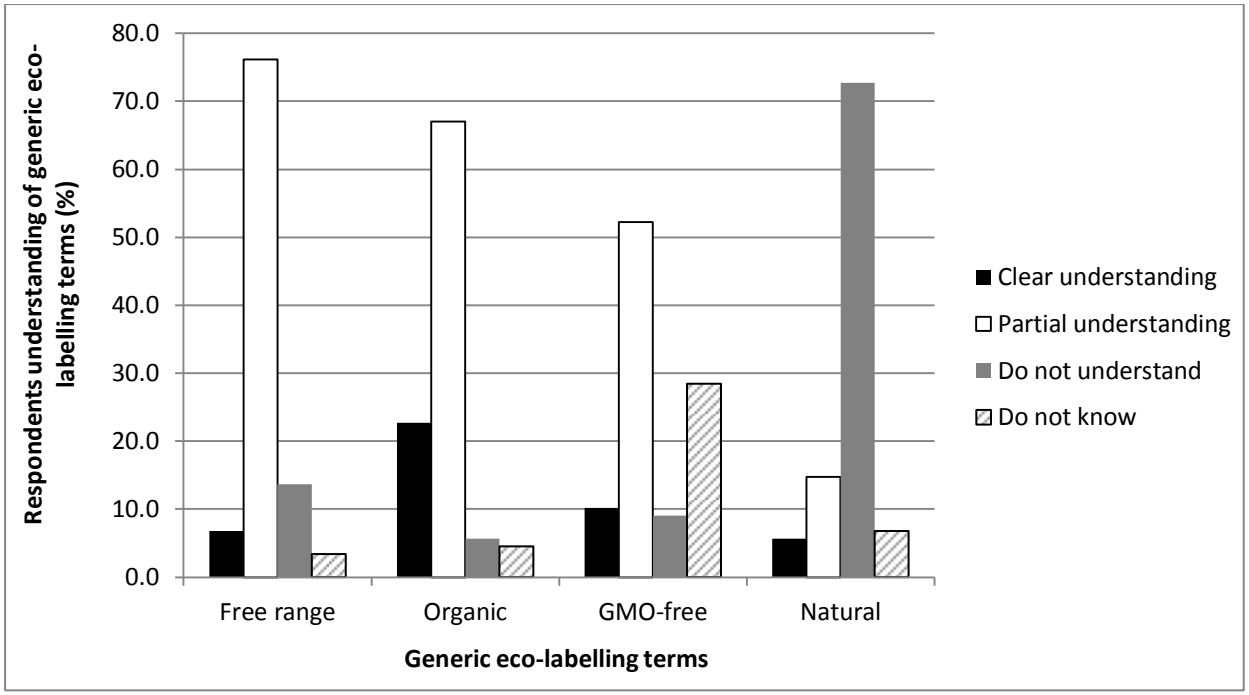


Figure 5: The level of understanding consumers had of generic "eco-label" terms

Comparing the responses of South African consumers to Swedish consumers

In comparison to the study conducted on Swedish consumers, South African respondents on average had an awareness and understanding of eco-labels that was only 11% and 4% lower than the Swedish respondents respectively (Lefébure and Muñoz 2011).

A higher percentage of consumers have fully adopted eco-labels in Sweden (Lefébure and Muñoz 2011). The local Swedish eco-labels have been fully adopted by approximately 20% of respondents, whilst the international labels were adopted by one and two percent of the respondents (Lefébure and Muñoz 2011). This trend is similar to the South African findings (Figure 6).

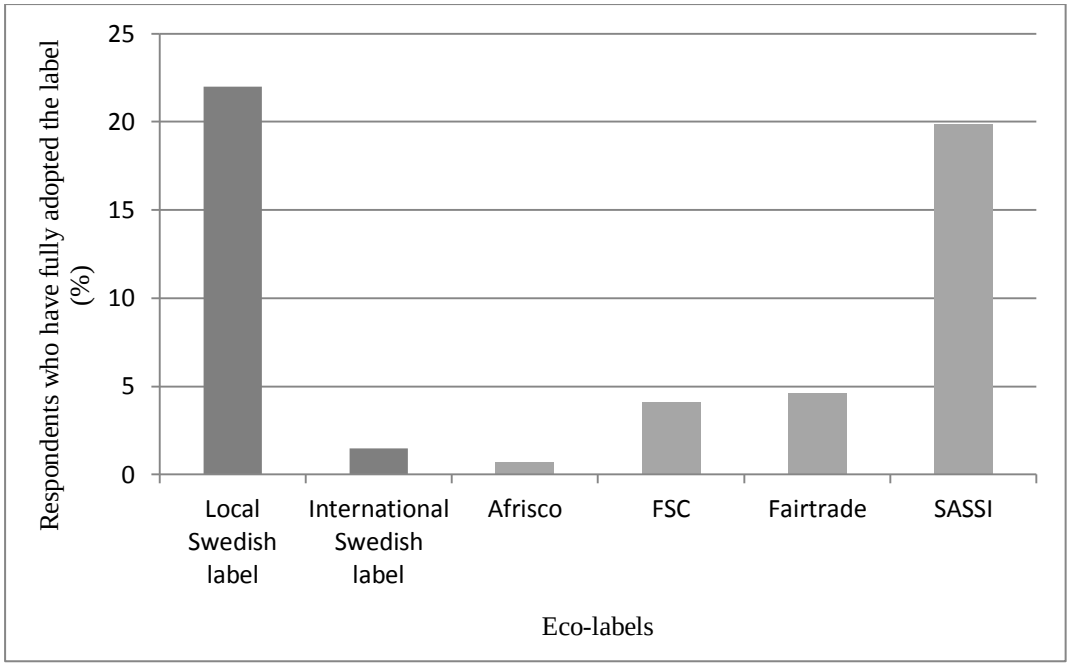


Figure 6: The percentage of Swedish respondents who have fully adopted local and international eco-labels, in comparison to the percentage of eco-labels that were fully adopted in this study

Much like the South African consumers, Swedish consumers also felt that there is an eco-label overload (Lefébure and Muñoz 2011). The perception that there are too many eco-labels indicated that consumers feel overwhelmed and confused when choosing an eco-labelled product.

4.4 Discussion

4.4.1 Connecting awareness, understanding, purchasing behaviour and consumer attitudes

More than half of the participants in this study were aware of eco-labels on food products, but many of them did not understand what the eco-label means. Thus, even if a consumer is aware of an eco-label, they may not understand it. This finding is likely to reduce the willingness of consumers to buy the eco-labelled products (Delmas *et al.* 2012). The average awareness and understanding of eco-labels in South Africa was only slightly lower than that of Swedish respondents. This is a better result than was expected for a comparison between a first-world and developing country. The majority of South African respondents had a pro-environmental attitude, but only half of the Swedish respondents did. This suggests that a portion of South Africans feel the need to and believe that they can make a difference as

individuals to environmental issues. Although the environmental attitudes of Swedes may differ from those of South Africans, the Swedish study revealed a higher percentage of consumers who have fully adopted eco-labels (Lefébure and Muñoz 2011). Since South African consumers have a relatively high pro-environmental attitude it appears that low awareness and understanding of eco-labels, in addition to other factors are playing a role in consumers not purchasing eco-labels.

The percentage of people who fully adopted eco-labels in South Africa was similar to the data obtained in Sweden, but the South African market does seem to lag behind with the rate of adoption of eco-labels. To recap, three factors (percentage of respondents who understood, were aware of, and had purchased the label) were multiplied together for each label to determine the percentage of respondents who have fully adopted each of the labels (as per Lefébure and Muñoz 2011). The local label SASSI was adopted by 20% of respondents, but Afrisco is also a local label and, disappointingly, was only fully adopted by less than 1% of respondents. Furthermore, the international labels FSC and Fairtrade were also poorly adopted. This phenomenon may be explained by eco-labels being relatively new in South Africa. Thus, eco-labels can be considered as an innovative product. Furthermore, it is probable that eco-labels will be fully adopted by more consumers over time if eco-labels are marketed correctly (Thøgersen *et al.* 2010).

Research on the adoption of innovations can be used to explain the stages an individual experiences when exposed to an eco-label (Thøgersen *et al.* 2010). Early adopters are individuals who belong to a small minority, as they are willing to adopt a new product without knowing that others have done so before. These individuals do not need social proof regarding the product, either because of their personality or because they have expert knowledge on the topic (Rogers 2003). The rest of the population, who tend to imitate others due to positive word of mouth, will then begin to adopt the product (Kotler and Roberto 1989). The process of eco-label adoption starts with awareness of the label and then understanding of the label, at this point the consumer will purchase the label if it fits in with their needs and goals. For example, if a consumer has strong concerns about the environment, then they are likely to purchase the label, but if they do not have strong environmental concerns, then they are unlikely to purchase the eco-labelled product. Moreover, paying attention to and understanding an eco-label is dependent on an individual's motivation and issue-relevant knowledge. Once a consumer has adopted an eco-label, they perceive less risk when exposed to a new eco-label and will move through the stages of awareness to adoption

more quickly. However, respondents in South Africa and Sweden felt that there was an eco-label overload and this made selecting an eco-label confusing. Thus, further research is needed to determine whether the learning effect is more or less important than the confusion caused by an abundance of eco-labels (Thøgersen *et al.* 2010).

Consumers felt that there are too many choices of eco-labels available, but they also thought that eco-labels are not readily available where they shop. This may be explained by some products having a wide variety of eco-labels available (e.g. coffee), while other products have only a few eco-labels (e.g. fresh produce). Thus, when consumers do find eco-labelled products, they are overwhelmed by the choice available, but they repeatedly do not see any eco-labels on other types of products (Auld 2010; Delmas *et al.* 2012).

Consumers did not know the price of eco-labels, but they assumed that they were priced too high for their budgets. Eco-labels are usually sold at a price premium, but this premium is regularly not significantly more than the price of the equivalent regular product (Delmas *et al.* 2012). Pricing concerns should be addressed in the awareness campaigns for eco-labels.

A lack of awareness and understanding means that consumers do not know what the quality is of the message being delivered by eco-labels. This is problematic, as it can result in consumers having a low level of trust in these eco-labels (Nilsson *et al.* 2004). However, the respondents who were aware of and understood an eco-label felt that the label was transparent and appropriate. Furthermore, many respondents expressed the opinion that, if they knew more about a label in future, then they would be more likely to purchase it. This is encouraging as consumers who understand eco-labels seem to inherently trust the label which would make them more motivated to purchase it (Delmas *et al.* 2012). Additionally, consumers who were unaware of the labels were open to the idea of learning more about them and purchasing them.

Research suggests that buying eco-labels is a high effort process, as adopters are highly involved in the decision making process and alternative products are highly differentiated (Kotler and Roberto 1989; Hoyer and MacInnis 2006; Thøgersen *et al.* 2010). Many consumers were not aware of the eco-labels, but it is likely that some of these consumers may have purchased products with an eco-label on the packaging without noticing it, because the label is too small. Eco-labels are generally very small on a product's packaging and not much information related to the eco-label is provided. Consumers need to research the meaning of eco-labels on the internet to understand them, but this requires more effort than most

consumers are willing to invest in their grocery shopping (Diem My 2012). Eco-labelling initiatives should take note of this and try to make access to further information on the eco-label more convenient. For example, the small pocket guides that are printed and distributed by SASSI in various locations, such as aquariums are a great idea.

Greater coverage in the media on eco-labels is recommended to improve the public's understanding of these labels. For example, interviews with newspapers, magazines and radio stations will be a low-cost exercise for improving the public understanding and awareness of eco-labels (Nilsson *et al.* 2004; Diem My 2012). This is a more feasible option than suggesting that these labelling initiatives spend money on advertising, as they may have limited budgets.

It is clear that further research into the needs and perceptions of South African consumers regarding eco-labels is needed. This research should aim to answer the following types of questions: Why is SASSI still only understood by one in five people when it is widely advertised within the stores where accredited products are sold? Are the consumers who are purchasing eco-labelled products perhaps doing so because of a perceived health benefit, and not because of the environmental benefits? This research would bring more clarity to how eco-labelling initiatives in South Africa can improve by revealing the motivations / lack of motivation for South Africans to buy eco-labelled products.

4.4.2 Consumer understanding of generic eco-label terms

"Free-range" and "organic" are terms that are heard often in the media, so consumers commonly had a partial understanding of these terms (Aarset *et al.* 2004; Mutlu 2007; Engel 2008). This indicates that if terms are widely visible, then consumers are likely to be aware of and have at least a partial understanding of the term. Thus, awareness campaigns of eco-labels are likely to increase the awareness and understanding and, feasibly, the adoption of eco-labels.

More than a quarter of respondents did not know what GMO-free meant. GMO labelling is controversial and consumers' personal beliefs regarding genetic engineering will affect how they think GMO products should be labelled (van der Merwe and Venter 2010). However, if a large proportion of consumers do not know what "GMO-free" means, then they will not

know about the environmental effects of GMOs either. Thus, they will not be able to make informed shopping choices regardless of labelling.

Almost all consumers thought that they understood the term “natural” when in reality they did not, at least in the context of what this “eco-label” really means. This will result in producers selling more products under the false pretence that their product is organic, as most consumers felt that natural could be defined as organic or that it is superior to organic (Aarset *et al.* 2004).

The relatively slow rate in the adoption of eco-labels by consumers in South Africa may be attributed to the psychology behind changes in an individual’s behaviour. Europeans were more likely to change their purchasing behaviour, as eco-labels provided a health benefit to them. Conversely, South Africans may be less motivated to change their purchasing behaviour, as eco-labels do not provide an immediate or direct benefit to the consumer (Rothschild 1999; Steg and Vlek 2009).

Although the percentage of South African people who have fully adopted eco-labels is relatively low, supermarkets should continue to stock and expand eco-labelled product ranges. Supermarkets who stock reputable eco-labels will improve the environmental and social responsibility image of their stores in comparison to competitors (Golden 2010). Supermarkets also need to consider the long term sustainability of product supply chains because difficulty in being able to source adequate food stock is a risk to their business model (Dimitri and Oberholtzer 2009). Eco-labelled food products are more likely to be available at a constant supply level in the future as this food is produced in a more sustainable manner (Seuring and Müller 2008).

South Africa earned R62 750 million in 2012/13 from exporting agricultural products. This is a 16.4% increase from the 2011/12 period, and represents the steady growth in agricultural exports since markets began recovering from the 2008 financial crisis. The two countries that South Africa exports the most agricultural products to are the Netherlands and the UK (Department of Agriculture, Forestry and Fisheries 2013). Both of these countries have many consumers and supermarkets who are interested in supporting eco-labelled food products. Thus, it is advantageous for South African farmers to be certified as environmentally responsible by a reputable eco-labelling initiative if they wish to export their products. The farmers who do have an eco-label certification are likely to perform better within the competitive exports market (Engel 2004).

Global change issues, such as increases in population numbers, climate change, and urbanisation will increase the difficulty to produce and supply food (Misra 2014). Thus, the inherent value of food that is produced in a sustainable manner, by conserving soil and water quality, will increase. Furthermore, the demand for sustainable food products and eco-labels will increase. Consequently, South African food producers should move towards producing food in a manner that will grant an eco-label certification of their products. This will allow for more growth of South Africa's food exports market; with the increasing demand for sustainably produced food (Jooste and Spies 2006; Seuring and Müller 2008).

CHAPTER 5: DISCUSSION AND CONCLUSION

5.1 Summary

The ultimate goal of eco-food labelling initiatives is to reduce the negative environmental and social impacts of current food production systems (Zaman *et al.* 2010). To achieve this goal eco-labelled food must be readily available and fully adopted by a considerable number of consumers.

The range of eco-labels available globally is very diverse, and from this diversity generic terms that are often used on eco-labels have emerged. The generic term often appears alone with no further information about the eco-label on the product. Therefore, consumers do not know who has certified the eco-label or the details of the environmental problems that led to the eco-label being created. This does little to instil trust or motivation for the consumer to purchase the label. Reviewing the generic terms used on eco-labels in South Africa revealed that legislation is lacking for some of these terms but that the eco-labelling bodies do have adequate standards for a few of the terms (see chapter 2).

Eco-labels must be environmentally reliable, transparent and communicate well with consumers if they are to effectively promote environmental justice (Zaman *et al.* 2010). The most commonly found eco-labels in South Africa are certified by an independent third party and one of them is an in-house certified eco-label. There is a lack of transparency from supermarkets concerning the eco-labelled products that are stocked. The in-house eco-label lacked transparency but did have good communication with consumers, making it problematic to judge the efficacy of the label in reducing negative environmental impacts. The third party certified eco-labels are accredited to major international regulation bodies such as IFOAM and ISEAL (Will and Guenther 2007). Consequently, the independent third party labels were environmentally reliable and transparent but many of these labels fell short in communicating well with consumers. A variety of eco-labelled food is being sold by major South African supermarkets but these products are only a small portion of the food on offer and are not consistently available.

The consumer understanding and awareness of the participants in this study of eco-labels in South Africa was lagging behind Sweden, but only slightly (Lefébure and Muñoz 2011). The percentage of people who have fully adopted eco-labels is far too low for it to have an impact

on the way in which the South African food industry operates. Eco-labelling initiatives need to promote their products more and improve the awareness of the environmental issues which the eco-labels address. However, respondents in this study assumed that eco-labels were priced too high for their budget. The price of a food product is likely to be a serious consideration to consumers in a developing country which may be one of the explanations for why eco-label sales are low (see chapter 4).

5.2 The potential future of eco-labels in South Africa

The origin of eco-labels may lie in Europe where eco-labels were created with a focus on health but eco-labels are rapidly evolving and taking on more of an environmental and social focus. Developing countries such as South Africa should make full use of the opportunities that eco-labels provide. Supermarkets are being pressured to become greener by consumers and the governments' drive for a green economy, and eco-labels are a simple solution for supermarkets to stock more sustainable produce (Golden 2010). Furthermore, supermarkets may find that eco-labelled products are available in a more consistent manner than regular food products in future, it is essential that large supermarket chains are able to supply the goods that their customers demand (Seuring and Müller 2008). Eco-labels are a great prospect for South African farmers to increase their exporting potential. South Africa has a significant agricultural exports sector which can be boosted if more farmers receive eco-label certification (Department of Agriculture, Forestry and Fisheries 2013). The eco-labelled products would be more competitive and sought after in the international market (Engel 2004).

Currently eco-labels are not being fully adopted by a sufficient number of people to generate changes to environmental practices within the food production industry. This phenomenon may be because eco-labels are relatively new in South Africa and are still considered innovative products (Thøgersen *et al.* 2010). However, there are a number of environmentally reliable eco-labels in South Africa for consumers to choose from if they wish to purchase an eco-labelled product. Yet, the number of consumers who are fully adopting eco-labels is very low. Looking back to the conceptual relationship among industrial ecology, green marketing and environmental justice created by Oyewole (2001) (see chapter 1), it seems that the gap to achieving environmental justice is that green marketing to the consuming public is ineffective. Eco-labelling initiatives do not make it easier for consumers to learn more about

why the eco-label is a sustainable choice. Furthermore, customers generally do not have the time or competency to directly assess the environmental impacts of a product (Houe and Grabot 2009). Consequently, even though consumers may be aware of an eco-label, they often do not understand what it means or are not motivated to purchase it (Delmas *et al.* 2012). For example, SASSI the eco-label with the highest awareness (80% aware), was not necessarily understood by respondents (58% understand), and only 20% of respondents had fully adopted the label. This highlights the need for better stakeholder engagement from eco-labelling initiatives. Eco-labels were ineffective at communicating with consumers as South African consumers are a large and diverse target group. Thus, it is advisable that eco-labelling initiatives reassess how they approach stakeholder engagement. Perhaps, eco-labelling initiatives can be more effective at engaging with supermarkets and supermarket suppliers, as focused discussions can be started and long term relationships can be built with these groups.

5.3 Conclusion

5.3.1 An alternative to eco-labels

When considering all of the above evidence, it is clear that eco-labels are not as popular as one would hope in South Africa and in the first-world country Sweden. Eco-labels have been present in Sweden for decades and the populace are able to afford the price premium on eco-labels, yet the number of people who have fully adopted eco-labels remains low (Lefébure and Muñoz 2011). Perhaps the people who are purchasing eco-labels are usually only doing so because of a perceived health benefit (Golden 2010). Furthermore, eco-labels may take on a form of environmentally responsible behaviour that is not appealing to consumers on a deeper psychological level. Eco-labels are dependent on altruism, where people buy an eco-label to benefit something other than them-selves (Zaman *et al.* 2010). But research has shown that environmentally responsible behaviour that relies on acts of altruism is unappealing, as it creates a sense of personal sacrifice (Kaplan 2000). When faced with eco-labels people may feel that "Why should I make the personal financial sacrifice for this eco-labelled product with a price premium, when everyone else is going to buy the cheaper regular product anyway?". Thus, eco-labels may use the incorrect approach in terms of motivating consumers on a deeper psychological level to help the environment.

If eco-labels are not effective then how can we differentiate products with different levels of environmental performance? The answer may lie in removing the eco-label from the product, and creating widespread change on the supermarket supply chain level. Companies are moving away from greening one or two product lines to making the entire companies operations more sustainable. These companies are not particularly interested in the eco-label being physically present on a product; instead they expect more sustainable practices to occur on the supply chain level. The company usually has a long standing relationship with the supplier and a third party audit to certify that the supplier is performing at a high environmental standard is enough to satisfy the company (UNEP 2005).

If an entire supermarket is perceived to be putting in a large amount of effort to become green, the psychology of consumers may change in relation to the way that they feel towards environmental responsibility. To elaborate on this concept, the drivers that motivate people should be analysed. Becker (1975) explained three interacting motives that motivate even extreme behaviour for people, namely the need to belong to a group, the need to rise above a group, and the need to stamp out evil. Though a bit of a leap these needs can be extended to the motivations that drive environmentally responsible behaviour, in that people would like to belong to a group, yet they would like to feel as if they are exclusive members of the group, and in this case the group would stamp out the evil of environmental degradation. Therefore, if an entire supermarket states that they are doing everything within their power to have sustainable supply chains and operate more sustainably, consumers will want to be a part of this group as the supermarket is more exclusive than regular stores and the supermarket is reducing environmental degradation. Consumers who shop at this store will not feel a sense of personal sacrifice but instead a sense of belonging to a greater cause.

Eco-labels are supposed to be driven by consumer demand and supermarkets are meant to follow these demands but if we are now relying on the supermarkets to make the responsible choice then how will this model work? The South African government's drive for a green economy should place pressure on retailers to become more sustainable (Peter and Swilling 2010; Economic Development Department 2011). Policy should be created to encourage retailers to become more sustainable.

It may be time to tentatively contemplate that eco-labels are perhaps not the most effective tool for promoting environmental justice in their current form. Eco-labels should be adapted from being a choice that a consumer must make standing at a supermarket shelf to being a

choice that the “green” retail procurement team makes when stocking their supply chain. This approach could have a much greater chance to achieve more environmentally and socially sustainable food production practices.

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APPENDIX 1: SAMPLE OF THE QUESTIONNAIRE COMPLETED BY RESPONDENTS

<u>Section 1:</u> Below are examples of four commonly found eco-labels in South Africa. Which one statement best describes each of the following Eco-labels?

1. 

a) Sustainably produced product or service
b) Products that do not contain synthetic fertilisers, pesticides, genetically modified organisms and which have not been irradiated.
c) Sustainably harvested forest
d) Do not know
e) I have not seen this Eco-label before

2. 

a. Responsible management of forests worldwide
b. Chemical-free products
c. Organic farming in European countries
d. Do not know
e. I have not seen this Eco-label before

3. 

a. Products focused on improving labour and living conditions for farming communities
b. Organic food production that is also socially responsible
c. Is a type of charity
d. Do not know
e. I have not seen this Eco-label before

4. 

a. Products that are produced in a socially responsible manner
b. A ‘third-party’ certification program for sustainable fishing practices.
c. Fish grown in fish farms (aquaculture)
d. Do not know
e. I have not seen this Eco-label before

<u>Section 2:</u> Please write what you understand the following terms to mean:

Free-range -

Organic -

GMO free -

Natural –

<u>Section 3:</u> To what extent do you agree or disagree with the following statements? Please circle the number that best corresponds to your answer. (Strongly disagree = 1, Strongly agree = 5)

1.	My involvement in environmental activities today will help save the environment for future generations.	1 2 3 4 5
2.	There is nothing the average citizen can do to stop environmental pollution.	1 2 3 4 5
3.	Consumers should be interested in the environmental consequences of the products they purchase.	1 2 3 4 5
4.	People should be concerned about the uses and practices of eco-labelling.	1 2 3 4 5
5.	Choosing eco-labelled products is rather complicated.	1 2 3 4 5
6.	There are too many eco-labels making it difficult to understand them all.	1 2 3 4 5
7.	Eco-labelled products are readily available in the stores I shop at.	1 2 3 4 5
8.	Eco-labelled products are priced too high for my budget.	1 2 3 4 5

<u>Section 4:</u> Please circle *<u>Yes</u>* if you agree with the statement or circle *<u>No</u>* if you disagree with the statement for each Eco-label you recognize. If you do not recognize the Eco-label or do not know the answer, please do not mark anything for that question.

	AFRISCO certified organic	FSC	FAIRTRADE	SASSI
I have recently purchased a product or service that was certified by this eco-label.	Yes / No	Yes / No	Yes / No	Yes / No
It is easy to access and learn information about this eco-label.	Yes / No	Yes / No	Yes / No	Yes / No
My knowledge about this eco-label does not come from the company but instead from colleagues and friends.	Yes / No	Yes / No	Yes / No	Yes / No
This eco-label is interested in more than just selling me a product and making a profit.	Yes / No	Yes / No	Yes / No	Yes / No
This eco-label offers me relevant information.	Yes / No	Yes / No	Yes / No	Yes / No
If this eco-label makes a claim or promise about a product it is probably true.	Yes / No	Yes / No	Yes / No	Yes / No
I believe the information about this eco-label is accurate.	Yes / No	Yes / No	Yes / No	Yes / No
This eco-label's guidelines and certifications are up to date.	Yes / No	Yes / No	Yes / No	Yes / No
This eco-label is adapted to the current environmental needs.	Yes / No	Yes / No	Yes / No	Yes / No
With a better understanding of this eco-label, I would be willing to purchase more products that have this logo.	Yes / No	Yes / No	Yes / No	Yes / No

General Information

Which age bracket do you fall into? (Please tick the appropriate box)

18 - 25	26 - 35	36 - 45	46 - 55	56 - 65	65+

Are you male or female? Male ☐ Female ☐

Please indicate which supermarket you shop at most often:

☐ Checkers

☐ Pick n Pay

☐ Woolworths