BUSINESS IS KEY: A SUSTAINABLE SUPPLY CHAIN MANAGEMENT CHECKLIST COULD HOLD THE SOLUTION TO ENVIRONMENTAL PRESERVATION

by

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Thesis presented in fulfilment of the requirements for the degree of Master of Philosophy Environmental Management in the Faculty of Economic and Management Science at Stellenbosch University

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March 2017

DECLARATION

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ABSTRACT

Sustainability is key for global survival, but the problem is raised as to how the world can achieve sustainability. Businesses hold the potential to have a massive impact regarding how products are produced, raw materials are purchased and product waste is handled. This raises the question as to how businesses can actually implement sustainability throughout their operations. This study aims to assess the use of companies' supply chains to address this question. This paper will look into both academic theories of supply chain sustainability and practical commitments made by companies, and assess where the overlays exist.

Secondary research was conducted by means of a literature review, looking into many theoretical concepts including but not limited to: sustainable supply chain management, the triple bottom line, reverse logistics, sustainable sourcing and sustainable development. Furthermore, case studies were developed for the fast-moving consumer goods industry by looking into six companies (four international and two South African). These case studies were developed by using sustainability reports, newspaper articles and articles published by NGOs.

It was determined by the findings of this paper that there are three key areas of sustainable sourcing, which are: (1) *Supplier relationships*, looking into using a firm's influence over suppliers, improving small-scale farming practice, forming partnerships with suppliers, as well as developing a supplier code of conduct; (2) *Holistic Purchasing Strategy,* whereby firms no longer look merely at price but take the externalities which impact sustainability into account when purchasing for their supply chain; (3) *Partnerships with NGOs,* whereby companies form relationships with NGOs in the areas in which they wish to improve and benefit from shared expertise.

The findings for reverse logistics revealed two key areas, these are: (1) *Product design,* whereby businesses focus their product design on different principles to increase sustainability, like design for environment, design for sustainability, design for disassembly, design for recycling, and design for remanufacture; (2) *Product Recovery,* whereby companies look both in-house to recycle and reduce waste that

goes to landfills and end-user/consumer recycling of waste their products create. These findings from sustainable sourcing and reverse logistics form the foundation for the development of the checklist which businesses can use to assess their sustainability efforts and then make the appropriate changes.

Future research that can be addressed includes studies that replicate this study but make use of different industries like technology or high-end beauty products. Another area could be a replica study of the companies discussed in this study to assess at a future point their progress and current commitments. Alternative research could focus on the other aspects of supply chain management which were not covered in this paper, namely warehousing, production and distribution.

Keywords: sustainable reverse logistics, sustainable sourcing, sustainable procurement, supply chain, sustainable development, sustainability, sustainable supply chain management, FMCG.

OPSOMMING

Volhoubaarheid is die sleutel tot globale oorlewing, maar die vraag is hoe die wêreld by volhoubaarheid kan uitkom. Sake-ondernemings het die potensiaal om ’n groot invloed te hê op hoe produkte vervaardig word, rou material aangekoop word en hoe afvalmateriaal hanteer word. Die vraag ontstaan hoe besighede volhoubaarheid tasbaar kan implementeer regdeur hul ondernemings. Hierdie studie wil die gebruik van maatskappye se voorsieningsketting bepaal om dié vraag te beantwoord. In dié verhandeling sal gekyk word na akademiese teorieë van voorsieningsketting-volhoubaarheid én die praktiese toepassings waartoe maatskappye hulle verbind het, en waar die twee oorvleuel.

Sekondêre navorsing is gedoen deur middel van ’n kritiese oorsig van publikasies, met die klem op teoretiese konsepte (maar nie beperk daartoe nie) van: volhoubare voorsienings kettingsbestuur, drievoudige verslagdoening, terugwaartse logistiek, volhoubare verkryging en volhoubare ontwikkeling. Voorts is gevallestudies ontwikkel vir die hoëomset-verbruiksgoedere-industrie deur ondersoek in te stel na ses maatskappye (vier internasionaal en twee plaaslik). Hierdie gevallestudies is saamgestel met behulp van volhoubaarheidsverslae, koerantartikels en artikels wat deur Nie-regeringsorganisasies (NRO’s) gepubliseer is.

Die bevindinge van hierdie verhandeling is dat daar drie sleutel-areas is vir volhoubare bronverskaffing, naamlik: (1) *Betrekkinge met bronverskaffers* – die studie van ’n firma se invloed op verskaffers; die verbetering van kleinskaalse boerdery-praktyke; die opbou van vennootskappe met verskaffers, sowel as die ontwikkeling van ’n verskaffers-gedragskode. (2) *Holistiese Aankoopstrategie*, waar firmas nie langer slegs na prys kyk nie, maar buitefaktore in ag neem wat volhoubaarheid beïnvloed wanneer hulle aankope doen by hul verskaffers. (3) *Vennootskappe met Nie-regeringsorganisasies*: Besighede kan vennootskappe met NRO’s aangaan in areas waarin praktyke kan verbeter en kundighede en vaardighede gedeel kan word.

Die bevindinge oor terugwaartse logistiek het twee sleutelareas uitgewys:

1. *Produkontwerp:* Dit is wanneer maatskappye hul produkontwerp fokus op ander beginsels om volhoubaarheid te verbeter, soos Ontwerp vir Omgewing, Ontwerp vir Volhoubaarheid, Ontwerp vir Demontasie, Ontwerp vir Herwinning en Ontwerp vir Hervervaardiging.
2. *Produk-verhaling*: Maatskappye poog om gedurende die vervaardigingsproses afvalstowwe te verminder of om te sien hoe dit herbruik kan word, sodat minder afval by stortingsterreine beland. Sodoende word minder rommel ook deur die verbruiker van hierdie produkte geskep.

Hierdie bevindinge van die gebruik van volhoubare bronmateriaal en terugwaartse logistiek, vorm die basis waardeur ’n vervaardiger ’n kontrolelys met bepaalde volhoubaarheids-doelwitte kan opstel. Hiermee kan hulle gereeld meet of die doelwitte bereik word en aanpassings maak om te verbeter.

Toekomstige navorsing kan gedoen word met soortgelyke studiemetodes, maar in verskillende industrieë, soos byvoorbeeld die vervaardiging van tegnologiese produkte en/of eksklusiewe skoonheidsmiddels. Verder kan hierdie studie herhaal word, maar oor ’n paar jaar om te bepaal of die maatskappye wel hul doelwitte ten opsigte van volhoubaarheid bereik het. Alternatiewe navorsing kan fokus op ander aspekte van die voorsieningsketting wat nie in hierdie studie gedek is nie, naamlik opgaring, produksie en verspreiding.

Sleutelwoorde: Volhoubare terugwaartse logistiek, volhoubare verkryging, volhoubare verskaffing, volhoubare ontwikkeling, voorsieningsketting, volhoubaarheid, volhoubare voorsieningskettingsbestuur, hoëomset-verbruiksartikels.

"Education, if it means anything, should not take people away from the land, but instil in them even more respect for it, because educated people are in a position to understand what is being lost. The future of the planet concerns all of us, and all of us should do what we can to protect it. As I told the foresters, and the women, you don't need a diploma to plant a tree."

— Wangari Maathai, Unbowed

ACKNOWLEDGEMENTS

First, I would like to thank my Granny and Grandpa for setting up an educational trust so that I could be afforded the opportunity to study. Ouma, you really were my guardian angel and I'm so sorry I didn't graduate in time for you to be a part of this final step which you made possible. To Linda, Clive, Carey and her lovely kids Andrea and Gabby for keeping me fed and housed during the initial stages of my journey into sustainability. To my mom and dad for allowing me to be dependent on you both. Kalvin, thanks for being my techno geek and fixing all my PC-related needs. To Mrs Scott and Eveline for helping me see nothing can stand in my way. To my friends for always lending an ear to hear about the struggles I faced in completing this paper. And lastly to the wonderful and inspiring Wangari Maathi for being the reason my focus in life has come about and for showing me how one woman can make an impact of this planet; I will be a Hummingbird.

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LIST OF ABBREVIATIONS

BCI	Better Cotton Initiative
CEO	Chief Executive Officer
CSR	Corporate Social Responsibility
DFD	Design for Disassembly
DFE	Design for Environment
DFLC	Design for Life Cycle
DFR	Design for Recycling
DFRem	Design for Remanufacture
DFSV	Design for Serviceability
EU	European Union
FMCG	Fast Moving Consumer Goods
FSC	Forest Stewardship Council
G.A.P	Good Agricultural Practice
GHG	Greenhouse Gases
HDPE	High-Density Polyethylene
ISO	International Organisation of Standards
LCAs	Lifecycle Assessments
MSC	Marine Stewardship Council
NGOS	Non-governmental Organisations
P&G	Procter and Gamble
PE	Polyethylene
PET	Polyethylene Terephthalate
PKO	Palm Kernel Oil
PP	Polypropylene
RL	Reverse Logistics
RSPO	Roundtable on Sustainable Palm Oil
SASSI	South African Sustainable Seafood Initiative
SC	Supply Chain
SCM	Supply Chain Management
SD	Sustainable Development
SMART	Specific, Measurable, Attainable, Relevant and Timely
SRS	Socially Responsible Sourcing

SSCM	Sustainable Supply Chain Management
TBL	Triple Bottom Line
UN	United Nations
WWF	World Wildlife Fund
ZMWTL	Zero Manufacturing Waste to Landfill
ZWTL	Zero Waste to Landfill

CHAPTER ONE
INTRODUCTION AND BACKGROUND

1.1 Introduction

We live in a world in which climate change, deforestation, water pollution, air pollution and the energy crisis are all common topics in the news media and at the dinner table. Why, in a world in which these problems are so widely commented on, is business still operating as if there are infinite resources and that population growth is a good thing? Why is more not being done by businesses to address and curb these global issues? Yes, there are some examples of companies that are trying to reduce their impact on the planet, but what are the majority waiting for? Compulsory legislation, consumer demands, or maybe until they have no other option? This is not good enough. Business has the potential to make changes to curb the environmental issues the world currently faces.

This paper aims to illustrate ways in which companies can use their supply chains to address these environmental issues. This chapter will lay out the groundwork for the following chapters with a brief look at the literature around supply chains, business responsibilities, environmental issues, as well as set out the methodology for this paper.

1.2 Background

There are many issues that have led to the need for businesses to change the way they conduct their operations. These reasons will be discussed in detail in the sections to follow.

1.2.1 Environmental issues

It has been found that there are 11 major issues facing the planet today. These are climate change; energy; water; biodiversity and land use; resource depletion; chemicals, toxins and heavy metals; air pollution; waste management; ozone layer depletion; oceans and fisheries; and deforestation (Esty & Winston, 2006: Cohen, 2007).

These issues are not limited to one geographical region; they are global and impact on all, both rich and poor, corporations and individuals, animals and humanity. Global ecological degradation, the growing poverty gap, increasing inequality of income and the materialistic trend of consumerism show that finding global solutions remains a present-day issue. An assessment done by the Millennium Ecosystem Assessment (2005:1), stated that "over the past 50 years humans have changed the ecosystem more rapidly and extensively than in any comparable period of time in human history [and this] has resulted in a substantial and largely irreversible loss in diversity of life on Earth".

It is generally accepted that businesses should play an important stewardship role in addressing sustainable development concerns, due to the triple-bottom-line framework, which has rapidly gained recognition. Solutions need to be generated that will decrease the damaging impacts which corporations are having on the environment (Ellington, Meo, & Sharfman, 1997; Morse & Verhezen, 2009; Matos & Hall, 2007; Wu & Pagell, 2011).

1.2.2 Sustainable development

The past two decades have seen the rise of an increasing awareness of the unsustainability of the current model of global development: from the loss of biodiversity with overfishing, the felling of rainforests and the negative effects of mankind's consumption trends are having on the climate and the environment. Mankind's way of life is placing an accumulative burden on the Earth. There is intensifying evidence to suggest that this cannot be sustained (Fleury & Davies, 2012). This thus shows the need for sustainable development.

The most well-known and widely used definition of sustainable development (SD) is from the World Commission on Environment and Development in 1987 following the Brundtland Commission's report on global environment and development (Berning, 2014). SD was defined as "development that meets the needs of the present without compromising the needs of future generations to meet their own needs" (Brundtland, 1987). This notion of SD supports both the idea of social development and economics, while at the same time emphasising the importance of preserving and protecting natural resources and the environment. This means that social and

economic activities may not carry on if they destroy the natural environment in such a way that will be detrimental to future generations (Berning, 2014). It is important to note that sustainability and SD are often used interchangeably in many articles (Aras & Crowther, 2009).

Sustainability is a multi-faceted, expansive and widely debated concept (Wilkinson, Hill, & Gollan, 2001), which has many different definitions and implications. Larson (2010) stated that sustainability reflects upon the needs of the natural world, while noting the services and value it provides to mankind's ability to build and retain an economy. Tshikila (2011) mentioned that the concept of SD provides an outline for the efficient use of natural resources, the safeguarding and improvement of quality of life, effective development of infrastructures, and economic or business development whilst protecting the environment. SD can also be described "as a process of change to bring a new order of development to achieve sustainability. This umbrella term is not limited to physical values, economic development, material flows and physical environmental improvements, but also includes the social well-being and quality of people's lives" (Tshikila, 2011:25).

The South African Education and Environment Project defines SD as a practice by which the needs of the present generation are fulfilled without affecting the ability of future generations to fulfil their own needs. This is often entitled intergenerational equality; the idea is that the current generation should share natural resources with future generations of the Earth's inhabitants. This means that the current generation can use a certain amount of the Earth's resources, but should never completely deplete a natural resource.

Sustainability is seen to have the ability to reduce long-term risks associated with changes in energy costs, resource depletion, pollution and waste management, as well as product liabilities (Shrivastava, 1995). Shrivastava (1995:955) further states that "by systematically addressing these long-term [sustainability] issues early, companies can become aware of and manage these risks". This is evident as proactive involvements in sustainability practices have the potential to lower the risk when new and costly regulations are introduced to the market (Porter & Van de Linde, 1995).

The urgency of SD issues is well explained by FitzRoy and Papyrakis (2016), who discussed how Western material consumption is already unsustainable, let alone if this demand is imitated by less developed countries. It is reasoned that the resources of three to five planets will be needed to meet the demands of the world, if the global demand is to reach that of the present North American demand level per capita (Verbeke, 2009).

Unfortunately the definition of sustainability is difficult for organisations to apply as it provides little assistance regarding how companies can identify future versus present needs, or promote the understanding of how to effectively balance organisational responsibilities to multiple stakeholders, or help companies determine the technologies and resources required to meet the needs of different generations. Furthermore, because the Brundtland Commission's definition is so extensive, organisations often find it difficult to define their individual roles within this broader, macro-economic perspective (Carter & Rogers, 2008).

1.2.3 Business role in sustainable development

In recent years, environmental and social issues like poverty alleviation have received a lot of international focus in business agendas (Gold, Hahn & Seuring, 2013). There is an ever-increasing stakeholder expectation for companies to be completely responsible for all their operations, and to visibly demonstrate their ethical and environmental behaviour (Ashby, Leat & Hudson-Smith, 2012). Companies like Disney, Nike, Adidas, Levi and Benetton have been at the centre of blame in recent years. These companies have faced blame for issues of inhuman working conditions and environmental contamination in their production process (Seuring & Müller, 2008). The challenge is thus raised for industries on how they will manage their products and processes in a way that allows for more equal distribution of cost and benefits between the social, environmental and economic spheres (Fleury & Davies, 2012).

Corporations can simply implement sustainability as an afterthought, but it is key to build sustainability into the corporation instead of just having it as an added activity operating in the background (Rake & Grayson, 2009). Kris Gopalakrishnan, the CEO and co-founder of Infosys said: "We live in an increasingly resource-aware and

resource-constrained world. We need to live within our means and not borrow from the future. To build a sustainable tomorrow we need to make our supply chain sustainable today. In fact, I firmly believe that increased sustainability in the supply chain reduces risks and increases profits for all organisations and stakeholders" (UN, 2010:27).

Sustainability is seen to be a way in which businesses can operate causing minimal harm to living creatures (Savitz, 2012). It is regarded as the integration of environmental, social and economic criteria while keeping an equitable balance among all three spheres which aid an organisation for long-term competitiveness (Carter & Rogers, 2008; Goncz, Skirke, Kleizen, & Barber, 2007; Sikdar, 2003). In business the holistic view on SD is becoming more and more strategic because it affects a firm's core in areas such as growth, profitability and thus survival (Kolk & Pinkse, 2008; Corbett & Klassen, 2006).

There are already three characteristics for sustainable business practices which are widely agreed upon. These are: (i) the understanding and acceptance that the ecological system has limits; (ii) that there is an interdependent relationship amongst the economic, social and ecological systems; (iii) that there needs to be equity in distribution of gains between these three systems for sustainability to exist (Ball, Geringer, Minor & McNett, 2010).

Freemans' (1984) stakeholder theory is widely used to aid in the explanation and understanding of environmental sustainability for business as it links to the role business plays. This model differs from the traditional input-process-output business model as it involves the consideration and identification of network tensions caused by the competing demands that exist within the environment in which the business operates. This means that the business focuses on a much wider range of influences, not just the suppliers, owners and employees like previous business models. The best way to show the extensive influences considered in the stakeholder theory is through the diagram below, see diagram 1.1.

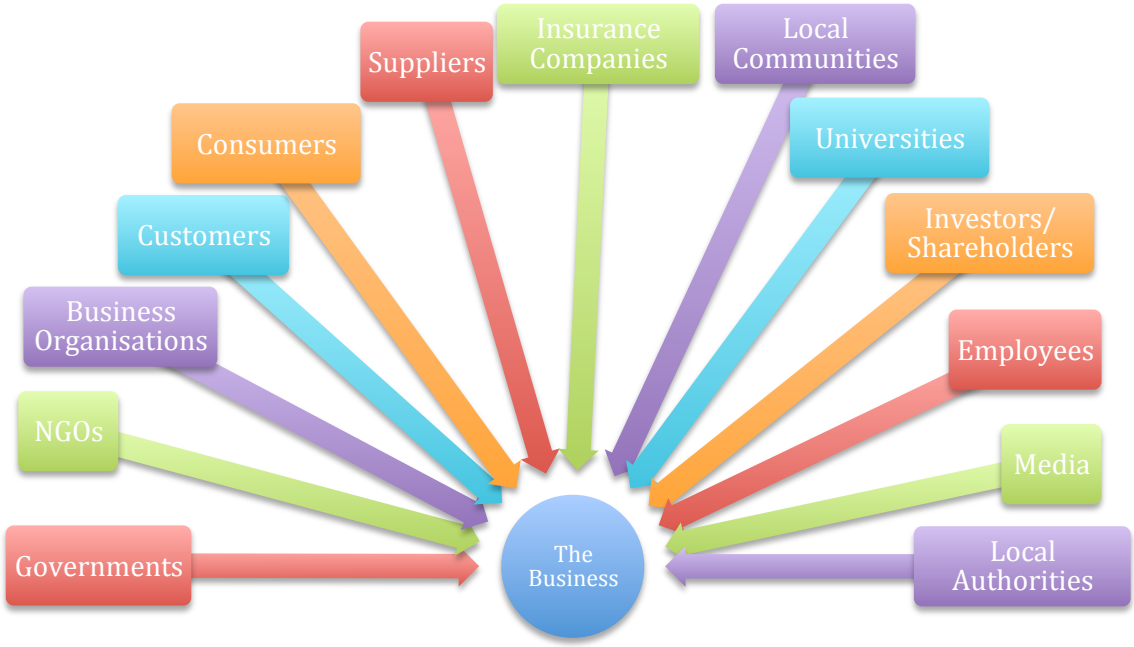

Diagram 1.1: Freeman's Stakeholder Theory

Source: Ball *et al.*, 2010

It is good to see that it is widely accepted that business is impacted and accountable to more than just itself. There are non-governmental organisations (NGOs) like the World Wildlife Fund (WWF), Roundtable on Sustainable Palm Oil and Greenpeace, and some businesses, like Woolworth's Good Business Journey (Woolworths, 2013), that have decided to take action and innovatively change the way that business is conducted to ensure the longevity of the planet. About 80 percent of the 250 largest worldwide companies generated a separate annual sustainability report in 2008, which considered economic, environmental, and social issues, in contrast with 50 percent in 2005 (KPMG, 2008). This now raises the question as to what business can do to help solve, or at least slow down, the degradation of the environment while still conducting successful business operations. Sustainable supply chain management (SSCM) is one possible option to help reduce the severity of the environmental issues.

The UN (2010:2) mentioned that "more and more companies are extending their commitment to responsible business practices to their value chains, from subsidiaries to suppliers. They do so not only because of the inherent social and environmental risks and the governance challenges the supply chain poses, but also because of the many rewards supply chain sustainability can deliver. Indeed, sustainable supply

chain management can be a strong driver of value and success – for business as much as for society. By spreading good business practices around the globe, it has enormous potential to contribute to more inclusive markets and advance sustainable development".

1.3 Supply Chain Management

Supply chain management (SCM) is a term which is becoming more prevalent in business and sustainability alike. Below, the theories, roles and principles will be discussed to aid in the understanding of the importance of a supply chain.

1.3.1 Principles

Over the past 10 to 20 years SCM has become more and more important in how businesses are doing business today (Berning, 2014; Svensson, 2007). Globalisation is one of the major reasons behind this increase, as well as the fact that companies are continuously trying to find more effective ways to organise the flow of its materials and products (Berning, 2014). La Londe and Masters (1994) defined a supply chain (SC) as a set of companies that move materials and products in the forward direction to produce a complete product or service. Subsequently defined the SC as "a set of three or more entities that are directly involved in the upstream and downstream flows of products, services, finances and/or information from a source to a customer" (Mentzer, DeWitt, Keebler, Min, Nix, Smith, & Zacharia, 2001:4). More recently, Blanchard (2010) defined a SC to encompass all activities of a firm from the raw components to the finished product being bought by the end-consumer. Diagram 1.2 below provides a basic impression of a SC from the retailer's perspective.

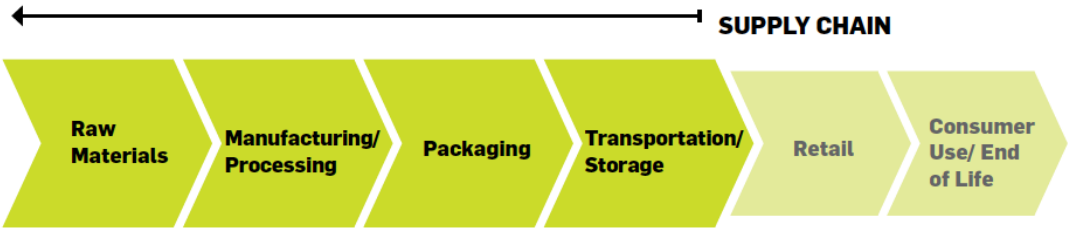

Diagram 1.2 Generic Supply Chain From A Retailer Perspective

Source: UN, 2010.

SCM is the management of goods, services, finances and information between all the different components of production and distribution. In other words, SCM is the management function that takes places between the different business functions from sourcing the raw materials until the customer receives the product or service (Coyle, Langley, Gibson & Novack, 2013). SCM may be regarded as a business philosophy which tries to integrate many different activities, independent actors and resources between the point of origin and the point of consumption (Svensson, 2007).

SCM includes planning, product design, operations, production, handling of by-products, delivery, logistics, payments, and contractual procedures (Schwartz, Tapper & Font, 2008; Berning, 2014). Seuring and Müller (2008) make mention of an important distinction: that the SC has information and materials flowing both up and down the SC. Diagram 1.3 shows that the movement within the SC is more complex than a mere one-directional stream (Miemczyk, Johnsen & Macquet, 2012).

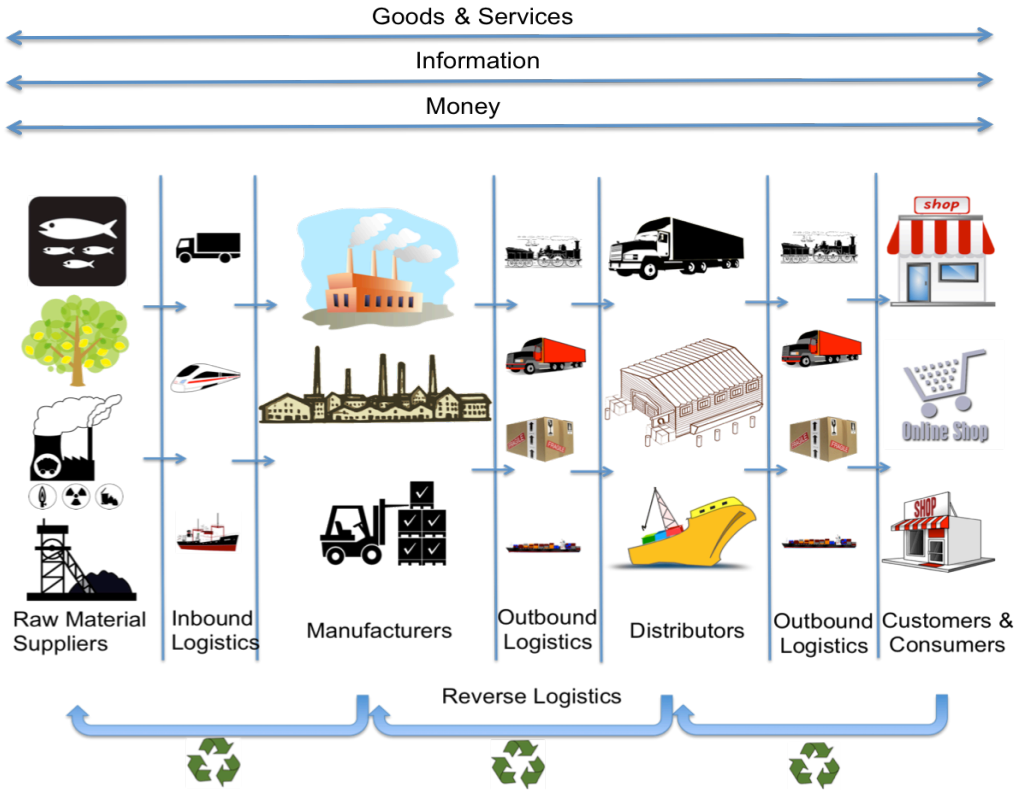

Diagram 1.3: Supply Chain Network

Adapted from; Strydom, Grove, Van Heerden, Nel, Van Scheers & Bothma, 2005; de Villiers, Nieman & Niemann, 2008; Coyle *et al.*, 2013; Govindan, Soleimani & Kannan, 2015.

In the business world today market success and competitiveness can be traced to the competitiveness and efficiency of a firm's SC. It has become a race between the nature of SCs. SCM is therefore extremely relevant in both the successfulness of competing in today's market and in tackling responsible behaviour at every stage of the SC (Ashby *et al.*, 2012).

Examples of SC activities within each segment of the three pillars of sustainability can be seen below in Table 1.1.

Table 1.1: Supply Chain Activities in each of the three pillars of Sustainability

Social	1. Child labour 2. Remuneration of employees in sub tier suppliers 3. Managing the supplier portfolio 4. Anti-corruption efforts
Environmental	1. CO_2 effects across the supply chain 2. Pollution in sub-tier suppliers
Economic	1. Design, innovation and management of the supply network 2. Fair pricing practices down the supply channel

Source: Walker, Miemczyk, Johnsen & Spencer, 2012; UN 2010.

1.4 Sustainable Supply Chain Management

SSCM takes the supply chain and sustainability and creates a new and improved viewpoint on how companies can improve sustainability through the use of their SCs. The theories, principles and uses of SSCM will be discussed below.

1.4.1 Principles

Supply chain sustainability is progressively being acknowledged as a key component of corporate responsibility. Whereby managing the environmental, economic and

social impacts of supply chains, and combating corruption is seen to make good business sense in addition to being the right thing to do (UN, 2010).

SSCM adds sustainability to SCM processes, in order to promote the protection of the economic, social and environmental spheres involved in the business' activities (Schwartz *et al.*, 2008; Linton, Klassen, & Jayaraman, 2007). SSCM needs to broaden approaches to SCM (Svensson, 2007; Seuring & Müller, 2008). SSCM specifically requires cooperation from all partners in the SC (Beske, Land & Seuring, 2014).

SSCM is seen to be the transparent, strategic integration and accomplishment of a firm's economic, social and environmental goals through the systematic coordination of the prominent inter-organisational business processes to improve the long-term economic performance of the firm and its SC (Carter & Rogers, 2008). It is generally perceived that SSCM promotes efficiency and synergy between business partners and their lead corporations, it helps to improve environmental performance, create reduction in the use of fossil fuels and obtain the maximum possible use of sustainable energy sources, minimising waste and achieving cost savings. This synergy is expected to enhance the corporate image, competitive advantage and marketing exposure (Holt, & Rao, 2005; Vermeulen & Ras, 2006). It is said that a sustainable market framework has two major objectives, namely: (i) the reduction of surplus supply; and (ii) the reduction of the reverse supply (Thomchick & Ruamsook, 2010).

Linton *et al.,* (2007) holds that when a firm focuses on SC sustainability, the organisation is addressing sustainable development in its broader sense as the firm is considering the interactions between SC and sustainability. Tshikila (2011:31) mentioned that the whole point of a greening the SC is to "reduce costs while helping the environment".

The objective of SSCM is to grow, create and protect long-term social, environmental and economic value for all stakeholders who are impacted by the activities of bringing a product to the market place (UN, 2010). By seeking to improve environmental, social and economic performance, as well as good governance throughout the SC, a firm not only acts in its own interests but the interests of its stakeholders and the

interests of general society (UN, 2010).

The UN (2010:9) stated that "by virtue of their ongoing business relationships, every company makes direct economic impacts through payments to employees, suppliers and governments and indirect economic impacts through monetary flows throughout supply chains and beyond. Companies which make their supply chains more economically inclusive can support further economic development through for instance job creation and increased incomes. Economic development has secondary impacts on socioeconomic development and the environment and is therefore a critically important aspect of sustainability".

SSCM is a fantastic way to create stakeholder value, which is a broad concept, which implies that a firm has the commitment and responsibility to multiple stakeholders, not just investors and owners of the firm (Svensson, 2007). SSCM is a great tool for firms to use to integrate poor communities as value creating actors into their global SCs (Gold *et al.*, 2013).

SSCM practices are likely to differ between sectors as they depend on individual business characteristics and the nature of their supplier relationships. These factors will impact the type of SSCM activities that a firm partakes in (Schwartz *et al.*, 2008).

SSCM and the integration of sustainability into businesses is an evolving field (Ashby *et al.,* 2012; Pagell, Wu & Wasser, 2010). Svensonn, (2007) believes that the UN report titled *Climate Change 2007: The Physical Science Basis* will ultimately force global society to implement sustainable behaviours across all business sectors. However, at the moment it is unfortunate to see that SSCM is focusing primarily on economic and environmental issues to the detriment of social issues (Schwartz *et al.*, 2008).

There are a few factors needed for SSCM to become a reality, which include (Schwartz *et al.*, 2008; Carter & Rogers, 2008; Ashby *et al.*, 2012):

1. Long-term partnership throughout the SC
2. Consistent volume of operations
3. Fair pricing

4. Top-level commitment
5. Change in company mindset and culture
6. Shared sustainable vision within the firm

All in all, for a firm's SC to be truly sustainable it would, at its worst, ensure that no harm is done to the social or natural system in which it operates, while still making a long-term profit. A truly sustainable SC will lead to a business whose customers are willing and will continue to do business with the firm indefinitely (Pagell & Wu, 2009).

1.5 The Research Aim and Objectives

The aim of this study is to develop a compact checklist for SSCM, which will identify the key ideas needed for two aspects of SSCM. Due to the vast extent of SCM, this study will narrow the focus to sustainable sourcing and the reverse flow of SCs. This study will aid businesses in developing industry or company specific sustainable SCs. The research objectives of this study will be the following:

1. Exploring the sustainability theories available for sustainable sourcing and reverse flow of SCs.
2. Looking at international and domestic sustainable practice theories,
3. Developing a compact and simplified checklist for what sustainable sourcing and reverse flows within SSCM should contain in order to aid environmental preservation.

1.6 Research Design and Methodology

The research design type and methodology used to achieve this study's aim will be content analysis. This study is predominantly a desktop study done through a non-empirical secondary textual data search. This includes the review of books, as well as journals and professional literature that relate to the research aim, which in this case is to identify the key ideas needed for a SSCM framework (Cooper & Pamela, 2011). The use of company specific sustainability reports will be used to compile company-specific case studies for current practices.

In order to analyse the content required for SSCM the key variables that will be looked into include:

1. Sustainable sourcing
    a. Traditional procurement practices
    b. International and domestic trend setting theories in sustainable sourcing.
2. Reverse flows of SC
    a. Traditional reverse-flow theories
    b. International and domestic theories for dealing with the reverse flows.

1.7. Chapter layout

In the next chapters the following areas and aspects will be discussed:

Chapter 2 will cover the theories of SSCM with a deeper look into sustainable sourcing and reverse logistics.

Chapter 3 will assess both international and domestic case studies on the current business practices for sustainable sourcing and reverse logistics.

Chapter 4 will draw a comparison between the theories and practices while also looking at the differences between the firms' commitments.

Chapter 5 will display a checklist of the areas seen in the analysis of the theories and case studies, followed by a report on the shortfalls in the current norm.

Chapter 6 will present a compact conclusion from all the previous chapters, as well as giving recommendations for future research.

1.8. Conclusion

With people now being able to see the impacts that businesses are having on the environment in which they operate, it is time that we look into what is being done and what can be done better. This study aims to do that and point out areas of excellence

and areas of concern by looking at the theory and current practices of big businesses around the world to identify the normal environmental behaviour of these firms and to develop a checklist for other businesses to use as a guide to improve their SC sustainability.

In Chapter 1 we saw how environmental issues are diverse and affect a multitude of people and nations; and that businesses have stakeholders who need companies to act in a responsible manner. SCM is clearly a way in which companies can focus their sustainability efforts towards, as SCM spans the entire journey of a company's product offering. The objectives of this study are clearly laid out and the chapters which follow will draw on the definitions of SD, SCM and SSCM expressed in this chapter.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

A report by the Global Footprint Network and WWF indicated that within the next 43 years mankind will demand twice the amount of resources that our planet can supply. The Global Footprint Network calculated that in 2003, the ecological footprint of humanity was 25 percent larger than the planet's ability to produce these resources. This means that it now takes about one year and three months for the Earth to regenerate what mankind has used in a single year (Mills, 2007).

The worst offenders seem to be the developed countries. For example, the ecological footprint (meaning the land and water a person needs to sustain their lifestyle) in North America is 9.6 hectares, which is compared with 1.4 hectares of the typical African. If the entire world was to adopt the North American lifestyle, it is estimated that four extra planets will be required (Mills, 2007).

Given the above shocking statistics of the future of our planet, Chapter two will address and discuss in detail the multiple theories pertaining to sustainable sourcing and sustainable RL, looking at the development of these theories over time. Aspects like supplier relationships, supplier code of conducts, eco design and waste management will be covered in detail to aid in an understanding of sustainability for businesses.

2.2 Business Linkages With Sustainability

Where does business fit in the world of sustainability? What does business need to do to increase sustainability? Why should business get involved in creating sustainability? All these questions and more will be answered in the section below on what business linkages to sustainability are.

2.2.1 Clear need for transformation

In the last 20 years the world has seen growing pressure being placed on businesses to

take heed of the resource and environmental consequences of their processes and products manufactured (Giunipero, Hooker & Denslow, 2012). There is currently a sustainable movement towards the perception that businesses have the ability to significantly impact the respective ecosystems in which they operate. This is providing numerous motivations for organisational change within business activities (Giunipero *et al.*, 2012). "Business leaders, government, special interest groups, and managerial educators are all calling for increased attention to the environmental performance of businesses" (Tate, Ellram & Dooley, 2012:173). As a result of this attention there has been a growing acceptance that a company's impact encompasses more than a single core process. It is now viewed to encompass the complete product lifecycle, meaning a company is now seen to be responsible for its products "from cradle to grave", therefore a firm is responsible for its product from the product design phase to product disposal phase (Ashby *et al.,* 2012*)*.

Now that the cradle-to-grave view is being taken on by firms it is no longer enough for businesses to merely focus on profits and growth. Environmental and social issues also need to be considered as a priority (Mills, 2007). Mills (2007:21) further states how, many firms see it as surprising that working on sustainability "can make sound entrepreneurial sense", but warns that the demands and challenges of sustainability issues need not be underestimated. Tate *et al*. (2012:173) agree with Mills in stating that "firms are increasingly engaging in environmental practices not just because it is the right thing to do, but because it provides a means to either minimise costs or increase revenues", thus indicating that there is a growing recognition between a company's environmental practices and its overall economic performance (Tate *et al.,* 2012).

Many companies are looking at sustainability as an opportunity to increase their brand promises and reputation by building goodwill amongst their environmentally conscious consumers (Tate *et al.*, 2012). Firms are starting to comprehend the value of the commitment to responsible business practices. A firm can develop a strong reputation with local stakeholders which, in turn, can help build trust and strengthen community ties and establish legitimacy when they are viewed as being a responsible corporate citizen (Timlon, 2011).

In the 21st century, sustainability concerns have moved into the SC. Researchers have begun to consider the product life cycle during material selection. They are looking into the impact of green purchasing on a company's supplier selection, investigating the firm's waste management policy and procedures, as well as its packaging and regulatory compliance (Giunipero *et al.*, 2012). Sustainability in the SC has been given a number of different names in literature including green supply chain and closed loop supply chain (Giunipero *et al.*, 2012). For sustainability to be considered in the business sphere, environmental purchasing, remanufacturing, recycling, and other green supply chain management measures like eco design have to contribute to the improvement of economic performance and competitiveness (Rao & Holt, 2005).

It is important to note that many firms outsource operations of the SC. Subsequently a firm's aggregate environmental impact depends also on the environmental impact of the outsourced members of its SC network (Tate *et al.*, 2012).

2.2.2 Stakeholder theory

As mentioned in Chapter 1, stakeholder theory is a well-established theory that has been used to change the way businesses do business. It has led to businesses taking a broader view on their business activities to see who is affected by their activities. The word stakeholder occurs many times in articles pertaining to business sustainability because, stakeholders are key players involved in the demand for changes in business practices. For this reason, it is important that stakeholder theory be discussed.

The definition for stakeholders is "any group or individual who can affect or is affected by the achievement of the organisation's objectives" (Freeman, 1984:46). Through engagement with stakeholders, an organisation can find effective guidance in the management of a wide variety of issues (Berning, 2014). Stakeholders include customers, shareholders, investors, suppliers and employees.

Stakeholders can be divided into four different categories. The various categories are displayed in Table 2.1 below including which stakeholders fit into each category.

Table 2.1 Six Stakeholder Categories

Categories	Includes
Primary social stakeholders	shareholders and investors, employees and managers, customers, and suppliers
Primary non-social stakeholders	the natural environment, future generations and non-human species
Secondary social stakeholders	the government, media, competitors and other institutions.
Secondary non-social stakeholders	environmental interest groups and animal welfare organisations
Market stakeholders	customers, suppliers, creditors, employees
Non-market stakeholders	the media, governments, communities and the general public
Source: Berning, 2014	

The varied stakeholder groups all have different relationships with the organisation and every decision made by the business has an influence on the stakeholders. This is why stakeholder engagement and effective management of stakeholder relationships is of vital importance to businesses (Berning, 2014).

Investors and customers are progressively expecting that businesses understand and manage impacts in their SCs. Stakeholders want to be sure that companies are aware of and are lessening the key risks affecting their supply chains. In addition, they want to know how firms are creating value from SC sustainability (UN, 2010).

Upon further examination of the stakeholder theory one can divide the different stakeholders into the different areas of the organisation's SC. This division can be seen below in Table 2.2.

Table 2.2 Eight Different Types of Stakeholders

Company Internal Stakeholders	The functional management	Responsible for implementing the corresponding functional strategies of a firm, like its purchasing function

	The corporate management	They are expected to be particularly a salient stakeholder for the implementation of sustainability, due to their hierarchical power. Their requests institute an urgent driver for all functional activities. For instance, a corporate management's decision to consider sustainability could occur as a result of either a new sustainable strategy development, or correspond with the change in a corporations values and culture
	Purchasing's internal customers	Includes departments that receive products and services through purchasing.
Supply Chain Internal Stakeholders	Customer	They have a vital role in all market-oriented organisations; this is due to the fact that the firm's income is obtained through customers' buying decisions
	Suppliers	Suppliers are a vital stakeholder when looking at purchasing. Research findings on suppliers' link to the demand for changes towards sustainability are not very clear but most lean towards them having no influence in the creation of demand
Supply Chain External Stakeholders	Competitors	Their strategies and activities as crucial elements of the market environment for any business. Their strategies should be incorporated and reflected in business strategies
	Regulators' authority	They have the ability to severely influence business activities through the introduction and removal of regulations

	NGOs	NGOs are seen to be objective and honest, the majority of them have a good reputation with a high level of trustworthiness. These attributes have provided them with the required power and urgency to represent a salient stakeholder
Source: Schneider & Wallenburg, 2012; Sarkis, 1998; Sharma & Henriques, 2005; Carter & Jennings, 2004; Alfonso-Lizarazo, Montoya-Torres, & Gutiérrez-Franco, 2013.		

Companies should devote time to understanding the expectations of their stakeholders and include the ideas and expectations of activist organisations, issue experts, academics, community groups, as well as the firm's suppliers. This is advised due to the potential benefits that could arise from seeking input from customers, investors and a broad range of stakeholders. Customer and investor demands are one of the primary drivers for SC sustainability programmes. Insights from these stakeholders help to shape the programmes to ensure they create the maximum return for the business (UN, 2010). Asking for stakeholder opinions will aid in the creation of stakeholder value and positive relationships. Firms with good stakeholder relationships will have the ability to gain competitive advantage over competitors due to the reduction in agency and transaction costs (Jones, 1995). Schneider and Wallenburg (2012:248) agree by stating that "stakeholder management is a key success factor for both environmental management and social sustainability".

In recent years, many more stakeholder groups are demonstrating a willingness to partner with organisations. Many stakeholder groups are highly knowledgeable about sustainability issues and can thus provide useful partnerships. They can assist in the understanding of the context for sustainability challenges, help in the designing of effective responses to the challenges of sustainability, and help by acting as the local implementation partner. Furthermore, they can bring legitimacy and resources to the effects of SC sustainability (UN, 2010).

Stakeholders are often the first to identify developing social, environmental and

economic issues in the SC. Firms that engage regularly with stakeholders have the chance to take a pre-emptive approach to issues and to form a partnership with stakeholders, instead of discovering the issues through an activist campaign. The prompt identification of issues through stakeholder engagement may potentially help firms take leadership on how to deal with the issue, in comparison to their competitors (UN, 2010). This demonstrates what Asif, Searcy, Zutshi and Fisscher (2013) wrote; that proper stakeholder management is vital for driving sustainability performance.

2.2.3 Triple bottom line

Many studies done on sustainability state that there is one concept that appears to be central in helping to operationalise sustainability. This is the triple bottom line (TBL) approach (Seuring & Müller, 2008). Elkington (2004) originally coined the TBL term in 1994 as a means to address the environmental agenda in a more integrated manner. The TBL consists of social, environmental and economic measures. The TBL entails that businesses comprehend the importance of the balance between the protection of society, the environment and economic growth, and taking these three areas into account (Berning, 2014). According to Elkington (2004), the three areas are entwined and of equal importance. In order for organisations to achieve TBL success, they should focus on all three pillars and not just on one or two (Berning, 2014).

Social sustainability is involved in the management of social resources, which include institutions, relationships, people's skills and abilities and social values (Sarkis, Helms & Hervani, 2010). Social equity is a vital component of social sustainability; it requires that all members of society have equal access to opportunities and resources (Bansal, 2005). This statement extends to include the fair and equitable treatment of a firm's employees (Krause, Vachon & Klassen, 2009). The social sphere of the TBL is also concerned with injustice, poverty, and human rights (Krause *et al*., 2009). At the commercial level, this entails that companies and their suppliers must undertake actions "to add value by increasing the human capital of individuals, and the societal capital of communities" (Ashby *et al.,* 2012:506).

Elkington (2004) broadens the TBL literature by identifying seven drivers which TBL depends on. These drivers, all business related, are: markets, values, transparency, life-cycle technology, partnerships, time and corporate governance. The TBL approach suggests that at the intersection of environmental, social and economic performance, the organisational activities will be sustainable. These activities will not only positively affect society and the natural environment, but will also result in long-term economic success and competitive advantage for the organisation (Carter & Rodgers, 2008), see Diagram 2.1 below. True sustainability occurs at the intersection of all three goals when a firm clearly and systematically incorporates environmental, social and economic goals in the development of strategic vision and long-term objectives (Elkington, 1998; Carter & Rodgers, 2008).

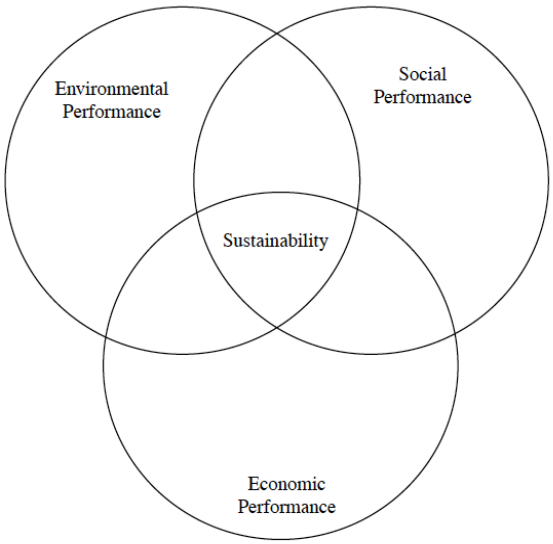

Diagram 2.1 Sustainability due to the Triple Bottom Line

Source: Carter & Rogers, 2008.

2.2.4 The benefits of sustainability movement for businesses

When companies embark on their sustainability journey they partake in process, market, product and/or service innovation, which allows for the discovery of new business processes, as well as new sources of revenue. Through doing something progressive for the community and the environment, they create competitive advantage. Competitive advantage will place companies ahead of their competitors in the eye of the public. This in turn, contributes to enhanced employee satisfaction, stakeholder relationships, and effective risk management (Berning, 2014).

Ries, Bilec, Gokhan and Needy (2006) highlighted that even though the short-term expenses for sustainable changes are high, the long-term savings surpass the expenses. Savings include maintenance costs, safety costs, energy costs, operational costs, increased market value, increased employee productivity and reduced health risks.

Ultimately "financial benefits of sustainability are one of the most prominent factors in an organisation, and that the presence of sustainability initiatives and sustainable practices are of considerable importance for doing business." (Berning, 2014:37). The potential economic benefits from social and environmental SC activities are great; Carter and Rogers (2008) mentioned the following benefits:

- Reduced health and safety costs
- Safer warehouse and transportation
- Lower labour turnover costs thus lower recruitment costs
- Better working conditions which reduce labour costs due to a reduction in absenteeism of personnel
- Cost savings due to reduced packaging waste and the ability to design for disassembly and re-use
- Proactively shaping future regulation, as businesses that address sustainability concerns have an impact on government regulations. When the Government of a nation models their regulations based on a firm's existing SC is an example of this
- Enhanced business reputation: incorporating sustainability makes a firm more attractive to employees, shareholders, customers and suppliers.

2.3 Sustainable Theories

Below are three sections dealing with the sustainable theories which exist for SSCM, sustainable sourcing and reverse logistics. They will be discussed in detail in the following sections.

2.3.1 Sustainable supply chain management

Researchers are starting to advocate radical changes for the management of SCs. They are suggesting changes away from the current profit-only aims of SCs. Threats that have arisen from global warming and climate change have made more environmentally friendly SCs a higher priority. This has led to the more recent attention which academics are placing on addressing sustainability issues in supply chain management (SCM) (Govindan, Azevedo, Garvalho & Cruz-Machado, 2014).

SC professionals are in an exceptional position to have a huge impact on sustainability practices. Activities like the reduction of packaging used, the improvement of working conditions in warehouses, the use of more fuel-efficient transportation, and the requirement for suppliers to partake in environmental and social programmes, are just a few examples of many activities which, can reduce costs while also improving a business' reputation (Carter & Rodgers, 2008). Supply chain performance is usually concentrated on financial and operational performance measurement (Gold *et al.,* 2013). However, for the SC's performance to be sustainable it is ideal if it can be based around the principle of TBL (Gold *et al.,* 2013).

2.3.1.1 The uses of sustainability theories in the supply chain

Companies have been exploring ways to reduce, re-use and recycle for some years. These activities have ranged from costly initiatives such as constructing leadership in energy and environmental design certified buildings, to the establishing of energy-efficient data centres and supporting environmental practices in the workplace. A developing area in corporate environmentalism is the green supply chain which is also called sustainable SC. Corporations on the leading edge of this trend are focusing on the selection of suppliers not only based on the old-fashioned criteria of quality, reliability and price, but also on how well they conform to environmental issues and the corporate social responsibility initiatives (Tshikila, 2011).

The approach taken to SSCM differs both across and within sectors, depending on a corporation's characteristics and specifically on the nature of the firm's operator-supplier relationships. This is visible in the relative stability and formality in the contracting and purchasing decisions. These elements will influence the type of

SSCM activities a company will engage in, which vary from informally discussing sustainability issues with suppliers, all the way through to a more resource-intensive activities, such as the development assessment of procedures and guidance of materials (Schwartz *et al.,* 2008).

SSCM allows firms to become more competitive and sustainable in an unpredictable market (Govindan *et al.,* 2014). When SC sustainability is coupled with economic objectives in the development of a clear, long-term strategy, the SC activities can actually create a longer-lasting and less imitable set of processes (Carter & Rogers, 2008).

2.3.1.2 The principles of sustainable supply chain management

SSCM practices can be seen in five different categories depending on the firm's intention. These categories are discussed below (Beske *et al.,* 2013);

1. **Strategic orientation:** The first category covers the strategic orientation of a firm. This is where the firm's strategic values are focused. The TBL customarily guides businesses following a sustainability strategy. This category includes the SSCM practices of TBL and SCM.
2. **Continuity**: The second category covers the structure of the supply network. This encompasses the way the SC partners repeatedly interact. It is worth noting that the methods used for the selection of qualified partners, the building of long-term relationships and the development of SC partners are found here (Pagell & Wu, 2009; Gold, Seuring & Beske, 2010). This category incorporates the SSCM practices of long-term partnerships, partner development and partner selection.
3. **Collaboration**: The third category connects the structural features to businesses processes. Structural decisions are made regarding how to technically and logistically combine the SC partners and the quality of information shared (Vachon & Klassen, 2008). Joint development wishes to collectively improve new products, technologies and processes. This classification includes the SSCM practices of logistical integration, joint development, enhanced communication and technical integration.
4. **Risk management:** The fourth category leads firms to adopt numerous methods of risk management to lessen the risks that firms can be subjected to

if sustainability issues are not addressed (Seuring & Müller, 2008; Holt & Ghobadian, 2009). This category includes the SSCM practices of standards and certification, individual monitoring, and pressure group management.

5. **Pro-activity towards sustainability:** There is a vast array of stakeholders found in the category of SSCM. By actively engaging with stakeholders, companies are able to foresee further pressure and thus benefit from stakeholder knowledge (Pagell & Wu, 2009). This category includes the SSCM practices of learning, stakeholder management, innovation and life-cycle assessment.

The UN (2010:7) stated that "the objective of SC sustainability is to create, protect and grow long-term environmental, social and economic value for all stakeholders involved in bringing products and services to market. Through supply chain sustainability, companies protect the long-term viability of their business and secure a social licence to operate". There are 10 principles upon which SSCM is firmly based. These 10 principles are divided into four segments namely human rights, labour, environment and anti-corruption (UN, 2010). See a full breakdown in the Table 2.3 below.

Table 2.3: Ten Principles of Supply Chain Sustainability
Human Rights
Principle 1: Firms should respect and support the protection of international human rights;
Principle 2: Firms need to make sure that all areas of their SC are not complicit in human rights abuses.
Labour
Principle 3: Firms should encourage the freedom of association and the recognition of the right to collective bargaining;
Principle 4: Firms should remove of all forms of forced and compulsory labour;
Principle 5: Firms should eliminate all forms of child labour
Principle 6: Firms should be active in the eradication of discrimination in respect of employment and occupation.
Environment
Principle 7: Firms should encourage a precautionary approach to environmental challenges;
Principle 8: Firms should start initiatives to promote greater environmental responsibility;
Principle 9: Firms should inspire the diffusion and development of environmentally friendly technologies.
Anti-corruption
Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery.
Source: United Nations. 2010.

In order for a firm to engage in SSCM it needs to implement new practices into the company. Penfield (2009) stated that there are seven steps for companies to take to implement SSCM discussed below;

1. **Culture** is the first step. Many businesses are totally fixated on short-term results. Over time our current society has transformed into a disposable society. Unfortunately, our business leaders have been trained in such a manner that they conduct business activities from a throwaway viewpoint. The general assumption among these executives is that “if it is within the law, we

are allowed to do it regardless of the repercussions to the environment". (Penfield, 2009). This is the current cultural issue, which must be changed.

2. The second step to establishing sustainability within a company is to **educate** the whole company on sustainability. It is imperative to show all the employees what the benefits of sustainability are and what it can do for the company and the environment around them.
3. The third step towards a SSCM is to complete a **sustainability audit** of the company's SC. This is done to determine a baseline measure for where the firm is today in order to gauge where the firm needs to go and as a way to see how much change has been achieved after new measures have been implemented.
4. The sustainability audit results should aid the firm with the fourth step, which is **determining the goals and objectives** for the SSCM. When developing goals and objectives, the firm must make sure its goals are SMART (specific, measurable, attainable, relevant, and timely) and that they are concentrated on sustainability. A firm should have goals on reducing its carbon footprint, the reduction of energy consumption, the use of recycled material in its products, the use of renewable resources and the elimination of waste. These set goals need to sense to the individual firm. The firm needs to lay out a detailed plan with incremental steps towards its sustainability goals. These goals must be incorporated into the overall objectives of the firm.
5. After the development of sustainable goals for the organisation, the fifth step is to **determine what actions need to take place** in order to meet these objectives. An action plan must be developed, with different project areas and assignments being allocated to help meet the company's sustainable goals. The aim is to achieve a sustainable SC, but this will not happen overnight. It is a long, gruelling process and one that will take years to fully change and integrate.
6. Once the projects and assignments are all in place the next step is **to measure the sustainability progress**. Measures must be in taken in order to see how effective the different projects and assignments were. These sustainability findings must be announced and discussed in company meetings. The importance of this is that the results are being measured so as to enable the driving of improved results. When the predetermined results are met the need

arises to raise the bar and focus on getting more sustainability into the SC processes. If, when the measures are taken and the results indicate shortfalls, the firm needs to locate what is preventing it from reaching its goals.

7. The last step on the journey to sustainability is **benchmarking.** This is done to assess where the company is situated in regards to sustainability within its industry or business environment. Even though each firm has its own goals, projects and measures in place, identifying what other companies are trying to achieve in regards to sustainability is necessary. What processes are they doing that could be incorporated by other organisations? Benchmarking is therefore done in order to leverage the learning which occurs in other companies and can be incorporated. This will in turn benefit the greater society.

Segmentation is an important area in SSCM as it is used to assess where best the allocation of resources can improve sustainability efforts. Segmentation of the SC can be done after there is a complete understanding of the firm's SC. By segmenting the SC one is able to determine how best to commit resources to improve sustainability. It allows firms to focus on the most critical elements of their SC. Good segmentation is to find the balance between acknowledging that a certain amount of risk will always exist but that certain risks need to be addressed primarily to avoid negative impacts to the business and society. There is a multitude of different criteria to consider in SC segmentation, these including, but not limited to (UN, 2010): (1) risk to society, (2) business risk, and (3) risk to economic development.

Both business and societal risk are influenced by spend, country, category, tier, nature of transaction (UN, 2010). The explanation of each of these factors can be seen in Table 2.4 below.

Table 2.4 Business and Social Risk Factors

Influence	Explanation
Spend	Refers to which suppliers a company has spent the highest amount with. It is important to include both the amount spent directly and indirectly, and see where the most influence is held
Country	Refers to which countries a company's suppliers operate in, and which of those places have high risks caused by weak legal and regulatory structures, high levels of corruption and so forth
Category	Refers to which of the suppliers are most critical to the company
Tier	Refers to which suppliers sell directly to your company, and which are sub-tier suppliers
Nature of transaction	Refers to whether or not the transaction contributes to the increase transparency and accountability in the supply chain. For example, outsourced agents, labour, brokers, and middlemen have the potential to create many gaps in awareness, knowledge and influence.
Source: United Nations, 2010	

In order to reduce the impact and effect of SC risks, co-operation and communication between SC members is needed to achieve a proactive sustainability approach (Seuring, 2008; Hagelaar & van der Vorst, 2002). "An initial step toward achieving holistic sustainability objectives lies in a corporation's orientation toward sustainability" (Gold *et al.,* 2013:786). Diagram 2.2 below is a visual representation of the framework for SSCM that Gold and his co-authors developed in 2013 with a few key aspects to each area of the framework.

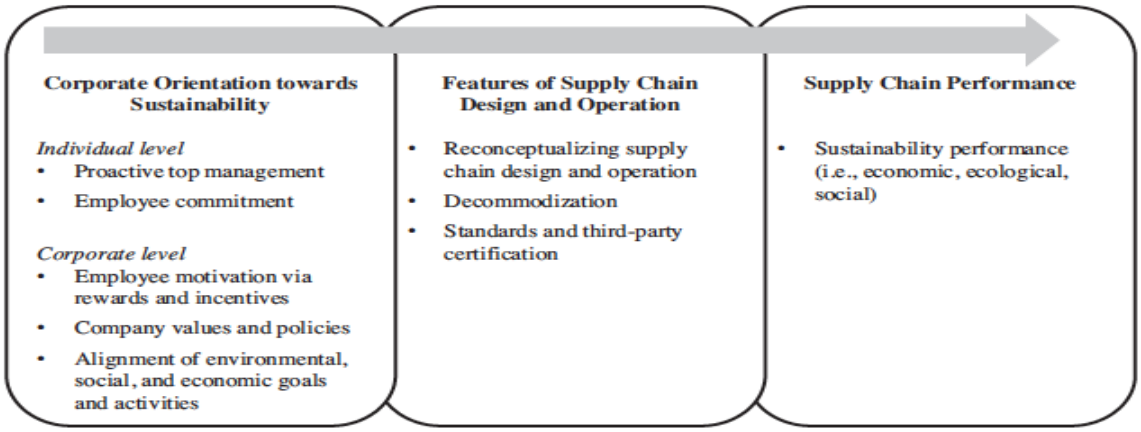

Diagram 2.2 Model of Sustainable Supply Chain Management

Source: Gold, *et al.,* 2013

The first step towards realising a firm's holistic sustainability objectives lies within the firm's orientation toward sustainability (Gold *et al.,* 2013). On the individual level, research shows that the proactive stance of top managements toward the environment leads the way for the inclusion of ecological issues in SCM (Pagell & Wu, 2009). An organisation's staff is going to be more likely to be environmentally friendly in their actions if the supervisory encouragement is ecologically inclined (Ramus & Steger, 2000). Hence, managerial support enhances the establishment of sustainable behaviour among all staff members. This is indispensable because otherwise sustainability issues run the risk of being neglected in day-to-day activities. Ramus (2002) highlights the importance of an environmental vision. He also mentions how vital it is that the environmental vision of a firm be implemented with policies and a participative-style communication to aid in the sharing of sustainability concerns across the organisation.

What Gold and his co-authors (2013) mentioned above about the commitment of top management is reiterated in the UN, 2010-report which emphasises is that "successful implementation of supply chain sustainability programmes requires three levels of internal responsibility" as illustrated in Diagram 2.3 below (UN, 2010:43).

Diagram 2.3 The Elements of internal responsibility for Supply Chain Sustainability.
Source: UN, 2010.

Ramus (2002) noted that on the corporate level the use of a reward-and-recognition programme is an effective means to encourage staff to act sustainably. This agrees with what Pagell and Wu stated in 2009. They mentioned that inherent motivation in

general is not enough to change and lead the behaviour of every staff member. They further suggested that by complementing the inherent motivation of the staff with extrinsic measurement and reward systems that employees' behaviours may then aid in the achievement of sustainability outcomes (Pagell & Wu, 2009). Without organisational incentives, staff members are likely to ignore sustainability issues and focus instead on more traditional business goals. Additionally, there is confirmation that incentives and inherent motivation must be backed by a firm's corporate commitment to sustainability, this is reflected in the written environmental policy (Gold *et al.,* 2013).

The features of supply chain design and operation in regards to SSCM include the fact that the corporate orientation of an organisation needs to be implemented through the corresponding features within the SC design and operation (Gold *et al.,* 2013). Reconceptualising SC design and operation is often deliberated as a way to enhance the sustainability performance of a corporation (Gold *et al.,* 2013). This comprises of both upstream and downstream collaboration within the SC and potentially the inclusion of non-traditional chain members such as NGOs (Gold *et al.,* 2013; Pagell & Wu, 2009).

What Gold and his co-authors (2013) mentioned above about the need to reconceptualise the SC design and operation is reiterated in the UN, 2010 report which discusses that to "support sustainability objectives and enable suppliers to meet expectations, alignment between a wide variety of functions is required". The report adds that SCM personnel, logistics, product design, marketing, business development and sales all have an impact on supply chain sustainability. Businesses need to look into how they can bring together cross-functional representatives; this is illustrated in Diagram 2.4 below. "It is important that individual roles and responsibilities within the business are specified so that individuals can assume responsibility for implementing and meeting the vision and milestones set out by executives. These objectives should be backed by incentives and consequences. Sustainable supply chain personnel should also provide input to strategic planning processes in functions throughout the company" (UN, 2010:48).

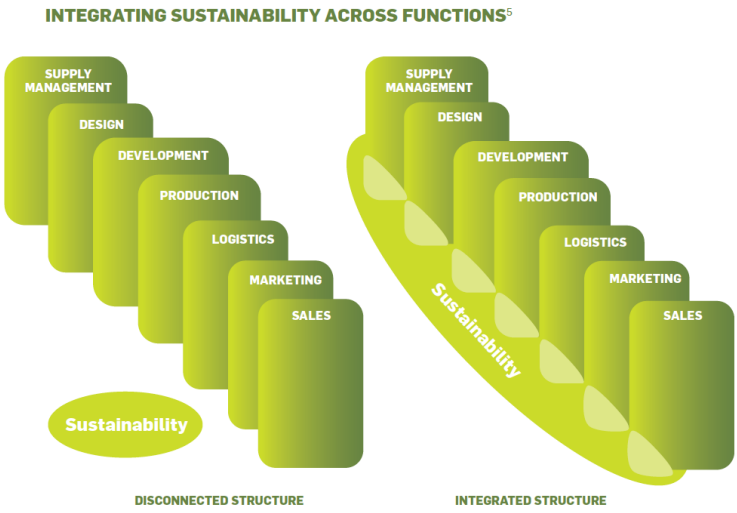

Diagram 2.4 Integrating Sustainability Across Functions

Source: UN, 2010

To monitor the sustainability of the entire SC a firm will normally demand information on its supplier's achievements in all the three spheres of sustainability namely social, environmental, and economic (Muller, dos Santos, & Seuring, 2009). For the social and environmental performance, firms tend to rely on third-party standards and certificates to aid in the reduction of reputational risks and in order to safeguard the firms' minimum standards. Certification schemes like the International Organisation for Standardisation (ISO) are being used regularly in traditional SCM to enhance different performance goals through constant process improvements (Sroufe & Curkovic, 2008). In SSCM, standards and certificates are promising tools, which are bringing environmental and social issues to the attention of a broader audience. Social standards, such as Social Accountability SA8000 (Ciliberti, de Groot, de Haan, & Pontrandolfo, 2009) and ISO 26000 (Hahn, 2012), are used, but unfortunately they are a lot less common in corporate management processes and plans (Gold *et al.,* 2013).

2.3.1.3 Drivers and barriers of sustainable supply chain management

If one looks at what motivates companies to implement SSCM one can note drivers like cost reductions, reputational and brand developments, competitive advantage and customer demand. When looking at what slows and discourages investments in SSCM, the complexity of sustainability, the high cost of implementation and the misalignment of strategies are all contributing factors. In table 2.5 below one can find

the results acquired from multiple papers pertaining to SSCM. After looking into what drives companies to seek and implement a sustainable SC and what barriers are faced by the companies Table 2.5 was compiled to give a concise overview of what drivers and barriers can be expected.

Table 2.5. Drivers and Barriers of SSCM

Drivers of SSCM	**Barriers of SSCM**
Cost Reduction (Ojo, Mbowa & Akinlabi, 2014; Tshikila, 2011; United Nations, 2010; Govindan *et al.,* 2014; Crespin-Mazet & Dontenwill, 2012; Giunipero *et al.*, 2012)	Challenge of encompassing all areas of sustainability (UN, 2010; Fleury & Davies, 2012)
Managing Business Risks (UN, 2010; Styles, Schoenberger & Galvez-Martos, 2012a)	Lack of sustainability standards and regulations (Giunipero *et al.*, 2012).
Competitive advantage (Ojo *et al.,* 2014; Seuring & Müller, 2008; Giunipero *et al.*, 2012)	Lack of commitment from top management (Giunipero *et al.*, 2012).
Stakeholder pressure (Tshikila, 2011; Seuring & Müller, 2008; Hall, 2000; Styles *et al.*, 2012a)	High Costs (Seuring & Müller, 2008; Giunipero *et al.*, 2012; Schwartz *et al.,* 2008)
Regulations and Legal Pressures (Tshikila, 2011; Seuring & Müller, 2008; Hall, 2000; Giunipero *et al.*, 2012; Styles, *et al.*, 2012a; Styles, Schoenberger & Galvez-Martos, 2012b)	Not enough information and communication in the supply chain (Seuring & Müller, 2008)
International standards (Tshikila, 2011)	Lack of awareness (Ojo *et al.,* 2014)
Moral responsibility (Tshikila, 2011; UN, 2010)	Coordination Complexity (Seuring & Müller, 2008)
Socially responsible investors (Tshikila, 2011)	Supplier resistance to change (Ojo *et al.,* 2014)
Mainstream Models and ratings (ie. Dow	Misalignment of strategic goals

Jones Sustainability Index, Goldman Sachs and Financial Times/London Stock Exchange (Tshikila, 2011)	(Giunipero *et al.*, 2012; UN, 2010)
Business continuity (UN, 2010)	Lack of resources (Ojo *et al.,* 2014)
Brand Image development and reputation (Ojo *et al.,* 2014; Tshikila, 2011; UN, 2010; Carter & Rodgers, 2008)	Tension between companies objectives and commitments to sustainability (UN, 2010)
Increase Efficiencies (UN, 2010; Govindan *et al.,* 2014)	True understanding of what sustainability means (Carter & Rodgers, 2008)
Reduced Waste due to product design and packaging (Carter & Rodgers, 2008)	
Reduction of staff turnover (Carter & Rodgers, 2008; Govindan *et al.,* 2014; Hall, 2000)	
Customer Demands (Seuring & Müller, 2008; Hall, 2000; Giunipero *et al.*, 2012)	
Environmental and Social Pressures ie NGOs (Seuring & Müller, 2008; Hall, 2000; Styles *et al.*, 2012b)	
Technological Improvements (Hall, 2000)	
Personal commitment by management (Crespin-Mazet & Dontenwill, 2012; Giunipero *et al.*, 2012)	
ISO and product certification (Giunipero *et al.*, 2012; Styles *et al.*, 2012a)	
Corporate Social Responsibility (Styles *et al.*, 2012a)	

2.3.2 Sustainable sourcing theories

While we have established that the successful implementation of corporate sustainability relies heavily upon the aligned efforts and involvement of several departments (Handfield, Walton, Seegers, & Melnyk, 1997; Wu and Dunn, 1995), the

function of purchasing has a great ability to contribute to a corporation's overall sustainability (Tate, Ellram & Kirchoff, 2010). This is mainly due to the fact that it is located at the starting point of the materials flowing into the corporation (Carter, Ellram & Ready, 1998; Porter and van der Linde, 1995). An organisation is only as sustainable as its upstream SC (Handfield, Sroufe & Walton 2005; Krause *et al*., 2009). Sustainable procurement is gaining importance and attention on the agendas for purchasing not to mention the fact that supply managers are beginning to demonstrate corporate social responsibility (CSR) in their SCs (Walker *et al.*, 2012).

2.3.2.1 The principal of sustainable sourcing

Before we can fully understand what sustainable procurement is, one needs to understand what procurement is. For practicality we group purchasing, procurement and sourcing together (Miemczyk *et al.*, 2012*)*. Procurement is defined by the Collins Dictionary of Business (2006) as the act of buying equipment or raw materials. Miemczyk, Johnsen and Macquet (2012) mentioned that procurement includes the decision to either make or buy. The Dictionary of Industrial terms (2012) adds that "procurement includes such duties as specification development, value analysis, supplier market research, negotiation, buying activities, contract administration, and perhaps inventory control, traffic, receiving, and stores". Traditionally, strategic sourcing choices were based on a cost differential. But now, this cost-based method is too narrow for sustainable sourcing decisions (Timlon, 2011).

"Sustainable procurement is procurement that is consistent with the principles of sustainable development, such as ensuring a strong, healthy and just society, living within environmental limits, and promoting good governance" (Walker & Brammer, 2009:128). Seuring (2004) stated that SC sustainability requires a shift away from simple procurement towards integrated SCM, which is where businesses consider multiple upstream and downstream actors. Sustainable procurement has been defined as the pursuit of SD objectives through the purchasing and supply process (Walker & Phillips, 2009). Pagell, Wu and Wasserman (2010) agree with Seuring (2004) that sustainable sourcing is the management of all aspects of the upstream factors of the SC to increase the performance of a firm's TBL agenda. This is evident in Schneider and Wallenburg (2012) whose simplified definition states that sustainable sourcing considers economic, environmental and social principles at the same time in sourcing

decisions.

Sustainable procurement is important, as it "is consistent with the principles of sustainable development, such as ensuring a strong, healthy and just society, living within environmental limits, and promoting good governance" (Walker & Brammer, 2009:128). Green purchasing is considered to have the highest potential to address sustainability within SCM because it is based on non-altruistic market principles, i.e. transforming purchasing in SCM makes good business sense and is more readily practicable than other approaches (Ashby *et al.,* 2012). Sustainable sourcing is presently the most developed area of environmental sustainability, potentially because of its focus on a single process (Ashby *et al.,* 2012).

Due to the fact that the social sphere is often skipped over by many firms, it is important to note the definition of socially responsible sourcing (SRS), and what it includes. SRS focuses on the upstream management of the SC, it is an important aspect of the broader SSCM agenda (Zorzini, Hendry, Anisul Huq & Stevenson, 2013). SRS has also been defined as the incorporation of stakeholder-advocated social issues in purchasing (Maignan, Hillebrand & McAlister, 2002) and the use of a firm's purchasing power to procure products, which have a positive impact on society (Drumwright, 1994). It is no longer enough for a corporation to simply be profitable; in order for it to flourish it must also be responsible for the social wellbeing of the community and its employees (Zorzini *et al.,* 2013). The social aspects of sourcing deals with ensuring the use of ethically sound suppliers. This means that there needs to be buyer relationships with suppliers, that there is a code of conduct in place, agreements with suppliers on the prevention of child labour, and policies for how to deal with minority-owned suppliers (Schneider & Wallenburg, 2012).

SRS endeavours to bring about advantageous social change through its buying behaviour and is aimed at addressing a range of issues, including safety, community, diversity and human rights which form part of a firm's non-economic buying standards (Drumwright, 1994; Leire & Mont, 2010). Carter and Jennings (2002) and Carter (2004) identified the following social issues to be considered in SRS:

- Human rights
- Community

- Safety
- Diversity
- Ethics
- Respect for local democratic institutions
- Social impact to customers
- Animal welfare concerns

Yet, while corporations may recognise their role in SRS, many purchasing managers do not know how to systematically and permanently integrate social issues into buying decisions (Maignan *et al*., 2002).

It is important for companies to be aware of the social performance of their SC partners. This is due to the high risk of adverse publicity and the lasting damage to both the brand and revenue that can occur when unethical business practices emerge in the news media. This has been evidenced in tragedies in which multiple workers were either killed or injured in Bangladeshi factories supplying clothes to Wal-Mart, Sears and Inditex in 2013. In each case, there has been long-term damage to their brands. Social malpractice is prone to having a broader, more destructive effect than just the original bad press news stories. There are, however, many inherent challenges to incorporating social interests into procurement decisions (Zorzini *et al.,* 2013). Sourcing has the ability to create vast amounts of value for both the global economy and the companies (Farrell, 2005). This is an outcome of a globally connected business environment. There is subsequently a rise in political and global risks due to global views on indigenous peoples' rights, intellectual property, child labour, forestry and conservation of biodiversity (Timlon, 2011).

Sourcing businesses are subjected to growing scrutiny from stakeholders concerning the implication of their sourcing decisions and there is a focus on emerging country markets. In the near future, if not already the case now, management professionals will find themselves in a dilemma with regard to how to prioritise the sustainability criteria and low-cost economics (Timlon, 2011). Many companies outsource their operation to suppliers; this means that a company's environmental impact includes all members of its SC which means that the sustainability of its supplier network has an impact on the firm's sustainability. Consequently, the environmental impacts of suppliers on the footprint of products are even greater than the company's economic

impact on a product (Tate *et al.,* 2012).

Anand Mahindra, the vice-chairman and managing director of Mahindra & Mahindra Limited said: "The purchasing power of a corporation can become a unique driver for bringing about positive change in society. Companies must use this power to achieve a purpose and make their supply chain a vehicle for inclusive growth. In a developing economy like India, the bulk of the workforce is employed in the unorganised sector, which often constitutes the last mile of the supply chain. If this workforce is exposed to the advantages of good and clean business practices, it would make a great impact on their lives and on the wellbeing of the nation" (UN, 2010:15).

Sustainability has had an impact on purchasing practices in the following ways: first, purchasers need to go further than just the financial metrics. They need to monitor the new risks such as employees' security, waste of resources and pollution (Carter & Rogers, 2008) and the influence of their actions on local communities (Foerstl, Reuter, Hartmann & Blome, 2010). Second, the buyer's traditional supplier management systems are proving difficult to apply in the pursuit of sustainability. Traditional models are ill-prepared to account for the copious uncertainties of the rapidly changing environment with its new labels and new actors performing in the market (Foerstl *et al.,* 2010). These challenges are made more difficult by the nature of confidentiality, which limits the buyer access to suppliers' information (Wycherley, 1999). In order to survive these new uncertainties, numerous studies highlight the need to work closer with suppliers (Vachon & Klassen, 2008), relying more on development activities (Carter & Carter, 1998), cooperation and partnerships (Hartman, Hofmann & Stafford, 1999), and joining forces with suppliers and other external partners in a long-term perspective (Walker & Phillips, 2009).

Research has shown the need for purchasing to increase its scope of activities to consider other stakeholders (Carter, Carter, Monczka, Slaight & Swan, 2000) and increasing internal cooperation (Schneider & Wallenburg, 2012). The implementation of corporate sustainability relies heavily on the purchasing function (Schneider & Wallenburg, 2012). Corporations on the forefront of this movement are concerned about selecting suppliers based not only on the traditional principles of quality, price and reliability, but also on how well they conform to CSR initiatives and

environmental issues (Tshikila, 2011). Because as Krause *et al.,* (2009) said, a business is no more sustainable than its suppliers are. This places purchasing in a dominant position to achieving sustainability.

2.3.2.2 The theories of sustainable sourcing

Roome (2001:70) appropriately states that "we increasingly see ourselves as part of a network society living in a network age", "concerns about complex environmental and social consequences of industrial activity have provoked the need for more frequent and meaningful engagement between companies and stakeholders", "networks have an identified role in innovation for environmental management and sustainable development" and "knowledge suggests that ecosystems are based on organisms connected through complex networks of energy and material flows".

The SC of products that are sourced in less developed countries can be subject to poor management practices and weak regulations. Dispersed suppliers like small-scale farmers tend to fall below the size threshold for environmental regulations. Retailers and large product manufacturing corporations are exceptionally well positioned to influence the environmental performance of those small-scale suppliers. Big corporations have the potential to use their influence over suppliers, their market position and their consumer base to drive environmental improvement.

Accomplishing these potential changes is an exceptionally challenging task due to the complex product value chains and large numbers of geographically distant suppliers (Styles *et al.,* 2012b). Sustainable sourcing revolves around the selection of suppliers who firstly, meet high environmental standards; secondly, provide good economic value at competitive prices; and thirdly enforce the corporation's social values and standards (Schneider & Wallenburg, 2012). It however remains unclear as to whether neglecting one of the dimensions in sourcing can be corrected by placing huge focus on one of the remaining two dimensions (Schneider & Wallenburg, 2012).

Purchasing strategies have evolved over the years away from a dominant focus of the current price to a more holistic approach which looks at the total cost of ownership. This evolved approach looks into and accounts for the effects of resource depletion and the creation of by-products (Linton *et al.,* 2007). Purchasing has moved away

from the buying of standardised inputs and raw materials to a methodology based on joint-value creation (Carter & Carter, 1998) Purchasing has shifted from predominantly quantifiable financial performance measures to putting more weight into qualitative measures like working conditions and social welfare (Carter & Rogers, 2008).

Suppliers have a critical role to play in a collaborative SC. The management of these partnerships with suppliers is just as significant for successful implementation (Duffy, Fearne, Hornibrook, Hutchinson & Reid, 2013). Corporations have been putting more pressure on suppliers in order to improve the suppliers' business processes. This can be through the usage of new technologies and cost reduction in product development, thus creating more value for the corporation's customers (Berning, 2014). By doing this, corporations are encouraging suppliers to decrease their environmental impact and become more sustainable during the product design and delivery phases. The ability to encourage suppliers' actions comes from a good working understanding of a corporation's stakeholder. The focus is therefore on managing SC relationships, and more specifically, the relationship between the corporation and its suppliers (Darnall, Henriques & Sadorsky, 2008).

According to Krause and Ellram (1997), successful SC partnerships start with efficient supplier development. These authors define supplier development as "any effort of a buying firm with its supplier to increase the performance and/or capabilities of the supplier and meet the buying firm's supply needs". By working together, corporations and suppliers can ensure a baseline standard for business conduct but also work together to improve the influence business has on society and the environment (UN, 2010). In Table 2.6 below one can see the different aspects for each of the pillars of sustainability, into which corporations need to consider when forming their supplier code of conduct.

Table 2.6: Topics to consider for the Supplier Code of Conduct
Human Rights and Labour
1. Forced labour 2. Machine safeguarding 3. Child labour 4. Industrial hygiene 5. Occupational safety 6. Physically demanding work 7. Non-discrimination 8. Working hours 9. Occupational injury and illness 10. Wages and benefits 11. Fire safety 12. Freedom of association and collective bargaining 13. Humane treatment 14. Emergency preparedness
Environment
15. Material toxicity and chemicals 16. Biodiversity 17. Raw material use 18. Water use and waste water treatment 19. Air pollution 20. Greenhouse gas emissions 21. Recyclability and end of life of products 22. Energy use
Anti-Corruption
23. Conflict of interest 24. Reporting misconduct 25. Bribery and kickbacks 26. Accounting and business records 27. Protecting information 28. Gifts, meals and entertainment
Source: UN, 2010.

The importance of managing suppliers can be seen through the SCM literature, it is done as a part of an organisation's operations (Prajogo, Chowdhury, Yeung & Cheng, 2012). The cooperation and management of suppliers does not just extend to the conventional first-tier suppliers (Seuring & Müller, 2008); sub-tier suppliers need also be included in cooperation and management programmes. Sub-tier suppliers are seen as the companies that supply your suppliers. They are the companies, which you do not source directly from but that have inputs into your products and services. Several corporations and industries have found that sub-tier suppliers are the most challenging to deal with when addressing sustainability issues (UN, 2010). The UN recommend that businesses be aware of where in the SC sustainability challenges are expected to arise by mapping their complete SC. By doing that one can then evaluate the importance of the issue on your firm and its possible influence on society to decide if or how to include it in the span of your sustainable SC programme (UN, 2010).

The ultimate goal of engaging with suppliers is to build supplier ownership of the sustainability vision, strategy and performance, to cultivate a shared mindset about sustainability issues and to work closer with suppliers who have shared priorities (UN, 2010). Diagram 2.5 illustrates the ways in which companies can engage with their suppliers to attain sustainability.

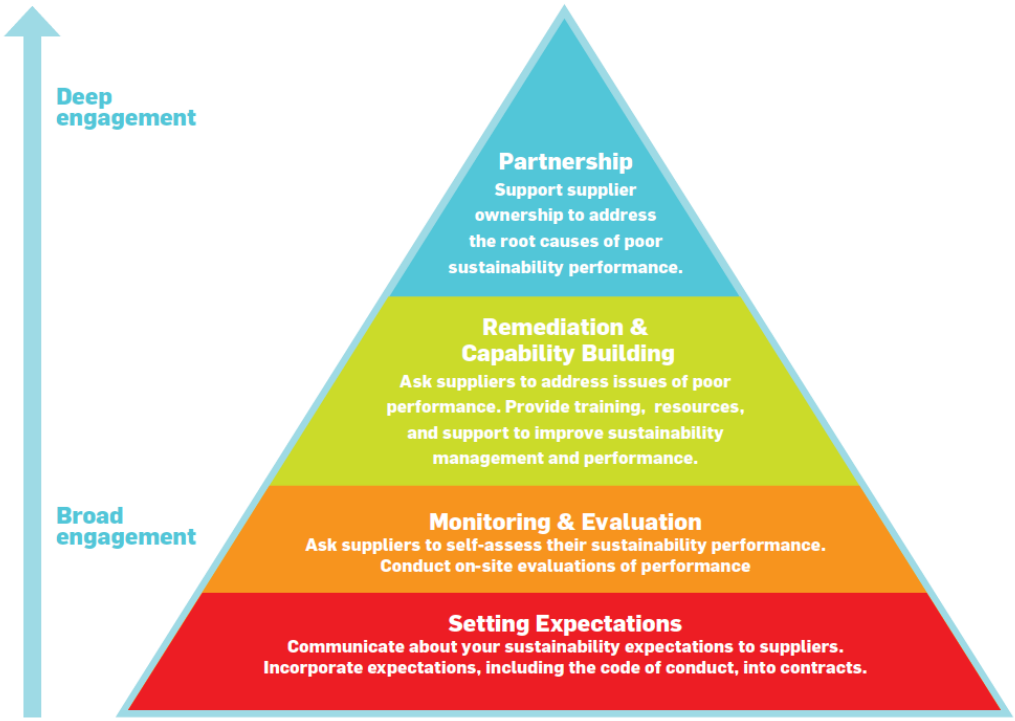

Diagram 2.5 Tools for engaging with suppliers on sustainability

Source: UN, 2010

Supply management professionals have three main levers for moving the agenda and commitment on SC sustainability (UN, 2010): (1) **Selecting of new supplier**s. When selecting new suppliers, companies can include social and environmental management and performance criteria alongside the commercial criteria. (2) **Engaging with existing suppliers.** Existing suppliers will also need to comply with a company's sustainability expectations. Depending on the current state of sustainability management systems at any given supplier, it may require investments in people and systems that will take time to translate into improved performance. Supply management professionals should take a continuous improvement approach to sustainability with existing suppliers based on mutual transparency, realistic timelines, continuous improvement and partnerships. (3) **Integrating sustainability considerations in sourcing decisions.** Companies can take many steps to support supply management professionals in integrating sustainability and overcoming the perceived tension between sustainability and business drivers.

2.3.2.3 Drivers and barriers of sustainable sourcing

If one looks at what motivates companies to implement sustainable sourcing one can note drivers like increased brand image, technical advances, and increased scrutiny by the global community. When looking at what slows and discourages investments into sustainable sourcing one can see areas like conflict with collaboration with suppliers, the high cost of implementation and the lack of capabilities to implement as factors that hinder commitments. After looking into what drives companies to seek and implement sustainable sourcing practices and particular barriers the companies face, Table 2.7 was compiled to give a concise overview of what drivers and barriers one can expect.

Table 2.7 Drivers and Barriers for Sustainable Sourcing

Drivers	Barriers
Reduced costs due to reusing of old components, reduces packaging, and lower labour costs (Berning, 2014; Styles *et al.,* 2012a)	Unawareness of corporate sustainability and its implementation (Schneider & Wallenburg, 2012)
Favourable brand image (Berning, 2014)	Conflict within collaborations (Berning, 2014)
Environmentally-friendly product requirements (Berning, 2014)	Complexity of uncertainties involved in sustainable supplier management (Crespin-Mazet & Dontenwill, 2012)
Reduction of by products (Berning, 2014)	High cost of implementation (Berning, 2014)
Increased brand reputation due to association with sustainable suppliers (Berning, 2014)	Lack of capabilities to implement sustainability practices (Schneider & Wallenburg, 2012)
Collaborations between suppliers and producers (Berning, 2014; Timlon, 2011)	Lack of needed assertiveness within purchasing division (Schneider & Wallenburg, 2012)
Technological improvements (Berning, 2014)	Lack of organisational focus on sourcing (Schneider & Wallenburg, 2012)
The potential for value creation (Farrell,	

2005).	
Increased scrutiny due to global connectedness (Timlon, 2011).	
Corporate social responsibility (CSR) (Styles *et al.,* 2012a).	
Consumer demand (Styles *et al.,* 2012a).	
Legal requirements both current and anticipated (Styles *et al.,* 2012a).	
To avoid risks associated with unsustainable practices of a firms suppliers (Styles *et al.,* 2012a).	
Risks associated with green washing practices (Crespin-Mazet & Dontenwill, 2012).	
Personal commitment of managers and investors (Crespin-Mazet & Dontenwill, 2012).	

2.3.3 Sustainable reverse flow theories

The scarcity of resources, pollution problems created by industrialised countries plus the social, environmental and economic uncertainty of the recent time has led many researchers to tackle the issue of SD from many points of view (Turrisi, Bruccoleri & Cannella, 2013). This shift in environmental concerns in the past few decades has led to an interest in SSCM and a significant rise in product recovery activities (Ilgin & Gupta, 2010).

The increased attention given to product recovery is stimulating change in how firms handle the backwards movement of products within their SC. Reverse logistics (RL) is increasing in importance, this is partly due to the force of governmental regulations on companies to take back their products (Sarkis *et al.*, 2010). The reason behind the regulations is mainly due to the fact that today's consumers are increasingly concerned over the environmental impacts of products and services they buy (Alfonso-Lizarazo *et al.*, 2013). Organisations are having to become more concerned

with green operations (Alfonso-Lizarazo *et al.*, 2013). Although RL has existed for as long as forward logistics has, the growing social concern for the environment has caused RL activities to become a vital function of business (González-Torre, Álvarez, Sarkis & Adenso-Diaz, 2010).

RL is all about the retrieving of products at the end of their life cycle and shifting them through the production and delivery SC for re-use and recycling. RL is an area of growing importance to manufacturers (Sarkis *et al.*, 2010). "Companies and their supply chain managers can no longer afford to treat reverse logistics as an afterthought. There is just too much at stake in terms of brand protection, sustainability requirements, and ultimately profitability. In short, RL needs to become a core competency. The practical insights offered here will help you develop that competency" (Rodgers, Lembke & Benardino, 2013:40).

2.3.3.1 The principles of sustainable reverse flow theories

Traditional logistics are concerned with the management of the supply of goods from the producer to the final consumer. While RL entails the return of products from the final customer to the focal company (Ashby *et al.,* 2012), RL has been defined as "the process of planning, implementing, and controlling the efficient, cost-effective flow of raw materials, in-process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing value or of proper disposal" (Rogers & Tibben-Lembke, 1999:2). Genchev (2009) further defines RL as the process of moving goods from their traditional final destination back to the firm for the purpose of recapturing value and correct disposal (Genchev, 2009). See diagram 2.6 for a visual representation.

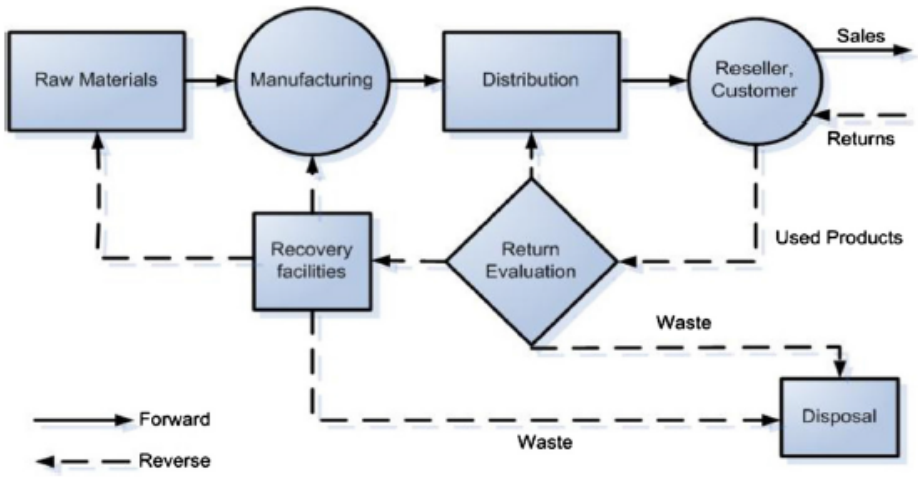

Diagram 2.6 Supply Chain with Reverse Logistics

Source: Govindan, Soleimani & Kannan, 2015

RL is necessary for product stewardship and prolonging the life of materials and products. These are two aspects used in reducing the environmental burden from business operations (Gonza´lez-Torre *et al.,* 2010). Progressively, the backwards movement of goods and services in a firm's SC is becoming an essential business activity regardless of the products involved or industry (Genchev, 2009).

RL is said to be a "process whereby companies can become more environmentally efficient through recycling, reusing and reducing the amount of materials used" (Carter & Ellram, 1998:85). RL is meant to provide the maximum utilisation of used products, every output is returned to a natural system or to becomes a new input in the manufacturing of another product (Tsoulfas & Pappis, 2006).

RL covers product recovery activities, which are essential to sustainability. These include repair, renovation, reprocessing, cannibalisation, remanufacturing and recycling (Kroon & Vrijens, 1995; Nikejad & Petrovic, 2014). Recycling generally only refers to the re-use of materials used in a product without preserving the product's structure, which requires the disassembly of the returned product, the separation of parts and then material reprocessing; repair typically involves activities needed to restore damaged products back to working order while maintaining the product's integrity. Meanwhile, remanufacturing includes disassembly, replacement of parts where needed to bring the product back to working or better than new

condition (Nikejad, Petrovic, 2014; Fai Pun, 2006). All of the parts, products, materials and subassemblies embody increasing value and economic opportunities at the end of the SC (Ashby *et al.,* 2012). RL extends to include all the logistical steps involved in the collection, disassembly and processing of used parts, packages, materials and products to create an environmentally safe method of recovery.

The success of RL requires that the entire SC be encompassed. Partnerships need to be developed and managed to ensure that the RL process is linked across all levels of the SC (Mills, 2007).

RL actively "aims to reduce materials/resources in the forward system so that fewer materials flow back" (Ashby *et al.,* 2012: 503). The reasons behind the promotion of RL activities are both environmental as well as economic. Included in the economic motivations is the value that can still be found in used products and the savings that arise in components and materials. From the environmental standpoint, the concerns around solid waste pollution landfill saturation or the scarcity of raw materials are noted (Kroon & Vrijens, 1995; González-Torre, Adenso-Dıaz, & Artiba, 2004). The reduction of resources through re-use, recycling and waste elimination is the goal of RL (Carter & Ellram, 1998). It is said that RL activities can lead to cost savings and the enhancement of competitiveness (Rao & Holt, 2005).

In order to develop RL strategies, new trends have arisen such as total quality environmental management, environmentally oriented design, green supply chain management, life cycle analysis, and ISO 14000 standards. These strategies are becoming much more widespread (Sarkis, 1998).

2.3.3.2 The theories of sustainable reverse flow theories

Initially, the growing attention on RL and closed-loop SC issues came about through public awareness. Subsequently, governmental legislation began to force producers to deal with their end-of-life products. For example, the waste electrical and electronic equipment directive became a part of European law in 2003. This directive has made the collection, recycling and recovery of all kinds of electrical goods a part of its mandatory requirements. It is important to note that there is a clause which states that the minimum rate of 4 kilograms per head of population per year applies. Similar

legislations have been introduced in countries like Canada, China, Japan and various states in the United States. RL is now viewed as a revenue opportunity for producers instead of just a cost-reduction approach (Govindan *et al.*, 2015)

"EU legislation has highlighted the importance of products recovery and recycling. Between 1990 and 1995, the amount of waste generated in Europe increased by 10 percent, and by 2020, the Organisation for Economic Cooperation and Development estimates we could be generating 45 percent more waste than in 1995. The 67 percent of end-of-life products is either burnt in incinerators or dumped into landfill sites. Both these methods create environmental damage, taking up more and more valuable land space, but it also causes air, water and soil pollution" (Turrisi *et al.,* 2012:566).

The move by the EU is a good indication as to how RL can be divided up. Many people think that RL activities only include the removal and sorting of end-of-life products. But this is not correct; a very big part of RL is the product design stage. If a product is not designed with sustainability in mind, it will have a huge impact on a firm's ability to achieve its SC sustainability goals. Diagram 2.7 below is a graphical representation of the hierarchy of waste management.

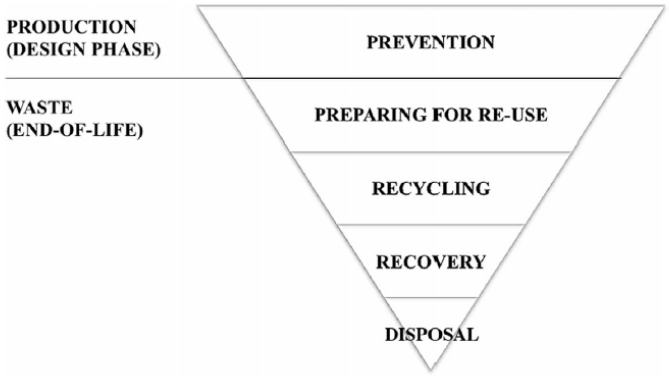

Diagram 2.7: The waste management proposal hierarchy
Source: Turrisi *et al.,* 2012

Thierry, Salmon, Van Nunen and Van Wassenhove (1995) wrote a paper on product recovery management. They presented five product recovery options, namely: (1) repair, (2) refurbishing, (3) remanufacturing, (4) cannibalisation, and (5) recycling.

Four of these five are mentioned extensively in more modern research papers on RL management. Diagram 2.8 below gives an indication as to where in the SC each option can be utilised

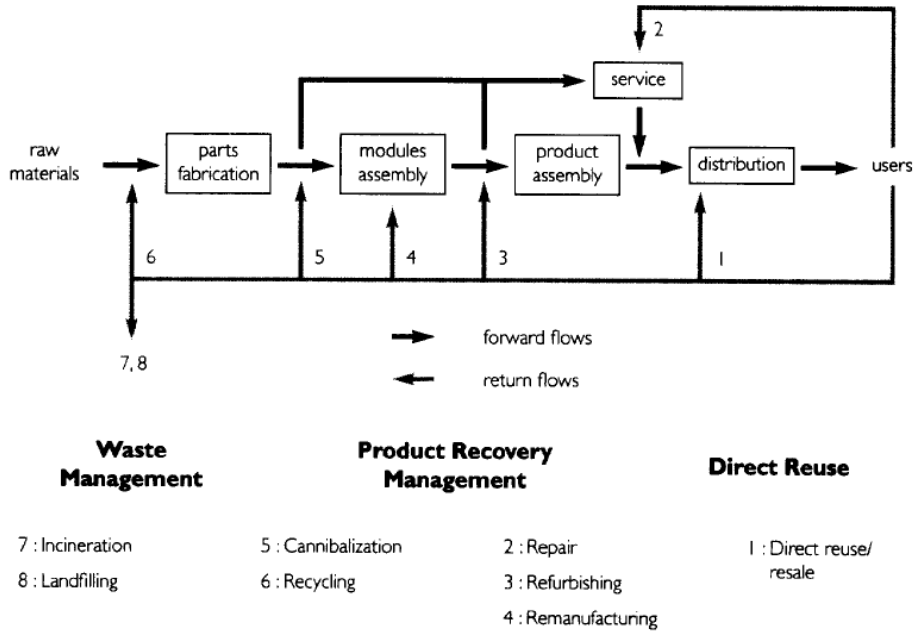

Diagram 2.8 The Integrated Supply Chain

Source: Thierry *et al.*, 1995

Ron Giuntini (1996) stated that there are seven R's of RL management: recognition, review, recovery, renewal, re-entry, removal and re-engineering.

(1) **Recognition**. This is where suppliers "create managerial accounting balance sheet transactions and perpetual inventory records transactions to identify [products] currently at customers. These [products] will provide future liabilities and operating costs to the supplier" (Giuntini, 1996:84).

(2) **Recovery**. This involves the creation of a "call-out" management system by the suppliers whereby they have the customer return the empty/used products. The supplier must also have a physical transportation and handling management system in place to deal with the returns.

(3) **Review**. This is where a management process needs to be created and a decision is made whether to renew or remove the product from the organisation.

(4) **Renewal**. This is where a firm must create and execute an internal or external operational process for the re-entry of the product into the SC. The firm also needs to create a management accounting system to track these costs. Below are the six R's of renewal; they are divided between product life span extension whereby the products structure remains the same and material life cycle extension whereby the product structure is altered: (a) product life-span extension, which includes remanufacturing, repairing and re-use; (b) material life-cycle extension, which includes recycling, reclamation and reconfiguration.

(5) **Re-entry.** This is where the firm needs to read the renewed products into the firm's production system and ultimately the SC.

(6) **Removal.** This is where, if the organisation is unable or unwilling to renew the product, it must then be removed from the organisation. Removal options are twofold. The product may be resold, which includes the reselling of the material to another organisation that will attempt to renew the material. The other option is to retire the material through the solid or hazardous waste disposal stream.

(7) **Re-engineering.** This is where, as a result of the above processes, a firm can incorporate alterations into current product design processes and operational management systems that will decrease the volume of damaged material resources.

Diagram 2.9 below provides a visual representation of the seven R's of RL that have been discussed above.

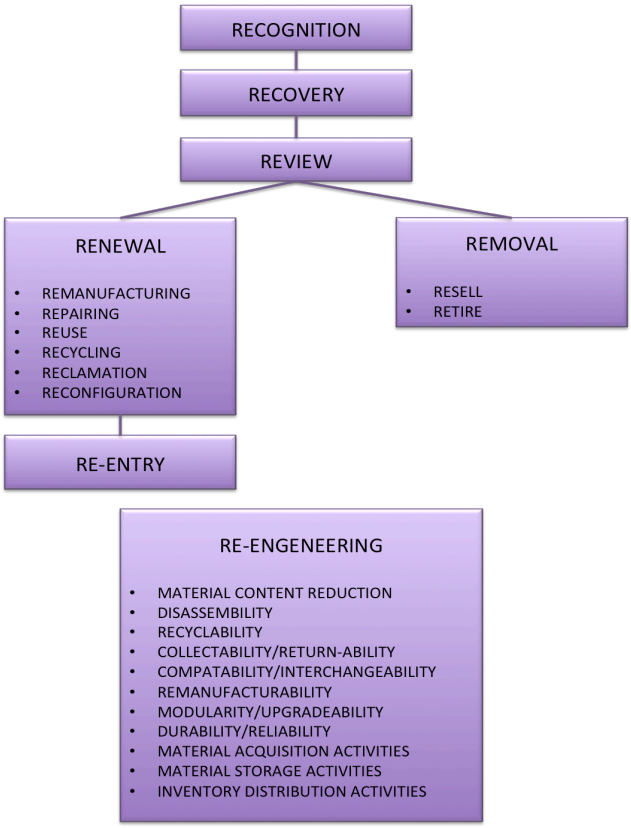

Diagram 2.9 The Seven R's of Reverse Logistics
Source: Adapted from Giuntini, 1996

Many other authors have expanded on the topics and ideas mentioned by Giuntini. Particular focus has been given to remanufacturing, re-use, reconditioning, recycling and product design. This will be briefly discussed below.

Remanufacturing

Remanufacturing is defined as "an industrial process whereby used products referred to as cores are restored to useful life. RL is a systematic process of planning, implementing and controlling the backward flow of raw materials, in-process inventory, packaging and finished goods, from a manufacturing, distribution or use point, to a point of recovery or proper disposal there is high business value in remanufacturing" (Subramoniam, Huisingh & Chinnam, 2009:1163).

Lee and Lam (2012) mentioned that remanufacturing can decrease waste, save energy and reduce space needed for landfill. In certain cases, it is more cost effective to

remanufacture a product rather than producing it from raw material. Guide, Jayaraman, Srivastava, and Benton (2000) discussed the challenging characteristics of remanufacturing, mentioning the uncertainty in the timing and volume of returned products. The main recommendation to rectify these challenges is to adopt planning and control techniques.

Remanufacturing is included in RL as it forms part of the disposition decisions, like moving products to a landfill or to a secondary market. Both products and packaging have been studied extensively in the literature as they both form a part of RL (Rogers, Melamed & Lembke, 2012). Remanufacturing of end-of-life products must have an economically and environmentally viable RL channel for supplying reusable used components to the production system (El Korchi & Millet, 2011). Setting up a remanufacturing system entails the redesigning of products to integrate design for remanufacturing standards. It also requires the restructuring of the SC to integrate a new logistics channel for the collection, remanufacturing, and remarketing of products (El Korchi & Millet, 2011). In remanufacturing research, product design has been widely looked into by researchers. Recently, the research done has begun to be adopted by product designers (El Korchi & Millet, 2011).

The main aim of remanufacturing is to get used products back up to the needed quality standards which are on the same level as new products (Thierry *et al.,* 1995). This is done by the complete disassembly of the unit whereby all parts and modules are inspected and worn-out parts are replaced with new parts. The repairable parts are fixed and tested and then used in the repair of other units (Thierry *et al.,* 1995).

The current shortages of rare and precious metals have led to the need for them to be re-used. Subramoniam, Huisingh and Chinnam (2009) defined re-use as an instance where a product is used again; this results not only in economic but ecological benefits too.

Reconditioning

Lee and Lam (2012) discussed the reconditioning and selling of a used item into a second market. They mentioned how this can bring possible profits to a company. However, it is important that these reconditioned items do not cannibalise new

product lines on the market. Refurbishing is done so as to bring used products up to a specified quality (Thierry *et al.,* 1995).

Recycling

Recycling is another approach for SD. The main theme around recycling is product recovery management (Lee & Lam, 2012). Gupta (1995) stated that waste products and emissions may be recycled and returned into a raw material state which can be used in the same or a new production process. The main aim of recycling is the re-use of the materials used to manufacture the product and its components. Recycling begins with the disassembly of the used products into their different material components; these respective components can subsequently be re-used in the making of new components (Thierry *et al.,* 1995). The importance of effective customer participation in recycling business must be noted (Lee & Lam, 2012).

Product Design

Product design is a large part of RL within the SC. It is strange how processes that are planned long before a product is produced can play a vital role in its disposal and environmental impact during the reverse flow of products through the SC.

"The marketplace is also implicitly saying that the supplier must redesign its products to eliminate and minimise waste, or if the supplier fails to accomplish this goal, the supplier will be forced to absorb the costs associated with managing impaired material resources. The ramifications of this change are truly of historical proportions" (Giuntini, 1996:81). Sustainability has become an essential aspect for competitive companies; they need to consider environmental, social and economic performances as a part of product design (Fargnoli, De Minicis & Tronci, 2014).

The role of design management is to provide tools and methods for supporting technicians and managers throughout the process of design. Here, it becomes fundamental to take sustainability issues into account in the design and development process of a new product creation. Acting at the design stage is proven to be important for SD, due to the fact that it makes it simpler for producers to comply with safety requirements, decrease environmental impact, and simultaneously meet economic constraints and customers' satisfaction (Fargnoli, De Minicis & Tronci,

2014). Product design is needed in order to produce a sustainable product. "Sustainable products is the term used to comprehend all kinds of products that have or aim at an improved environmental and social quality, which can be related back to the already mentioned implementation of environmental and social standards. The ultimate aim is to satisfy customers and gain a competitive advantage in the market" (Seuring & Müller, 2008:1705).

As the role of business grows in the sustainability movement, it is being noted that businesses need to pay attention to product design. This is due to the indisputable fact that product design plays a key part in helping to obtain sustainability (Arnette, Brewe & Choal, 2014). Eco-design is seen to be the most suitable design structure for allowing engineers to partake in environmentally conscious development and design of products (Boks, 2006). Eco-design has been defined as an activity aimed at the "integration of environmental aspects into product design and development, with the aim of reducing adverse environmental impacts throughout a product's life cycle" (ISO, 2011). Eco-design principles need to be implemented in the beginning stages of a product's life, therefore the industrial designers play a vital role in ensuring that products are in line with the sustainability directives (Mills, 2007).

"Eco-design integrates environmental aspects into products to minimise risks of emissions disseminated during production, consumption and disposal phases of products' lifecycle" (Khor & Udin, 2013:72). Eco-design is very similar to and often interchangeable with green product design. Green product design is defined as a "corporate proactive approach for integrating product design and environmental considerations without compromising product's function and quality, including innovations for recovering product value throughout its life cycle prior to disposal" (Khor & Udin, 2013:72). There are seven prominent eco-design theories which are discussed below.

Design for sustainability

Design for sustainability is the widest spread and most effective approach for eco-design; this is due to the fact that it is aimed at supporting businesses with both the fulfilling of customers' needs and the ever growing environmental and social pressure (Fargnoli *et al.,* 2014). The design for sustainability concept comprises not only of

social issues but also of environmental aspects. This means that the impact of products on society with things such as the costs of accidents and illnesses are viewed as being very relevant and thus translates into a need for more detailed attention to be given into the impacts of products on their users when developing products (Fargnoli *et al.,* 2014). Design for sustainability is seen as being a holistic people-centred approach (Fargnoli *et al.,* 2014).

Design for environment (DfE)

Fiksel and Wapman (1994) defined DfE as the "systematic consideration during new product and process development of design issues associated with environmental safety and health over the full product life-cycle". The reason behind the engagement in DfE differs from firm to firm. Some use DfE to reduce cost, increase market share or meet environmental standards and regulations and competitive advantage (Arnette *et al*., 2014; Handfield *et al.*, 1997). DfE gives attention to material selection, waste reduction, and energy use (Arnette *et al*., 2014). The goals of DfE are to minimise the overall use of non-renewable resources, to have effective management of renewable resources and to decrease the volume of toxic emissions coming from products during their life span. Designs, which decrease the complexities linked to value recovery, must be thoroughly taken into account (Khor & Udin, 2013).

DfE comprises of both the design and development of new products and processes (Tsoulfas and Pappis, 2006). DfE provides an avenue to design and develop recoverable products that are robust, reusable, unhazardously recoverable and compatible with the environment in disposal (Tsoulfas and Pappis, 2006). A number of difficulties were associated with DfE, including the designers' inexperience with the process of DfE and its subsequent lack of integration with traditional design tools. This results from a lack of coordination of the processes of manufacturing (Ashby *et al.*, 2012).

Design for disassembly (DfD)

Disassemblability of products impacts both the time-sensitive recovery of a product (i.e. recondition, repair, remanufacture) and the cost-efficient of product recovery (i.e. recycle) (Khor & Udin, 2013). "Instead of designing products that accommodate use of recycled material, design for disassembly must be taken into consideration for

value recovery purposes, whereas design for environment should be adopted for minimising threat of e-waste to the natural environment. Design for disassembly facilitates accessibility and separability of modules, parts and materials with secondary market value" (Khor & Udin, 2013:76).

The objective of DfD was to design a product that can be disassembled easily to facilitate the salvage of recyclable materials, as well as the safe disposal of non-recyclable material. Remanufacture is another environmentally related driver for disassembly. This is due to the fact that service and maintenance were heavily dependent on disassembly which in turn impacts the economics of a firm. The efficiency of disassembly is based on the number of parts a product has, the types of tasks and tools required for disassembly to take place, and the difficulty of the tasks needed to estimate the disassembly time and develop a rating for the effectiveness of the DfD design (Arnette *et al.*, 2014). To assess the effectiveness of DfD one needs to examine if the process of disassembly is destructive or not, whether the whole product can be disassembled or if it is selective, and look into the activities that must still follow after the disassembly, like remanufacture, recycling, refurbishment and repair to assess the effectiveness of the DfD design (Arnette *et al.*, 2014). Sadly, it is stated that DfD is an understudied eco-design strategy (Cerdan, Gazulla, Raugei, Martinez & Fullana-i-Palmer, 2009).

Design for recyclability (DfR)

One of the drivers toward DfD was the fact that there was a desire to increase the number of recyclable parts in a product. DfR takes a more pre-emptive approach to growing the recyclability of a product. Rather than merely recycling components after disassembly, DfR looks at the selection of materials during the design stage and assesses if they can be recycled or not; if not, a recyclable material which can be used to replace the non-recyclable material is sought. By increasing the number of materials which can be recycled in a product's design, will in turn increase, the recycling yield after disassembly increases (Arnette *et al.*, 2014).

DfR does not seem to have significant influence on RL product disposition options. It does, however, help in adjusting a firm's preference towards the types of raw materials used. Product designers are recommended to group compatible materials

together for the ease identification of valuable, recyclable and recycled materials. Sadly, the absence of a relationship between DfR and product disposition options have resulted due to the manufacturer's disinterest towards product take-back, except for distribution-related and manufacturing-related returns (Khor & Udin, 2013).

DfR and DfD are complementary approaches which allow for more efficient and profitable re-use or disposal of product modules. They can extend to the design for easier re-use and remanufacturing of a complete product (Ashby *et al.,* 2012). Unfortunately, however, DfR is highlighted as an understudied eco-design strategy (Cerdan *et al*., 2009).

Design for remanufacture (DfRem)

Remanufacturing is the capability of taking a product that has reached the end of useful life and salvaging it by "disassembling, cleaning, refurbishing, replacing parts (as necessary) and reassembling a product in such a manner that the part is at least as good as, or better than, new" (Bras & Hammond, 1996:2). One of the drivers for DfRem is the potential financial benefits from remanufacture. Remanufacturing is more desirable to recycling from an environmental perspective because it returns a product to a working condition instead of just reducing it back into its raw materials. It is very important to note that remanufacturing is only suitable when there is a market for remanufactured products and that remanufacturing can be restricted as a result of obsolescence, patents and shifts within industry (Arnette *et al.*, 2014).

Design for serviceability (DfSv)

DfSv revolves around the concept of designing products that can be easily serviced if a failure occurs. This is an important aspect of product design. DfSv focuses on techniques to improve the serviceability during the product design phase. This is done for the benefit of the company and consumers. There are two issues that impact product serviceability. These are: (1) maintainability, which is the ease of maintaining a product at an affordable cost during its useful life; and (2) reliability, which is the likelihood of the product operating as planned without failure for a given period of time (Arnette *et al.*, 2014).

Design for life-cycle (DfLC)

The stages in the product life-cycle are often debated, but seven stages have been identified. These are: need, design, production, distribution, usage, disposal, and recycling. DfLC gets designers to focus not only on the impact design has on manufacturing and assembly, but also on the other stages of a product's life. This includes the product use and what happens to the product at the end of its useful life. Most life-cycle research is focused on the post-usage stage whereby the product is recycled or disposed of (Arnette *et al.*, 2014).

2.3.3.3 Drivers and barriers of sustainable reverse flow theories

In general companies are motivated to implement sustainable RL by drivers such as pollution prevention, increased competitive advantage, improved customer satisfaction and increase in bottom line through the recapturing of value from product returns. When considering what slows and discourages investments into sustainable RL one can note the lack of supportive government policies, incomplete information, difficulties in finding funds to implement, and the unpredictability of RL are all factors. After observing into what drives companies to seek and implement sustainable RL practices within a company and what barriers the companies face, Table 2.8 was compiled to give a concise overview of what drivers and barriers one can expect.

Table 2.8 Drivers and Barriers for Reverse Logistics

Driver for Reverse logistics	Barriers to Reverse logistics
Greater growth in operating income (Mills, 2007).	Complexity of interrelated issues involved in global ecology (Lee & Lam, 2012).
Reduction of supply chain risk through increased inventory protection by means of effective recapture of returned goods (Burnson, 2013).	No guarantee of how much of the returned product may be salvaged, re-used or recycled (Rodgers, Lembke & Benardino, 2013).
Pollution prevention becomes a part of business function (Khor & Udin, 2013; Turrisi *et al.,* 2013).	Lack of expertise and commitment (Lee & Lam, 2012; Pumpinyo & Nitivattananon, 2014; Turrisi *et al*., 2012; González-Torre *et al.,* 2010).

Higher return on investment (Mills, 2007).	Incomplete information (Lee & Lam, 2012; González-Torre *et al.,* 2010).
Increased competitive advantage (Alfonso-Lizarazo *et al.*, 2013; Turrisi *et al.,* 2013; Nikolauou, Evangelinos & Allan, 2013; González-Torre *et al.,* 2010)	Unpredictability of the reverse flow, where the potential for low volumes of a multitude of product items (Rogers *et al.,* 2013; González-Torre *et al.,* 2010).
Improve bottom line by the recapturing of value found in returned products (Lee & Lam, 2012: Alfonso- Lizarazo *et al.*, 2013; Turrisi *et al.,* 2013).	The integration of forward and reverse SCs (Alfonso-Lizarazo *et al.*, 2013; Turrisi *et al.*, 2012; González-Torre *et al.*, 2010)
Reduction in costs (Alfonso- Lizarazo *et al.*, 2013; Nikolauou, Evangelinos & Allan, 2013)	The possibility of handling products of an individual basis can increase costs and be difficult (Rodgers *et al.,* 2013).
Improved customer satisfaction through greater value creation (Alfonso-Lizarazo, *et al.*, 2013; Turrisi *et al.,* 2013; González-Torre *et al.,* 2010)	In some industries there is a high level of competition for recycled or resale of products (Pumpinyo & Nitivattananon, 2014).
Improve global performance (Turrisi *et al.,* 2013).	Lack of awareness pertaining to RL (González-Torre *et al.*, 2010).
Reduction on new extraction of raw materials (Turrisi *et al.,* 2013)	Lack of modern technology for extraction and management of reverse flow (Pumpinyo & Nitivattananon, 2014; Turrisi *et al*., 2012; González-Torre *et al*., 2010).
Mandatory regulations (Nikolauou *et al.*, 2013).	Lack of supportive government policies (Pumpinyo & Nitivattananon, 2014; González-Torre *et al*., 2010).
Social pressures toward environmental degradation (González-Torre *et al.,* 2010)	Lack of industry infrastructure conducive to reverse product flows (González-Torre *et al*., 2010).
	Difficulty in contracting funding (Pumpinyo & Nitivattananon, 2014; González-Torre *et al*., 2010).

2.4. Conclusion

There are so many theories written by a multitude of academics and institutions on how and why businesses need to change their behaviours. Some of the theories are user friendly; others are much more complex and need a lot more effort and financial commitment to successfully implement. Businesses have all these theories and suggestions at their disposal when formulating their sustainability policies. This helps ensure they have the best information on which to base their decisions.

Chapter two covers many aspects of the literature that are important for setting up the context and information required for finding linkages between the theories and current practices. What sustainable supply chain management, sustainable sourcing and reverse logistics are about has been discussed in great detail. The principles of supply chain sustainability are described along with the importance of sustainability needs to be integrated within the structure of the business. Mention is made of how small-scale producers can get away with not following regulations as they are small enough to fit below the threshold of the mandatory regulation requirements.

With regards to suppliers, Chapter two examined the importance of a relationship between suppliers and companies to ensure that the companies can achieve their goals, as well as how a firm's purchasing strategy needs to be inclusive of all three spheres of the triple bottom line. Assessing sustainable reverse logistics, it can be noted that there are four prominent methods used, namely: remanufacturing, repair, recycling and refurbishment. But what is even more important for sustainable reverse logistic is the product design phase. If a product is not designed with sustainability in mind it is likely that it will have a much higher impact on the planet and on people than if sustainability is taken into account during its design.

CHAPTER THREE
CASE STUDIES

3.1 Introduction

Companies, locally and internationally have made various changes and commitments to both sustainable sourcing and sustainable RL. Many have supplier codes, purchasing guidelines and partnerships with NGOs to help better their performance across the three pillars of sustainability.

There are currently areas of concern, e.g. palm oil, that are generating media coverage and public outrage. This shows that companies need to focus their attention and new policies to prevent disaster. Palm oil is a highly versatile raw material with the best land-use efficiency of all vegetable oils. It is the livelihoods of millions of famers and communities in Indonesia and Malaysia with a growing impact in Africa and Latin America (Unilever, 2016a).

Even though palm oil has numerous positive qualities, there is, unfortunately a dark side to this oil because of links between the way in which it is grown and deforestation. Deforestation is a key contributor to climate change, accounting for approximately 15% of global emissions. Forest systems also support an astounding 80% of terrestrial biodiversity. More than half of the world's deforestation is linked to the conversion of natural land to produce agricultural raw materials such as palm oil (Unilever, 2016a). The palm oil SC lacks overall transparency and is highly complex, with a large reliance on small processors and traders (Unilever, 2016b).

In order to better understand how the theories discussed in Chapter 2 can fit into real-life business, Chapter 3 will provide six case studies examining the changes and commitment made by six companies to improve SSCM. Chapter 3 evaluates each of the six businesses' commitments and successes in all areas pertaining to sustainable sourcing and reverse logistics.

3.2 International Case Studies

To get an understanding of how sustainability theories are actually implemented we need to look into what large international companies are doing to try and adhere to new movements towards sustainability. Below one will find the different strategies and programmes that companies are utilising in order to achieve some level of sustainability.

3.2.1 McDonald's

McDonald's publishes its Good Business Report annually. All details discussed below come from McDonald's 2014 report, which focuses on its achievements and efforts made from the 1st of January 2014 until the 31st of December 2014. The data retrieved and used in the report is from its nine top markets only, namely: Australia, Brazil, Canada, China, France, Germany, Japan, the United Kingdom and the United States. Its focus is well rounded as it is looking into addressing balanced food offering, sustainable sourcing of food products and packaging, development of energy efficient restaurants, making commitments to the people it impacts and on giving back to the community (McDonald's, 2015).

In order for McDonald's to plan and achieve its sustainability goals it has realised the importance of its stakeholders and has thus developed strong relationships with experts from academia, the socially responsible investment community and NGOs (McDonald's, 2015). It has formed partnerships with organisations including the World Wildlife Fund (WWF), the Global Forest & Trade Network, the Brazilian Roundtable for Sustainable Livestock, the Roundtable for Sustainable Palm Oil and the Sustainable Agriculture Initiative Platform (McDonald's, 2015).

3.2.1.1 Sustainable sourcing efforts

The majority of the environmental impacts on water, land and air occur in the SC of McDonald's, more specifically the sourcing of ingredients (McDonald's, 2015). This is why McDonald's has begun working with its direct suppliers and gaining support towards responsible business goals in ethics, the environment and economic viability (McDonald's, 2015).

In 2010, McDonald's along with the help of the WWF, developed the company's sustainable sourcing priority areas based on where there was the most potential to create change. McDonald's is continuing to monitor and evaluate its progress and areas for improvement (McDonald's, 2015).

Sustainable Sourcing of Beef

McDonald's has begun its regional and global efforts to support sustainable beef production in partnership with industry stakeholders and central NGOs. It has been working with a wide group of stakeholders to decide on the principles and criteria for sustainable beef (McDonald's, 2015).

In 2014, McDonald's helped to found the Global Roundtable for Sustainable Beef (GRSB). The purpose was to bring together key players from the beef value chain around a common goal: to make sure that all areas of the beef value chain are sustainable. This must include all three pillars of sustainability. The GRSB has a global set of criteria and principles and these principles are currently being deployed in Canada for pilot projects to test the new framework, which will be needed to meet McDonald's goal of purchasing a portion of its beef from verified sustainable sources in 2016 (McDonald's, 2015).

Sustainable Sourcing of Coffee

McDonalds is committed to selling espressos and coffees, which are made from coffee beans that are of high quality and responsibly sourced; and investing in the training of farmers in environmentally friendly, ethically sound and economically viable farming techniques. The level of certified sustainable coffee served at McDonald's globally grew by an approximate 32% in 2014, that is a 7% increase from 2012. Both Brazil and Europe (excluding Morocco) already serve only 100% Rainforest Alliance Certified, UTZ Certified or Fairtrade International certified coffees excluding decaffeinated. In the USA, 22% of all coffee sold is certified. McDonald's is confident that it is on track to meet its 2020 goal of 100% verified sustainable coffee sourcing (McDonald's, 2015).

Sustainable sourcing of palm oil

McDonald's goal for 2020 is to have "100% of all palm oil or palm kernel oil used as

an ingredient by McDonald's suppliers for use in McDonald's products which will be Roundtable for Sustainable Palm Oil (RSPO) certified sustainable or covered by GreenPalm Book and Claim certificates" (McDonald's, 2015:19).

Its 2015 goal is similar in that it stated its wish to obtain "100% of palm oil used for restaurant cooking or by McDonald's suppliers to par-fry chicken and potato products will be RSPO-certified sustainable or covered by GreenPalm Book and Claim certificates" (McDonald's, 2015:19). As of the end of 2014, an estimated 97% of palm oil used for the above purposes by McDonalds were certified or covered.

Sustainable sourcing of fish

In both 2013 and 2014 McDonald's claims to have achieved 100% verified sustainable source of all white fish both by restaurants in the chain's top nine countries. Its 2020 goal is to maintain 100% sustainably sourced white fish (McDonald's, 2015).

However, in May 2016 McDonald's has been embroiled in controversy around its fish-sourcing practices. A leaked New Zealand governmental study has cast serious doubts on how sustainable McDonald's fish really is. The document reveals that the New Zealand government knows about falsified data and illegal practices like huge quantities of Hoki fish dumping (BBC, 2016; New Zealand Herald, 2016). In a working paper series by the Institute for the Oceans and Fisheries at the University of British Columbia, it was highlighted that due to the illegal fishing practices in New Zealand's waters that the true and more accurate amount of fish taken from the water is 2.7 times more than the figures reported to the authorities (Simons, Bremmer, Whittaker, Clarke, Teh, Zylich, Zeller, Pauly, Stringer, Torkington & Haworth, 2016).

It is said that 15% of McDonalds fish is the Hoki fish (BBC, 2016). McDonald's disputes this figure and states that only 8% of its Hoki fish is from New Zealand (BBC, 2016). Over the years the Hoki fish has been certified by the Marine Stewardship Council (MSC) many times. However, there have been documented concerns around the true sustainability of this fish (BBC, 2016). British supermarket franchise Waitrose refused to stock New Zealand Hoki in 2009 due to the highly controversial bottom trawling fishing style used to catch this species (New Zealand

Herald, 2009).

McDonald's is being asked by campaigners to stop sourcing the controversial Hoki fish to ensure the survival of the Maui's and Hector's dolphin species which are regarded widely as being the most endangered of dolphin species globally (BBC, 2016 & New Zealand Herald, 2016). McDonald's told BBC news that it places its faith in the MSC which is responsible for assessing the sustainability of the Hoki fish species and fishing activities. McDonald's went on to state that "we understand the importance of protecting marine wildlife, especially endangered species that share the ocean with the fish we use on our menu" (BBC, 2016).

Sustainable sourcing of poultry

McDonald's is currently working on the development of "a common set of guiding principles and best practices for sustainable poultry" (McDonald's, 2015:15). It plans to finalise the details with the suppliers, industry groups and NGOs in 2016 and begin test projects (McDonald's, 2015). The reason behind forming its own principles and standards is due to the fact that there are no broadly accepted accredited principles for sustainable production of chickens (McDonald's, 2015). "The project includes a 2020 commitment by suppliers to McDonald's Europe to use only enriched housing systems, including natural daylight and perches, and purchasing only sustainable certified soy, a major component of poultry feed in 2014, approximately 20% of the soy used for chicken feed was covered by Roundtable for Responsible Soy certificates" (McDonald's, 2015:19).

Commitment to animal welfare

McDonald's requires all its suppliers of meat to be approved annually by independent animal welfare audits. In 2014 it had a 99.8% compliance rating for beef, pork and poultry based on the animal health and welfare standards recognised in the USA and internationally (McDonald's, 2015).

McDonald's has a 2017 goal of sourcing pork only from producers who share its commitment to not use gestation stalls for housing pregnant sows. "McDonald's USA is already working with producers and suppliers to support their transition to group housing systems and will develop verification systems to assess compliance"

(McDonald's, 2015:21).

Sustainable sourcing of timber-based packaging material

McDonald's 2020 goal is to have 100% of fibre-based packaging from certified or recycled sources. In 2014 its global achievement was 23% of fibre-based consumer packaging from verified sustainable sources. Its suppliers are planning to increase the amount of packaging that can be recycled by consumers (McDonald's, 2015).

McDonald's has been working with its suppliers to ensure that they implement chain of custody certifications. In 2014 McDonald's Brazil achieved 100% certified fibre-based packaging verified by the Forest Stewardship Council (FSC) or Programme for Endorsement of Forest Certification. It also achieved 100% certification in 37 countries in Europe in 2014 with 50% of its fibre-based packaging content being from recycled fibre (McDonald's, 2015). It is important to note though that these figures exclude "operational supplies or pre-filled food packaging (e.g. sauce packets, salad dressings)" (McDonald's, 2015:17).

Sustainable supplier code of conduct

McDonald's has a supplier code of conduct. This code is used to ensure that the goals and aims of McDonald's are upheld because its suppliers agree to help enforce certain standards and principles within their business activities. McDonald's expects its suppliers to support its commitment to enforce the fundamental human rights of all people; to treat their employees with dignity, fairness and respect and to ensure that they have principles in place to protect the safety and health of employees within their facilities (McDonald's, 2015). "The Code is supplemented by detailed supplier guidance, annual self-assessments, training and on-site third-party audits to monitor compliance and promote continuous improvement" (McDonald's, 2015:20).

McDonald's acknowledges that its suppliers are independent businesses and that they are the sole employers of their employees. This being said, the actions of McDonald's partners can have a lasting impact on their reputation and the amount of trust they have earned from stakeholders. Even though its suppliers work in different cultural and legal environments throughout the world, McDonald's expects its suppliers to hold their SC, including third-party labour agencies and subcontractors, to the same

standards laid out in the Code of Conduct (McDonald's, 2012).

In the Code of Conduct McDonald's has laid out specifications regarding each of the following aspects of how suppliers should deal with different areas. These areas are discussed in Table 3.1 below.

Table 3.1 McDonald's Supplier Code of Conduct

Human Rights	Environmental Management	Business Integrity
Dealing with Freedom of Association, Employment Status, Employment Practices, Anti discrimination and fair treatment, Working hours and rest rate, Underage Labour, Wages and benefits and the Work Place Environment.	"Suppliers are responsible for managing, measuring and minimizing the environmental impact of their facilities. Specific focus areas include air emissions, waste reduction, recovery and management, water use and disposal, and greenhouse gas emissions"(McDonalds, 2012:6).	Dealing with Compliance with Law, Anti-bribery, Audit and assessments, Books and records, Confidentiality, Grievance Mechanism and Whistle-blower Protection.

Source: McDonalds, 2012

3.2.1.2. Sustainable reverse logistics efforts

These include all the areas where McDonald's is making a concerted effort to improve the reverse flow of its products.

Waste reduction efforts

McDonald's 2020 goal is to increase the amount of in-restaurant recycling to 50% to minimise waste in its top nine markets globally. McDonald's restaurants are recycling waste materials, including used cooking oil and cardboard, for a wide range of secondary uses (McDonald's, 2015). In 2014, at the time of McDonald's releasing its report, it did not have sufficient global waste data to be able to report progress against this goal (McDonald's, 2015). McDonald's "is in the process of establishing a holistic recycling tracking methodology applicable to all waste streams in all restaurants globally" (McDonald's, 2015:4).

3.2.2. Procter and Gamble

Procter and Gamble (P&G) is a global fast-moving consumer goods (FMCG) company. It produces and supplies feminine hygiene products, laundry detergents, toilet paper, toothpaste and other toiletries, household cleaning products and skin-care products, to name but a few. Its big brands known in South Africa include Head and Shoulders, Always Ultra, Pantene, Ariel, Pampers, Olay, Oral B, Braun, Gillette, Old Spice, Tampax and Vicks (Procter and Gamble, 2016).

3.2.2.1. Sustainable sourcing efforts

P&G's areas of focus have not altered much over the last few years. It has four main focal areas, as mentioned by Martin Riant, the group's president in its 2015 sustainability report (Procter and Gamble, 2015). These are: (1) preservation of resources; (2) renewable energy; (3) worth from waste; and (4) social programmes (Procter and Gamble, 2015). P&G's vice-president Len Sauers discussed how it needs to focus on traceability in the SC, its no-deforestation plans and the certification of palm oil (Procter and Gamble, 2015).

Sauers mentioned the importance of forming partnerships with "external stakeholders to reduce greenhouse gas (GHG) emissions in our supply chain by ensuring our sourcing of renewable commodities does not contribute to deforestation and by developing renewable material replacements for petroleum-derived raw materials" (Procter and Gamble, 2015:5). P&G has formed multiple partnerships with organisations like the WWF, the World Resources Institute, the Forest Stewardship Council (FSC) and the Rainforest Alliance (Procter and Gamble, 2015).

Sustainable sourcing of palm oil

This could be seen as a large area of concern for P&G after the drama that unfolded in March 2014 over its sourcing of palm oil for its Head and Shoulders product. Greenpeace activists climbed the headquarters of P&G to tell the company to clean up its supply chain and source palm oil from sustainable sources, as well as launching a large-scale social media campaign against Head and Shoulders, whereby thousands of consumers from all over the world demanded that the source of palm oil not be as a result of deforestation (Greenpeace, 2014a). After months of consumer pressure, P&G agreed to a deforestation-free palm oil sourcing plan (Berkeley, 2014).

Diagram 3.1. Image part of Sustainable Palm oil campaign.
Source: Greenpeace, 2014b

In April 2014, after the Greenpeace campaign, P&G announced that it would take further steps beyond the RSPO certification to ratify that the palm-derived materials it buys are not enabling deforestation. P&G has goals and plans in place to ensure that its palm oil is better sourced. Its plans are to ensure "that palm is grown and harvested without the further clearing and burning of natural forests" (Procter and Gamble, 2015:5). This goal will be achieved through traceability and certification (Procter and Gamble, 2015). P&G aims to ensure the traceability of palm oil and palm kernel oil (PKO) to its supplier mills by December 31, 2015, and all the way to the plantations by 2020 to ensure zero deforestation in its palm oil SC, with a commitment to working with small farmers.

At the end of P&G's 2014/2015 financial year, 89% of its palm oil and palm kernel oil was tracked to the palm oil mill and palm kernel oil mill level. In this same time period 100% of its palm oil and palm oil derivatives were either RSPO mass-balance certified or covered by Green Palm certificates. P&G believes it is on track to reach its 100% palm oil and palm kernel oil traceability goal by the end of 2015 (Procter and Gamble, 2015).

P&G has developed a small farmers' programme, which is focused on improving the

practices and livelihoods for smallholders in the palm kernel oil SC. It has also started working with the industry and NGOs to set standards and methodologies for the sourcing of palm oil products (Procter and Gamble, 2015).

Sustainable sourcing of paper and tissue products

P&Gs goal for 2020 is to have 100% of its paper packaging contain either recycled or third-party-certified virgin content. In the 2014/2015 financial year P&G managed to achieve 97% either recycled or third-party-certified virgin content of the materials assessed (Procter and Gamble, 2015). With "100% of the virgin wood fibre used in our tissue/towel and absorbent hygiene products be third-party certified to one of the aforementioned standards" (Procter and Gamble, 2015:40).

P&G has placed a focus once again on Forest Stewardship Council (FSC) certification and this has allowed it to achieve the success of having 51% FSC-certified fibres in its tissue/towel products. In addition, it has given preference to pulp from FSC-certified forests whenever it is possible. It also makes use of the FSC Controlled Wood as part of its approach to increase the amount of pulp sourced from FSC-certified sources. For pulp not certified by FSC P&G requires that it has undergone a risk assessment in accordance with the FSC Controlled Wood Standard (Procter and Gamble, 2015).

P&G is committed to the following core principles regarding its sourcing of pulp and timber-based commodities (Procter and Gamble, 2015);

1. Safeguarding the safety of forestry and manufacturing operations for their employees and the environment.
2. Guaranteeing that wood is legally harvested and that all legalities are met. P&G states that it "will not knowingly use illegally sourced materials in our products" (Procter and Gamble, 2015:40).
3. Ensuring that its SC incorporates the principles of sustainable forest management and that there is an assurance of continuous improvement in its own operations; and that these improvements are vetted by independent chain-of-custody and forestry certifications.
4. Confirming that P&G's supplier practices reflect its social values and comply with the universal human rights by working with governments and communities to better the education level, the economic wellbeing and the

social welfare of the local communities .

5. Guaranteeing that its SC does not have any fibre originating from conflict timber, which is timber, which was sold in such a way that it encourages armed violent conflict and increases instability both regionally and nationally.
6. Confirming that trees are not harvested from areas which have high conservation value.

Commitment to animal welfare

P&G believes that by eliminating animal testing it is doing the right thing. It does not test its products or ingredients on animals anywhere in the world. However, sometimes it is required by law for a product to undergo animal testing. It will "continue to develop non-animal alternative tests and work with regulators around the world to ultimately end testing involving animals" (Procter and Gamble, 2015:63).

Sustainable supplier management

P&G is engaging with its suppliers to help it implement and meet its requirements for traceability, no-deforestation and certified. In order to do that P&G renewed its sustainability guidelines for external business partners in 2014. The guidelines lay out P&G's expectations of its supply base regarding human rights and sustainability. Within its SC, P&G actively seeks out new business relationships with partners who share its values and help to promote high standards. With the help of P&Gs risk-based audit programme the supply base compliance is assessed through third-party audits (Procter and Gamble, 2015).

A summary of P&G's renewed guidelines includes the following four areas (Procter and Gamble, 2015): (1) external business partners must conduct business with integrity and in full compliance with the law of the country in which they operate; (2) external business partners must not give, agree to give, offer or receive bribes of any form; (3) P&G expects its external business partners to respect UN internationally recognised human rights; (4) external business partners must obey all the applicable environmental laws, rules and regulations.

3.2.2.2. Sustainable reverse logistics efforts

P&G has focused its RL efforts in two main areas, namely waste reduction and packaging improvements. These two areas will be discussed in detail below.

Waste reduction efforts

"We want people who choose P&G brands to know that our products are created with a commitment to sustainability. From formulation to manufacturing to package design and shipment, our products are made responsibly and without trade-offs in performance or value" (Procter and Gamble, 2015:7).

P&G has set the goal that by 2020 it will have zero consumer and manufacturing waste go to landfills. Currently, it has achieved 68 sites out of the 130 globally, which have zero manufacturing waste to landfill (ZMWTL), which represents nearly half of its global sites. In addition, in four countries, namely Germany, Japan, Poland and Vietnam, 100% of its manufacturing sites have achieved ZMWTL. What makes this achievement even sweeter is that it has "generated more than $1.6 billion in value for the company through savings and revenue creation" (Procter and Gamble, 2015:7).

P&G also tracks ZMWTL at its technical centres, offices and distribution facilities. These non-manufacturing facilities are at an estimated 14% ZMWTL. They are, however, trying to find new and innovative recycling systems to quickly catch up to the manufacturing counterparts (Procter and Gamble, 2015).

P&G has formed partnerships with the Closed Loop Fund, the Trash Free Seas Alliance and the Recycling Partnership to form a number of waste-reduction pilot projects in both developed and developing regions, including participation in the Waste to Worth pilot programme in the Philippines (Procter and Gamble, 2015).

Packaging improvements

P&G's goals around packaging include the following: (1) 100% renewable or recycled materials for all products and packaging by 2020; (2) reduce packaging by 20% per consumer use, compared to 2010 findings; (3) double the use of recycled resin in plastic packaging meaning that by 2020 it will need to use 52,000 metric tons of post-consumer resin; and (4) ensure 90% of product packaging is either recyclable

or programmes are in place to create the ability to recycle it (Procter and Gamble, 2015).

P&G has managed to achieve a reduction in packaging of about 10% per consumer use since 2010. In the 2014/2015 financial year it used 12% more post-consumer resin, which equates to 29,200 tons in its plastic packaging. Lastly, 85% of its packaging was considered recyclable (corrugated boxes, cartons, high-density polyethylene bottles (HDPE), and polyethylene terephthalate bottles) (Procter and Gamble, 2015).

P&G is working closely with external organisations, namely the Association of Plastic Recyclers, the Flexible Film Recycling Group and PAC NEXT, to ensure it understands how to design its packaging for recyclability. It is important to note that consumers play a huge role in recycling, because even if the package is 100% recyclable if the consumer does not put it into the recycling it will go to the landfill instead (Procter and Gamble, 2015).

P&G is in pursuit of the capability to replace petroleum-derived raw materials for packaging like plastics with renewable materials. It has concentrated on finding, assessing and qualifying bio-derived resins for the three major classes of resins, which it uses in its packaging, namely; (1) polyethylene (PE), (2) polyethylene terephthalate (PET) and (3) polypropylene (PP). Bio-derived polyethylene has already been commercialised and P&G has demonstrated its ability to use bio-polyethylene in its packaging of its Pantene Nature Fusion. This material originates from sustainably purchased sugarcane grown in Brazil. The bio-polyethylene also delivers a reduced environmental footprint from an overall point of view (manufacture and distribution) (Procter and Gamble, 2015).

P&G is also being proactive in reducing the amount of packaging needed to deliver the same transportation results. In most parts of Western Europe Pampers has eliminated boxes for its large packs and started using bags only. This adjustment has resulted in 6,000 tons of packaging (80%) saved, the equivalent of 4,000 mid-sized cars. It also used nearly 900 tons of plastic (10%) and about 14,000 fewer pallets. All in all this has resulted in 400 fewer trucks on the road, saving more than 160 tons of

CO_2 emissions (Procter and Gamble, 2015).

3.2.3. Unilever

Unilever is a global fast-moving consumer goods (FMCG) company. Its products include beverages, food, personal care products and cleaning products. Unilever has many brands; those most commonly known in South Africa include Flora, Dove, Domestos, Handy Andy, Know, Omo, Liptons, Shield, Sunsilk, Ponds, Surf, TREsemme, Vaseline, Ola, Radox, Glen, Skip, Robertsons, and Stork, to name a few. Unilever makes some of the world's most known brands, which are used by 2 billion people globally every day (Unilever, 2016c).

Unilever's (2015:5) global approach as discussed in its sustainable living plan addresses the company's aim "to drive profitable growth, reduce costs and fuel innovation". Its plan involves a three-pronged approach. First, it spans across Unilever's entire portfolio of brands in all countries where its products are bought and sold. Second, it has a social and economic prong; this is where their products need to make a difference in the health, well-being and livelihoods of consumers. Third, Unilever works across the entire value chain, from the sourcing of raw materials to the manufacturing in factories and the way consumers consume their products (Unilever, 2015).

Its goals for these three prongs are:

1. Improving health and well-being for more than 1 billion by 2020;
2. Reducing environmental impact of the manufacturing and usage of their products by half by 2020; and
3. Enhancing livelihoods for millions by 2020 (Unilever, 2015).

In its Virtuous Circle of Growth, Unilever describes how it generates profit from a carefully formulated sustainable growth business model. Its model focuses on the following three areas;

1. Sustainability-led growth. This is where brands that are incorporating sustainable living into its core purpose are driving success for the business.
2. Less waste, less risk. This is where the reduction of wasted energy, raw materials and so on, create improved margins through efficiencies and cut

costs.

3. Sustainable innovation and collaboration. This is where looking through a sustainability lens at product development, sourcing and manufacturing, opportunities for innovation opens up (Unilever, 2015).

"The Unilever Sustainable Living Plan sets out to decouple growth from our environmental impact, while increasing our positive social impact" (Unilever, 2015:20). Unilever has placed its focus on the following areas to achieve its plans: climate change and deforestation; sustainable agriculture and smallholder farmers; and water, sanitation and hygiene (Unilever, 2015).

3.2.3.1. Sustainable sourcing efforts

Unilever is proud of its business model whereby all raw materials come from sustainable sources, people's health and wellbeing are a priority, there are workplace rights, opportunities and women get fair treatment. By doing this, the environment is safeguarded for future generations. Unilever is aware of changes in consumers' needs resulting from changes in the environment, which is why it is innovative with new products which can help consumers in adapting to such changes with products like laundry detergents that use less water (Unilever, 2015).

Unilever has set out to make a big difference to the issues that matter most. These are: (1) eliminating deforestation - by eliminating deforestation from commodity supply chains by 2020 to help combat the threat from climate change; (2) sustainable agriculture and smallholder farmers - by making sustainable agriculture the mainstream, and so increase food yields and enhance the livelihoods of smallholder farmers; and (3) water, sanitation and hygiene - by working towards universal access to safe drinking water, sanitation and hygiene the role of women is crucial, both as partners in change and as beneficiaries.

By concentrating on these three areas, it believes that it can address the twin goals of promoting human development and combating climate change (Unilever, 2015). It is increasing engagement with governments, NGOs and others industry players to form partnerships to help achieve the changes it wants to see (Unilever, 2015). Its other areas of suitable sourcing efforts are discussed below.

Sustainable sourcing of palm oil

Unilever's goal is that by 2020, it will have achieved a transformation of the palm oil sector, in which the entire industry will move to 100% sustainable palm oil (Unilever, 2016d).

Unilever is one of the biggest buyers of palm oil, which is used in soap, ice cream, margarine and shampoo products. Unilever is a founding member of the Roundtable on Sustainable Palm Oil (RSPO), which aims to bring change to the palm oil industry, which is driving deforestation in many regions (Unilever, 2016d). The RSPO's intention is to formulate and implement global standards and principles for sustainable palm oil. Unilever is also driving its change by working directly with suppliers (Unilever, 2015:13). Operational engagement with suppliers is essential for the transformation of the palm oil industry to eradicate deforestation and meet sustainable palm oil commitments (Unilever, 2016b).

In December 2013, Unilever stated its memorandum of understanding with "Wilmar, an important supplier and Asia's leading agribusiness group which represents over a third of the global palm oil market. This agreement means that the company's plantations will only provide products that are free from links to deforestation and human rights abuses. Other growers, such as Cargill and Musim Mas, have since committed to 'no deforestation' policies, which now cover over 90% of globally traded palm oil" (Unilever, 2015:13).

In November 2013, Unilever launched its new sustainable palm oil sourcing policy, which replaced the previous supplier code, and exhibits a more severe approach to responsible and sustainable sourcing. The policy encompasses three key principles: (1) halting deforestation; (2) protecting peat land; and (3) driving positive economic and social impacts for people and local communities. This policy builds on the RSPO principles and criteria. All of Unilever's suppliers must adhere to this policy, and all major suppliers must be members of RSPO as well (Unilever, 2016b).

Unilever is focusing on buying the majority of its palm oil from a few suppliers who meet the requirements for certified, traceable and known source of palm oil (Unilever,

2016b). In the sustainable palm oil sourcing policy are stipulations for suppliers to respect the land tenure rights of indigenous peoples and communities regarding their customary lands where plantations are developed. Unilever has developed face-to-face workshops with its suppliers to give guidance on this issue (Unilever, 2016c).

Commitment to curb deforestation

"Our ambition is to eliminate deforestation from the world's commodity supply chains, and so combat the threat from climate change. Together with others in our industry, we have committed to achieving zero net deforestation associated with four commodities – palm oil, soy, paper and board, and beef – no later than 2020. This commitment also extends to our tea businesses and supply chains" (Unilever, 2015:13).

To try to achieve its ambition Unilever is working with the Tropical Forest Alliance (TFA), whose goal is to eliminate deforestation from the SCs of consumer goods companies globally (Unilever, 2015:13).

Commitment to agricultural improvements

"Our ambition is for sustainable agricultural production to become the mainstream, as the best way we can help to end hunger, achieve food security and improve nutrition as one of the global sustainable development goals. The world needs to double agricultural productivity and increase the incomes of smallholder farmers. We are among the largest purchasers of crops such as tea, palm oil and vegetables and have a significant role to play" (Unilever, 2015:14)

Unilever has developed its Enhanced Livelihoods Investment Initiative (ELII), a three-year programme with a minimum $10-million investment. This initiative was designed to create a more proficient way for it to buy from small producers. This will enable smaller farmers to generate more income and create better livelihoods for as many as 300,000 farmers and their communities around the world. This programme is set to run until the end of 2017 and investigate new ways to encourage smallholders to grow sustainable commodities like tea, vegetables, sugar, soy, palm oil, cocoa, dairy and fruit, while simultaneously providing new finance models, training and seed funding. (Unilever, 2015)

In 2014 Unilever reported that 800,000 smallholder farmers gained access to training and support (Unilever, 2015). And 55% of all their agricultural raw materials were sourced sustainably (Unilever, 2015)

Responsible sourcing policy for suppliers

Unilever has a responsible sourcing policy whereby the following fundamental principles are covered (Unilever, 2014):

1. Business needs to be conducted lawfully and with integrity
2. Work needs to be entered into on freely agreed and documented terms of employment
3. Employers need to treat all workers equally and with respect and dignity
4. Work must be conducted on a voluntary basis
5. All workers must be of an appropriate age
6. All workers must be paid fair wages
7. Working hours for all workers must be reasonable
8. All workers are free to exercise their right to unionise or not and thus bargain collectively
9. Workers' health and safety must be protected at work and in the workplace
10. Workers have access to fair procedures and remedies
11. The land rights of communities and the indigenous peoples must be protected and promoted
12. Business must be conducted in a fashion that embraces sustainability and decreases environmental impact.

Each of the above 12 principles has written guidelines on implementing mandatory requirements, advancing to good practice, and achieving and maintaining best practice (Unilever, 2014).

Agricultural code of conduct

Unilever has gone so far as to develop a sustainable agriculture code to help ensure that suppliers work alongside it to achieve its ambitious consumer and sustainability targets. With this code, Unilever has asked its suppliers and the farmers to adopt sustainable practices on their farms. It is expected that all suppliers of agricultural raw

materials must commit to joining the sustainability journey and demonstrate commitment by agreeing to the minimum standards of performance and to continuously improve performance over time. This code is a 39-page document covering areas like: agrochemicals and fuels, soils, water, biodiversity, energy, waste, social and human capital, animal welfare, value chain and local economy, and training. It divides different activities into mandatory requirements, must's and should do's (Unilever, 2010).

3.2.3.2. Sustainable reverse logistics efforts

Unilever has focused its RL efforts on the reduction of waste. This is discussed in detail below.

Waste reduction efforts

Unilever has begun to see the benefits to business which have been created through the reductions in environmental impacts as it has started transforming its manufacturing processes around the world and redesigning its products and packaging. Since 2008, the "cumulative costs avoided through eco-production have exceeded €400 million, with energy efficiency playing a big role" (Unilever, 2015:8).

In 2014 Unilever achieved zero non-hazardous waste to landfill across its factory network globally. That means that more than 240 factories across 67 countries have not sent any non-hazardous waste to dumps in a year. Unilever has eliminated the 140,000 tons of waste it used to send to landfill in 2008. Now the plastic laminates are repurposed "into recycled construction boards in Kenya and school desks in Nigeria, tea bag paper from our St Petersburg factory in Russia is recycled into wallpaper, and waste mayonnaise from our Purfleet factory in the UK is turned into biofuel" (Unilever, 2015:8).

All in all, Unilever has eradicated the weight of 17 Eiffel Towers of non-hazardous waste to landfill since 2008 (Unilever, 2015). There has been a 12% decline in waste related to the disposal of our products by consumers since 2010 (Unilever, 2015).

Unilever's product redesign efforts have been impressive. It has created a revolutionary compressed aerosol can. This development is the next big thing in the

deodorant market. The compressed aerosols spray cans use 25% less aluminum and half the amount of propellant gas (Unilever, 2015). This is an example of how new technology can grow brand value and save resources.

The savings Unilever has made from new product innovation and packaging are soaring. “In 2014 alone over €200 million of costs were saved, equally from efficient use of materials and better logistics” (Unilever, 2015:8). Examples of where the costs were saved include: compressing deodorant sprays, compacting washing powders and using lighter-weight and smaller-size packaging and better transport. In Kenya, the warehousing division simply changed the way pallets are packed and loaded into trucks, which allowed an extra two pallets to be delivered per delivery. This means fewer trucks on the road, which results in lower costs and less greenhouse gas emissions (Unilever, 2015).

Unilever’s concentrated laundry liquids are now being sold in new eco-packs. These innovative pouches can be used as standalone packs or refills for existing detergent bottles. Eco-packs use 70% less plastic and reduce the greenhouse gas impact by 50-85% per consumer use. Unilever’s research illustrates that 86% of buyers see the product as appealing, and 80% think the refill pack is more environmentally friendly. In China alone, the used of eco-packs for Comfort fabric conditioners, Omo laundry detergent and Lux body wash have saved around 940 tons of plastic (the weight of 25 Boeing 737s) and €2.5 million (Unilever, 2015).

3.2.4. Nestlé

Nestlé is a multinational food and beverage company. Globally it produces products like breakfast cereals, pet food, baby food, coffees, teas, frozen foods, confectionery, dairy products, snack food and ice cream. Some of its most famous brands in South Africa include Nesquick, Ricoffy, Cremora, Maggi, Milo, Cheerios, Bar One, Aero, Quality Street, Kit Kat, Nespresso, Nescafé, Nespray, Nido, Country Fresh, King Cone and Cerelac (Nestlé, 2016).

3.2.4.1. Sustainable sourcing efforts

Nestlé along with its NGO partners have mapped out its SC. It conducted supplier audits and farm assessments to verify that the procurement of 12 priority ingredients

complies with their Responsible Sourcing Guideline criteria (Nestlé, 2015). Nestlé has made multiple commitments to help suitability. These are discussed in more detail below.

Commitment to traceability

Nestlé has made a commitment to traceability. It is aiming to ensure that its key ingredients have been grown and manufactured responsibly and that the origin of these products can be traced (Nestlé, 2015).

Its objectives are to have both improved and shown compliance with the Nestlé supplier code, and to have completed 10 000 responsible sourcing guideline audits with 70% of them illustrating full compliance by 2015 (Nestlé, 2015). By 2015 it also wishes to have 40% of its 12 priority categories, namely (1) palm oil, (2) soya, (3) sugar, (4) pulp and paper, (5) coffee, (6) cocoa, (7) dairy, (8) fish and seafood, (9) shea, (10) vanilla, (11) hazelnuts, and (12) meat, poultry and eggs, to be traceable (Nestlé, 2015).

In 2015 Nestlé's goal of conducting "10 000 audits has been exceeded and, already, 61% of the non-compliances identified have been addressed. We also achieved our traceability and responsible sourcing targets, although levels vary across categories; 95% of the vanilla we procure is traceable, but our meat, poultry, eggs and fish supply chains are more complex and progress is slower. We have set ourselves a new traceability objective for 2016" (Nestlé, 2015:23).

Commitment to rural development

Nestlé aims to help in rural development by "directly and indirectly promoting economic activity and improving livelihoods of agricultural workers in the supply chain to promote sustainable agricultural communities" (Nestlé, 2015:9).

Its further support can be seen through its continued commitment to eliminating child labour from vulnerable and problem industries likes cocoa, vanilla and hazelnuts. Nestlé has also "trained 47 962 farmers, built or renovated 42 schools, and ensured that 50% of our cocoa co-operatives in Côte d'Ivoire are covered by a child labour monitoring and remediation system" (Nestlé, 2015:5).

Commitment to animal welfare

Nestlé has committed to a humane approach to animal welfare in its organisation by safeguarding the well-being of animals in both its SC and in product testing, while promoting animal health and wellness (Nestlé, 2015).

Commitment to natural resources

Nestlé has made a commitment to respect the Earth's natural capital, by identifying and safeguarding components of ecosystem services which generate value both directly and indirectly. Nestlé acknowledges that it depends on biodiversity in many ways, but especially for the raw materials, as it sources from forests, farms and oceans. "We are committed to mobilising resources to achieve zero net deforestation by 2020 and to helping farmers improve environmental performance through Responsible Sourcing initiatives" (Nestlé, 2015:35).

Its objectives for 2015 with regards to natural resources are to: (1) undertake improvement programmes at all factories adjacent to important water areas to improve its impacts on the surrounding area; and (2) have 30% of its 12 priority categories of raw materials assessed against its responsible sourcing guideline requirements and ensure that if not compliant, there are ongoing improvement plans to preserve natural capital. Its objectives by 2016 are to obtain 40% of its 12 priority categories raw materials being assessed against their responsible sourcing guideline requirements and ensure that, if not compliant, there are ongoing improvement plans to preserve natural capital (Nestlé, 2015).

Nestlé continues to work with its partners to locate factories where there is either a dependency or a potential impact on important water areas. It continues to recommend operational improvements and intensify stakeholder engagement at these sites. Nestlé is contributing to the establishment of the natural capital protocol, which has the potential to help organisations understand and measure their impacts and dependencies on the natural environment. It is one of 10 companies testing the first draft (Nestlé, 2015).

Commitment to sustainable cocoa

The Nestlé cocoa plan aims to increase its suppliers' profitability, secure high-quality cocoa for its business, and address SC issues such as child labour, gender inequality and poor social conditions. Through this plan, it distributes stronger plants, trains farmers in better agricultural practices, supports women farmers and improves access to education for children.

Its cocoa objectives are well planned with each year being allocated a strong target. These targets are as follows (Nestlé, 2015):

1. By 2015 source 100 000 tons of cocoa through the Nestlé cocoa plan, plus the completion of 40 schools as a part of its school-building programme.
2. By 2016: Source 130 000 tons of cocoa through the plan plus begin the rollout of its child labour monitoring and remediation system to detect child labour in all Nestlé cocoa plan cooperatives in Côte d'Ivoire.
3. By 2017: Source 150 000 tons of cocoa through the Nestlé cocoa plan.
4. By 2018: Source 175 000 tons of cocoa through the plan.

Its progress in 2015 exceeded its objective of purchasing 100 000 tonnes of cocoa through the Nestlé cocoa plan. It also trained 44 617 farmers, distributed 1.6 million plants and achieved its goal of building or refurbishing 40 schools.

Commitment to sustainable coffee

"We need to secure supplies of high-quality coffee, but aging or diseased trees, declining yields, volatile prices and climate change threaten the livelihoods of smallholder farmers and the sustainability of the sector. Our response is to provide farmers with new routes to market, disease-resistant plants and technical assistance through the Nescafé plan and the Nespresso AAA sustainable quality programme" (Nestlé, 2015:25).

Nestlé's objective for 2015 is to improve the sustainability of the Nescafé SC by sourcing 180 000 tons of coffee from Farmer Connect, which is compliant with the Common Code for the Coffee Community's (4C) baseline sustainability standard (Nestlé, 2015).

Its progress in 2015 involved the achievement of the Nescafé sourcing objective by buying 225 600 tons of green coffee through Farmer Connect, 191 700 tons of which complied with the 4C standard, while Nespresso managed to source 85% of its coffee through its AAA programme. It also distributed 26.8 million plantlets to bring its cumulative total to 100.7 million plantlets (Nestlé, 2015).

Sustainable supplier code of conduct

Through Nestlé's code of business conduct and supplier code, it is actively encouraging employees, suppliers and stakeholders to report on practices or actions seen as being inappropriate or illegal. Nestlé investigates and assesses these reports and responds appropriately (Nestlé, 2015).

3.2.4.2. Sustainable reverse logistics effort

Nestlé has placed its RL efforts in three areas. These areas include the reduction of waste, the improvement of packaging and the use of a life-cycle assessment to decrease impacts. These areas will be discussed below.

Waste Reduction Efforts

Nestlé published its commitment to reduce food loss and waste in 2015. This highlights its commitment to avoid losses of raw materials and waste of food products, including in agriculture, manufacturing, distribution and consumer and post-consumer use; and its commitment to resource efficiency and waste by decreasing its direct and indirect use of resources, reducing waste and optimising opportunities for re-use, recovery or recycling (Nestlé, 2015).

In 2015, Nestlé achieved zero waste for disposal in 10% of its factories. Its goal is to achieve zero waste for disposal from all sites by 2020 (Nestlé, 2015).

Packaging alterations

"Our packaging is crucial to prevent food waste, guarantee our high-quality standards and inform our consumers, and we seek to optimise its weight and volume. We use eco-design tools such as EcodEX to assess the overall environmental performance of packaging throughout its life cycle" (Nestlé, 2015:34). Packaging is used to provide meaningful product communication and accurate environmental information about the

products, which can be used to help raise awareness among the millions of consumers who use the products (Nestlé, 2015).

Nestlé's objectives for 2017 are to: (1) continue its systematic analysis and optimisation of its packaging portfolio, with the goal of reducing the use of at least 100 000 tons of packaging material from 2015 to 2017; (2) use fact-based environmental information and display it on packaging which will enable consumers in all countries to make informed choices and better their own environmental impacts (Nestlé, 2015).

Nestlé's environmental targets are extremely ambitious. It aims to use only packaging that can be mechanically recycled, or can be used to make new products, by 2020. "Used packaging is a valuable source of raw materials. Even during the development phase, care should therefore be taken to ensure that a package is easy to sort automatically and amenable to subsequent recovery," to quote Dr Jochen Hertlein, at Nestlé responsible for packaging technology, talking to the food periodical Lebensmittel Zeitung (Der Grüne Punkt, 2015:20).

Due to the fact that Nestlé intends to create eco-friendlier packaging, it formed a project jointly with Der Grüne Punkt – Duales System Deutschland (DSD) (Dual System Germany). The project is developing solutions intended to facilitate the recovery of the recyclables involved. This project is an exemplary alliance worthy of attention throughout the FMCG sector (Der Grüne Punkt, 2015). Nestlé has tapped into DSD's expertise as part of their cooperative arrangement. Packaging design is a vital consideration in whether or not it can be efficiently recovered. "The recycling machines' efficiency is enhanced, for example, when labels are easily detached from the package proper. What's even better, though, is when both label and package are made of the same plastic material right from the start" (Der Grüne Punkt, 2015:20).

In the FMCG sector, companies need to analyse their packaging prior to every product launch or relaunch and improve it whenever and wherever necessary (Der Grüne Punkt, 2015). Nestlé in Germany has done just that: as a result of the partnership with DSD it has redesigned its Maggi Topfinito Tubs so that they can be easily sorted by the mechanical sorting machines used by Der Grüner Punkt. See

diagram 3.2 below.

Diagram 3.2 Redesigned packaging for Maggi Topfinto (Right) making for easier automatic sorting

Source: Der Grüne Punkt, 2015

Life-cycle assessment

Nestlé has incorporated life-cycle assessments (LCAs) results into Nestlé category sustainability profiles. LCAs are used "to build environmental sustainability into our products" and "systematically assess and optimise their environmental performance, across the entire value chain, at the earliest stage in the development of new and renovated products" (Nestlé, 2015:34). The LCAs can aid in summarising category-specific hotspots within the value chain and help find actions to address them along the value chain (Nestlé, 2015).

Nestlé's objectives are that by 2017: (1) it will have identified or updated and addressed sustainability hotspots for 15 product categories; and (2) have enlarged the scope of it databases on agricultural partners (Nestlé, 2015).

3.3 Local case studies

Being in a developing country tends to mean that developed countries' cases are more often referred to. However, it is important to look into local developments in

sustainable development in the SC to identify areas for improvement as well as ideas that companies in developed countries may have missed. Below are case studies from two popular South African retailers and their sustainable SC efforts.

3.3.1 Pick n Pay

Pick and Pay is one of the leading retailers in South Africa. Pick n Pay can also be found in Southern African countries like Namibia, Zambia, Botswana and Zimbabwe. Raymond Ackerman started Pick and Pay in 1967 (Pick n Pay, 2016).

3.3.1.1. Sustainable sourcing efforts

Pick n Pay believes that by reducing its environmental footprint it can be better at managing risks and achieve cost reductions. The key drivers for Pick n Pay's movement towards sustainability are the rising costs associated with electricity and fuel use, as well as the cost of sending waste to landfill (Pick n Pay, 2015). Its SC sustainability effort "focuses on two commitments: to support local, small-scale, black and women-empowered businesses, and to promote sustainable practices throughout our supplier network" (Pick n Pay, 2015:11). It is partnering with its suppliers on numerous sustainability initiatives to establish changes in sustainable product development, sustainable and transparent sourcing and packaging reduction and innovation (Pick n Pay, 2015).

Pick n Pay aims to improve its sustainable sourcing by focusing on multiple products and areas. These are discussed in detail below.

Sourcing of sustainable fish

Pick n Pay is a driver of change throughout its seafood SC. This is done to alleviate the risks of over-fishing. It is a longstanding funder and partner of World Wide Fund for Nature (WWF) sustainable seafood initiative. It has invested R13.5 million in the WWF sustainable fisheries programme since 2010. Pick n Pay is on track to meet its commitment to only sell 100% sustainably sourced seafood products by December 2015 (Pick n Pay, 2015). It will ensure that by the end of 2015, all its "seafood products are traceable to their origins and are labelled with their common name, scientific name, origin and method of catch" (Pick n Pay, 2015:13). Forty-five percent species of Pick n Pay's seafood products meet its seafood sustainability targets,

however, it is important to note that this is based only on species assessed by the WWF South African sustainable seafood initiative (Pick n Pay, 2015).

Commitment to animal welfare

Pick n Pay supports producers who proactively administer animal welfare and environmental issues (Pick n Pay, 2015). Pick n Pay (2015) is proud to state that 63% of its fresh produce suppliers are GLOBALG.A.P (good agricultural practice) certified.

In 2015 Pick n Pay laid out a new benchmark for South Africa's biggest food retailers when it made a commitment to accelerate pig welfare in South Africa. From 31 December 2015, all fresh pork sold in store must come from farms which use group housing for pregnant sows during their gestation period as this allows them to socialise and move about much more freely. By 31 December 2016, this commitment will cover all processed pork products sold by Pick n Pay. It is in the process of strengthening its audit process to reflect the new requirements, and is working closely with suppliers to guarantee the criteria are met (Pick n Pay, 2015).

Sustainable supplier relationships

Pick n Pay encourages its suppliers to attend several discussions pertaining to biodiversity farming methods (Pick n Pay, 2015). Its "technical division auditing process ensures that animal welfare standards are met, suppliers comply with labour legislation and organic suppliers are correctly certified" (Pick n Pay, 2015:14). Pick n Pay has also begun tracing ingredients with great environmental and social impacts, like palm oil and soya, to enable sustainable sourcing (Pick n Pay, 2015).

In 2015 Pick n Pay managed to achieve: a total of 94% of its fresh-food products procured from South African suppliers; its sales of Fairtrade coffee doubled; an 8.3% increase in sales of free range products; and it formed a partnership with Eco-Label SA to develop an African eco-labelling standard (Pick n Pay, 2015).

3.3.1.2. Sustainable reverse logistics efforts

Pick n Pay has focused its RL efforts on reducing waste. Its approach is discussed below.

Commitment to reduce waste

Pick n Pay has a three-tiered approach to managing its waste. This is to: (1) reduce waste generation; (2) divert waste from landfill; and (3) increase consumer recycling. It is actively managing its waste by donating any food that has passed its sell-by date, but not its expiry date, to FoodBank SA. In 2015 it participated in trials including the processing food waste into vermicompost, and converting fat and oil from its stores into biofuel and donated organic waste to recycling company AgriProtein, which uses it to create protein. Pick n Pay also provides collection points for consumers to recycle batteries, plastic bags, light bulbs and used ink cartridges (Pick n Pay, 2015).

In 2015 Pick n Pay recycled 45% of store waste, amounting to 19 861 tonnes. It donated 933 tonnes of surplus food to charity and 300 tonnes of food waste were composted in partnership trials. Pick n Pay also began selling imperfect, misshaped vegetables at discounted prices (Pick n Pay, 2015).

Pick n Pay's goal for 2020 is to reduce food waste to landfill by 20% (Pick n Pay, 2015). It is working on getting its employees, suppliers and stakeholders committed to its ambitions and targets.

3.3.2. Woolworths

Woolworths is a South African retail store chain, selling food, clothing, homeware and beauty products. Woolworths is well known in South Africa for being one of the greener supermarkets with a focus on sustainability.

3.3.2.1. Sustainable sourcing efforts

Woolworths has made the effort to try to improve the traceability of its products, by drilling down into its SC to drive sustainable sourcing practices for key commodities like timber, cotton, palm oil and cocoa (Woolworths, 2015). To ensure that sustainability is a focus throughout the organisation, Woolworths has focused on growing its employees' understanding of sustainability. It engages with employees regularly in order to increase environmental awareness and to better understand its sustainability focus and values. Since 2007, when Woolworths began its Good Business Journey in South Africa, it has managed to save through the business R567 million, thanks to the conscious efforts of its informed employees (Woolworths,

2015).

Woolworths has also placed attention on growing its partnerships for sustainability. Its experience has indicated that sustainability challenges cannot be solved alone. The support and input that it has received from a variety of stakeholders on programme like Fishing for the Future, Farming for the Future, EduPlant, customer recycling and sustainable transport has been vital (Woolworths, 2015).

Woolworths has made commitments to various areas. These are discussed below.

Commitment to sustainable agriculture

A high proportion of the environmental impacts that are created by Woolworths are linked to the farming and processing of products that it sells. Consequently, it makes it a part of its business to work together with suppliers to reduce these impacts, and positively influence the social and environmental outcomes of doing business (Woolworths, 2015).

Woolworths developed a programme to try to reduce the impacts of farming in its SC. This programme is known as Farming For The Future. The programme was designed to monitor, manage and transform the environmental performance amongst produce suppliers. The potential for this project to have great success was there due to the fact that over 90% of Woolworths food is sourced locally. Farming for the Future is Woolworths' independent audit and certification scheme whereby it works dynamically with farmers to gradually improve performance through enrichment programmes based on the specific needs of each farmer.

One focus is on encouraging the reduction of pesticide and fertiliser application or the replacement with and sustainable alternatives like efficient irrigation practices and soil conservation techniques. Ninety-eight percent of primary suppliers across produce, horticulture, wine and dairy obtained a pass, and a 73% pass rate was achieved among secondary suppliers, which is a big achievement considering that many were audited for the first time in 2015 (Woolworths, 2015). "This programme has proved to be a great success and we are seeing improvements in farm-level environmental management, greater productivity, efficiency, awareness and

innovation among suppliers as a result of this. Through Farming for the Future we have created a strong foundation for our engagement with suppliers on important challenges such as water stewardship and climate resilience" (Woolworths, 2015:13).

Woolworths' sustainable sourcing extends into the social sphere through the Woolworths enterprise development programme, which has been developed to support emerging black-owned businesses in its SC, including both primary and secondary suppliers. This programme is used as an instrument to eliminate barriers of entry into its SC for small, medium, black and black women-owned businesses (Woolworths, 2015).

Commitment to ethical sourcing

Woolworths is committed to ensuring that both it and its suppliers work in a way that maintains safe working conditions, protects the environment and the welfare of animals, upholds local employment laws and respects workers' rights (Woolworths, 2015).

Woolworths' approach to ethical sourcing is built around these key elements (Woolworths, 2015):

- Erecting internal capacities and awareness around ethical trade
- Guaranteeing it only works with business partners and suppliers who share its values
- Observing the performance of suppliers to detect issues
- Attending to problems where and when they arise in order to support suppliers to align with Woolworths best-practice requirements
- Constructing capacity along the SC, as a way to improve the social and environmental outcomes
- Regularly engaging with its stakeholders on ethical trade matters
- Working alongside others to confront multifaceted and systemic problems that cannot be tackled alone
- Focusing on driving transparency, in order to be open and honest about its challenges and successes.

Woolworths' 2015 goals were to achieve 95% compliance with its foods supplier compliance with its code of business principles; 95% compliance with clothing and general merchandise suppliers; and 75% of cocoa sourced for the Woolworths' private brand label chocolates to be UTZ certified (Woolworths, 2015). In 2015 it managed to achieve two of the three goals, and with the third it achieved 94% compliance instead of 95% with its foods supplier compliance with its code of business principles (Woolworths, 2015).

Woolworths supports the following ethical sourcing principles (Woolworths, 2015):

- That employment must be chosen freely, not forced or involuntary prison labour
- That employees have the freedom of association and the right to collective bargaining
- That there are safe and hygienic working conditions
- That absolutely no child labour will be permitted
- That labour should be paid at least minimum wages
- That there are no excessive working hours
- That discrimination will never be tolerated
- That regular employment is provided
- That no harsh or inhumane treatment will be allowed
- That there will be a visible commitment to compliance with all relevant environmental regulations and laws, with a commitment to environmental efficiency and improvement over time
- That animals are treated in a manner that minimises the potential harm, stress or pain to animals
- That bribes, favours, benefits or other similar unlawful payments, given to obtain business are prohibited
- Commitment to the principles of broad-based black economic empowerment (BBBEE).

Woolworths has eight focus areas for its ethical sourcing efforts. These include deforestation, sustainable palm oil, coffee, cocoa, cotton, leather, seafood, animal and welfare. Each of these aspects will be discussed in detail below to illustrate

Woolworths' commitments.

Deforestation

"Woolworths recognises the environmental and social importance of safeguarding the world's last remaining ancient and endangered forests, as well as the role of reducing deforestation and forest degradation in mitigating climate change. We are committed to reducing and eventually removing deforestation and forest degradation from our direct operations and supply chain. This commitment includes systematically removing commodities from our supply chain that cannot be traced from a sustainable source, and therefore may potentially have been illegally harvested; that come from an area of high conservation value and/or, were obtained in violation of traditional and civil rights" (Woolworths, 2015:64).

Through its engagement with customers, suppliers, certification bodies and NGO partners Woolworths' aim is to increase both awareness and demand for sustainably sourced forest products. Woolworths is working towards using only recycled or sustainably sourced wood products throughout its business operations. It will work to guarantee that all timber and paper used is chain of custody certified through the Forest Stewardship Council (FSC) (Woolworths, 2015).

Woolworths is also committed to working with industry and NGO partner Canopy to change the fabric SC towards better practices, which protect the forests and endangered species habitat. It is doing this by eliminating its usage of fabrics made of dissolved pulp (e.g. rayon, viscose and modal), which have contributed to deforestation. Woolworths aims to meet this commitment by 2020 (Woolworths, 2015).

Sustainable palm oil

"It is Woolworths' policy to avoid the use of unsustainable and untraceable palm oil. Our intention is to only use certified sustainable palm oil in our own brand products. Woolworths was the first South African company to become a member of the global Roundtable on Sustainable Palm Oil (RSPO) and since 2011, has been purchasing GreenPalm certificates to offset the many tons of palm oil used by our suppliers in Woolworths' food and beauty products each year" (Woolworths, 2015:65).

GreenPalm Certification is due through the form of payment whereby a portion of the payment from each certificate goes towards incentivising Malaysian and Indonesian palm oil growers to become RSPO-certified sustainable producers. Woolworths states which type of oil used in each product on the ingredients panel of the packaging (Woolworths, 2015).

To speed up matters, Woolworths is engaging with local South African oil refineries and encourage them to import certified sustainable palm oil and become chain-of-custody certified. The progress made so far includes the change from GreenPalm Certification by Woolworth's biggest manufacturer of foods containing palm oil to the use of mass balance sustainable palm oil (Woolworths, 2015). Ultimately Woolworths wants to see all its "suppliers converting to a 'segregated' supply of RSPO-certified sustainable palm oil, but this will only be possible in a few years' time when the demand for certified sustainable palm oil in South Africa grows to a scale where it is viable to transport fully segregated palm oil from origin through transport, storage and refining to end product" (Woolworths, 2015:65).

Coffee

Woolworths made a commercial decision to no longer pay the higher cost and to move away from the FairTrade certification. It has begun to put people and systems in place to source coffee directly from farmers. This will allow it to work the same way it does with other suppliers. Woolworths will work in a mutually beneficial manner with its suppliers to better the supply and quality of the coffee beans, while at the same time paying fair prices, which allow the suppliers to contribute to the development in their surrounding communities (Woolworths, 2015).

Cocoa

By sourcing UTZ-certified cocoa for Woolworths' private label chocolate it provides a declaration that the cocoa has been grown and harvested responsibly. The programme also helps farmers to improve the yield and quality of their cocoa crops while empowering them to take better care of their workers and families and decreasing the impact on the environment. Woolworths is currently sourcing 75% UTZ-certified cocoa. It is on its way to meeting its target of sourcing 100% UTZ-certified sustainable cocoa for all Woolworths' private label chocolates by December

2016. It has also made the commitment to source 100% UTZ-certified cocoa to be used as an ingredient in all Woolworths branded foods by June 2018 (Woolworths, 2015).

Cotton

Woolworths is a member of the Better Cotton Initiative (BCI). It joined the initiative as part of its commitment towards sourcing more sustainable grown cotton for its fashion and to help transform the cotton sector (Woolworths, 2015). "The BCI aims to create long-term change by helping farmers to grow cotton in a way that reduces stress on the local environment and improves the livelihoods of farming communities. It is a global approach that provides a solution for the mainstream cotton industry, including both smallholders and large-scale farmers. All farmers can benefit from implementing Better Cotton Principles and the development of a new and more sustainable mainstream commodity, Better Cotton" (Woolworths, 2015:67). Woolworth's aim is to have at least 15% of its cotton fibre changed to Better Cotton by 2017.

Leather

Woolworths is working towards developing increased traceability within its SC to guarantee that the leather used in its products does not contribute towards forest degradation, deforestation or, animal cruelty (Woolworths, 2015).

Seafood

Woolworths is deeply committed to sourcing all its seafood from sustainable fisheries and responsible fish farming operations. It has set time-based sustainable seafood commitments and continues to work with a variety of partners, including the Marine Stewardship Council (MSC) and WWF-SA. Currently 85% of the seafood sold by Woolworths meets its sustainability commitments for 2015, which is up from the 2014 results of 82%. 9% is made up of different species that have not been assessed by the WWF-SASSI, and the remaining 6% does not yet meet the commitments. Of the seafood volume meeting its commitments, 62% of it is WWF-SASSI green-listed which is up from the 48% in 2014. Woolworths does not sell any WWF-SASSI red-listed species (Woolworths, 2015).

Animal welfare

In the past year Woolworths has made progress with regards to animal welfare. All of its manufacturers are instructed to promote animal welfare by decreasing any potential stress, harm or pain to animals, and obeying the relevant national and international animal welfare standards (Woolworths, 2015).

Woolworths is the only major South African retailer to solely sell free-range whole eggs. Woolworths sources some 120 million eggs every year, sold in cartons, and as pasteurised liquid eggs used in food products. Currently, over 95% of Woolworths private label food products are now using free-range eggs (Woolworths, 2015).

Sourcing free-range pork is challenging in South Africa. Woolworths has placed its focus on tackling the practices used in intensive pig farming. These practices include the use of sow stalls. In August 2014 Woolworths began selling pork which was sourced from farms that only keep sows in stalls for one week during the gestation period. Once the pregnancy is confirmed the sows are placed in group housing which allows them to move around and socialise (Woolworths, 2015).

Woolworths is working towards establishing a wildlife-friendly lamb SC. It has committed R4.7 million over a three-year period to the development of its vision. The funds are being distributed to key NGOs operating in Southern Africa, namely: Conservation South Africa, the Cape Leopard Trust, the Landmark Foundation and the Endangered Wildlife Trust. These NGOs are tasked with recruiting farmers for the programme to trial several non-lethal predator control methods like the use of llamas, alpacas, Anatolian guard dogs, protective collars and shepherds to safeguard livestock. Woolworths will then source lamb from the farmers in the programme. The programme is generating useful data which Woolworths can share with other farmers in its SC to help with the reduction of indiscriminate predator control, while at the same time helping to better the farmer's commercial viability by decreasing stock loss. The hope is to start having the first lambs from this programme in stores from the end of 2015 (Woolworths, 2015).

In response to animal welfare concerns Woolworths stopped ordering products comprising of angora in January 2014 (Woolworths, 2015).

3.3.2.2. Sustainable reverse logistics efforts

Woolworths has put its efforts to increase the sustainability of its RLs into two areas, namely: waste reduction and packaging improvements. These are discussed below in detail.

Waste reduction

Woolworth's operations are currently working towards achieving zero waste to landfill. Sadly in South Africa there is a major challenge in that the infrastructure for recycling still remains underdeveloped and limited. Despite this challenge, Woolworths sent just 6.73% of the 225 503kgs of its waste from its head office to landfills, and 6.17% of the 9 650 623 93kgs of waste from its distribution centres to landfills during the 2015 financial year. It achieved a 83% recycling rate from the distribution centres and a 93.9% recycling rate from the head office. Woolworths has also employed a recycling pilot project across 40 of its stores, which is achieving a recycling rate of 53% (Woolworths, 2015).

Woolworths donates excess clothing plus pre-owned clothing from employees and customers to the Clothing Bank. The project goal is to empower unemployed women from disadvantaged areas in South Africa by teaching them life skills, as well as giving them the financial and career development knowhow to start their own sustainable micro-clothing businesses. This successful programme is presently being replicated across South Africa with outlets in Johannesburg, Cape Town, Hermanus, Paarl and Durban. This programme not only creates employment but also helps divert surplus textiles from ending up in landfill (Woolworths, 2015).

The need to address food waste quantities cannot be overstated. In South Africa, it is estimated that there is upwards of 9 million tonnes of food waste per annum. This represents 600 000 litres of embedded water and the energy usage comparable to that required to power Johannesburg City for 20 years (Woolworths, 2015). Woolworths has an ongoing initiative whereby it donates surplus food that would otherwise end up in landfills to various charities. In the 2015 financial year it donated R490 million worth of food to charities (Woolworths, 2015).

Woolworths has committed to introducing a new nationwide programme, which will

support the recycling of customers' waste. This will be done by providing recycling facilities at selected Engen service stations, Woolworths' stores and schools around the country. In the Western Cape, Gauteng and KwaZulu-Natal there are currently recycling facilities at 50 Engen service stations, and at 21 schools in the Western Cape (Woolworths, 2015).

In store, Woolworths is continually finding new ways to reduce and recycle waste; like using recycled plastic in the lugs boxes used in the transportation of products to and from stores, and recycling all packaging used to protect the clothes during transit transportation, including hangers (which are made of recycled material, just like its store signage, shopping baskets and trolleys) (Woolworths, 2015). Woolworths also recycles all waste printer cartridges from its stores. In 2015 it diverted 4 290kg of cartridges from landfill. The earnings collected from the recycling initiative is donated to the charity Cotlands (Woolworths, 2015).

Packaging alterations

End-use waste of Woolworths' products continues to be an area of large improvement. In 2015, Woolworths made an effort to reduce the amount of packaging used in its products by 511 tons, which has resulted in more efficient transportation, increased carbon savings and reduced raw material usage. It is also working on the following product changes: (1) light-weighting its packaging, (2) working towards improving product design for ease of separation to help improve the level of at home recycling, (3) increasing the amount of recycled materials used in packaging, to reducing virgin raw materials consumption from our operations and (4) the formulation of an on-pack labelling system for recyclability, which will be an industry first in South Africa (Woolworths, 2015).

Packaging reduction is an important environmental factor Woolworths is trying to address, but packaging is needed to make sure that products continue to stay protected. It is also critical to extend shelf life so that food waste is not created. To Woolworths, this means using packaging responsibly (Woolworths, 2015). It is committed to achieve this by (Woolworths, 2015):

- Using the lightest weight materials which will still do the job

- Buying packaging materials from verified renewable sources where possible
- Boosting the use of packaging materials with recycled content in them to create a market for consumer waste and help form a recycling economy
- Design packaging holistically to optimise overall environmental performance and considering the possibility for end-of-life recycling
- Working with many bodies to encourage the development of more recycling facilities and infrastructure to make recycling easier
- Printing simple, clear labels on all packaging to help customers identify what packaging material is used and know if and how it can be recycled
- Taking advice from leading experts and customers to deliver its goal of responsible packaging
- Increasing its understanding of the impact packaging has on climate change and using this better in decision-making.

A performance snapshot from the 2015 financial year includes the 92 packaging improvements made among the Woolworths' private label products: the 511 000 kg reduction in packaging weight due to light weighting packaging material; the 98% of products in packaging made of recyclable materials; and the 41.5% of rigid packaging containing post-consumer recycled plastic material (Woolworths, 2015).

3.4. Conclusion

From the commitments and successes of international and South African businesses one can see that companies are definitely seeing the importance the SC has for their businesses and the environment. By redesigning packaging, using recycled materials and compressing product offerings companies are not only helping to save money but are helping to reduce their impact on the planet.

One area that can still be seen as an area for concern, despite the high level of commitment by companies, is palm oil. The GreenPalm Certification is unfortunately proving to be an easy way out, whereby firms are able to pay their way into the green economy by selling unsustainable palm oil with a GreenPalm certification on it

because they have bought the certifications and a portion of the funds have gone to try promote sustainable palm oil production.

In Chapter three there were many different topics that reappeared when looking at the six chosen case study companies. The topics that stood out were: sustainable sourcing of palm oil, animal products, coffee, timber products and cocoa. There was also a focus on the companies' codes of conduct, their waste management systems, their supplier relationships and their efforts to support small-scale farming developments. The last aspect that was addressed multiple times was the traceability of commodities within the SCs of the companies discussed.

CHAPTER FOUR
COMPARISON AND ANALYSIS

4.1 Introduction

In a world of highly intelligent academics and fast-moving business operations it is important to look at where the two worlds meet and where they can be of help to each other. In this case, one can find the point of overlap by looking at both the theories discussed in Chapter 2 and the case studies laid out in Chapter 3 by finding real-world examples of where academic theories are being applied successfully in day-to-day business developments.

Chapter four will address finding the overlap between sustainability theories for businesses and the actual sustainability activities commissioned by four international companies and two South African firms. The chapter will be divided into two main parts, namely: the sustainable sourcing comparison and the reverse logistics comparison. It will look at the theories which are applicable to the FMCG companies discussed in the case studies.

4.2. Comparison between theories and practice

To decipher if a theory is successful one needs to assess its impact and potency in the real world. Below, the discussion will begin around which theories are implemented in reality, and by whom they are implemented.

4.2.1 Sustainable sourcing comparison

Sustainable sourcing theories are not as clear-cut with a list of rules and guidelines. They tend to revolve around a few ideas of how companies can better their procurement practices. The main ideas which were discussed in Chapter 2 concerning sustainable sourcing included: (1) a firm's influence over its suppliers; (2) the importance of bettering the small-scale farming industry; (3) holistic purchasing strategies; (4) forming partnerships with suppliers; and (5) the use of a supplier code of conduct.

These five ideas can be divided into two main topics. The first is the supplier relationship, which includes a firm's influence over its suppliers, the importance of bettering small-scale farming, forming partnerships with suppliers, and the use of a supplier code of conduct. The second is the change in buying strategies, i.e. holistic purchasing strategies. This involves the ways and means businesses use to source their raw materials and commodities.

There is a third topic which was not addressed directly in the theories but was evident in the cases. This is the importance of partnerships for businesses with NGOs. These partnerships will form the third area of discussion below.

4.2.1.1 Supplier relationships

As discussed earlier, supplier relationships expand to include (1) the firm's influence over its suppliers; (2) the importance of bettering small-scale farming; (3) forming partnerships with suppliers; and (4) the use of a supplier code of conduct.

Companies' influence over suppliers

When companies use their influence over suppliers good things can arise. In the cases covered in Chapter 3 one can notice two areas whereby positive change has been established through the use of companies' influences. These are animal welfare, and traceability or chain of custody.

Woolworths, Nestlé, McDonald's, Pick n Pay and Procter and Gamble have all made it clear that they do not have room for suppliers in their SC who create unnecessary harm or distress on animals both wild and domestic. In terms of traceability, McDonald's has committed to improving its traceability of its timber-based packaging materials (McDonald's, 2015). Nestlé has made a commitment to improve traceability of its key commodities (Nestlé, 2015). Pick n Pay has stated that it intends to trace the origins of soya and palm oil in the SC (Pick n Pay, 2015). Woolworths has committed to ensuring the traceability of its leather products to guarantee users that the leather has in no way contributed to deforestation and animal cruelty (Woolworths, 2015).

Investing in small-scale farming developments

Most of the companies covered in the case studies have made commitments to aiding and developing the abilities of farming communities through investments and expert advice.

Woolworths has its enterprise development programme whereby it aids in the support and empowerment of new black-owned companies (Woolworths, 2015). It also has its Farming for the Future programme which works with farmers to get them certified independently and complying with the specifications laid out by the programme. Farmers are supported through an enrichment programme to attend to their individual needs (Woolworths, 2015). It has moved away from FairTrade coffee towards working closely with farmers and aiding the development of farming communities (Woolworths, 2015).

McDonalds has invested in the training of farmers in its coffee SC (McDonald's, 2015). Procter and Gamble has put resources into the development of small-scale farmers in its palm kernel oil SC to help to improve the farming practices and livelihoods of the farming community (Procter and Gamble, 2015). Unilever has its enhanced livelihood investment initiative whereby it has allocated a minimum of $10million to be used for the improvement of access to smaller producers and to the bettering of income and livelihoods of small-scale farming communities around the world (Unilever, 2015).

Nestlé has given attention to small-scale farming development in its cocoa and coffee SCs. The Nestlé cocoa plan distributes strong saplings to farmers and trains farmers in better agricultural practices. The Nescafé plan and Nespresso AAA sustainable quality programme provide farmers with new routes into the market with the distribution of disease-resistant plants and technical assistance (Nestlé, 2015).

Partnerships with suppliers

Businesses like McDonald's, Unilever, Woolworths and Pick n Pay have formed direct relationships with their suppliers in order to ensure quality and achieve their sustainability goals. McDonald's formed its relationships with suppliers after realising that the majority of their impacts on water, land and air were occurring in its

SCs. These relationships have helped it achieve its ethical, environmental and economic goals (McDonald's, 2015).

Pick n Pay has begun getting its suppliers to attend discussions on biodiversity respectful farming techniques. This, alongside its auditing process of its suppliers has had an impact on ensuring animal welfare standards improve, as well as certifying the organic status of multiple farms (Pick n Pay, 2015).

Woolworths has focused on its partnerships in order to grow its level of sustainability throughout its SC. It has developed programmes like Farming for the Future, Fishing for the Future and EduPlant to achieve its sustainability goals (Woolworths, 2015).

Both Unilever and McDonald's have gone a step further in developing roundtables. McDonald's helped found the Global Roundtable for Beef, with the aim of bringing the various players in the beef industry together to establish a common goal for sustainability (McDonald's, 2015). Unilever was a founding member of the Roundtable on Sustainable Palm Oil (RSPO). It helped form the RSPO as it is one of the largest global consumers of palm oil and realised the impact the palm oil industry was having on both people and the plant (Unilever, 2016d).

Supplier code of conducts

McDonald's, Procter and Gamble, and Nestlé have detailed supplier codes of conduct, which they use to ensure their supplier base adheres to their minimum requirements for quality and sustainably goals. Unilever also has a supplier code of conduct but has taken it a step further with an agricultural code of conduct, which informs farmers of standards and aspects they need to adhere to.

4.2.1.2 Holistic purchasing strategies

Most businesses have made some effort across the board to source their commodities in a more sustainable way. They have formulated codes of conduct and supplier management plans. The discussion below will focus on a few areas in which the largest changes and progress is being made; and where changes need to be made.

Palm oil is a commodity that is getting a lot of negative attention despite its impressive oil-bearing fruit. Companies like McDonald's, Unilever, Procter and Gamble and Woolworths have made changes to their SCs to ensure sustainability. McDonald's has committed to using only RSPO or GreenPalm Book and Claim Certificates in all of its products from suppliers by 2020 (McDonald's, 2015). Procter and Gamble's palm oil SC has faced much scrutiny over the past few years, and the company has taken steps to ensure customer satisfaction by agreeing to have a deforestation-free palm oil SC. It is taking further steps to ratify palm-derived products to ensure it is not supporting deforestation and community displacement (Procter and Gamble, 2015). Woolworths is the first South African company to join the RSPO. Its aim is to stop using unsustainable and untraceable palm oil in its SC (Woolworths, 2015).

Unilever's palm oil goal is lofty. It aims to achieve a complete overhaul of the palm oil industry to 100% sustainable by 2020. It has formed an agreement with Wilmar, a supplier of over a third of the global palm oil, in which it will only supply products that are not linked to deforestation and human rights violations (Unilever, 2015). To top it off, Unilever has a new sustainable palm oil sourcing policy to help ensure it only buys palm oil that will help it reach its goal. To achieve its goal it has focused on buying the majority of its palm oil from a few suppliers who are committed to its policy and meet its requirements (Unilever, 2016b).

Seafood and especially fish has been the focus of many documentaries and awareness campaigns due to the current rate of global overfishing. Companies that deal in fish and seafood products are beginning to change which species they will sell. The WWF in South Africa has developed a consumer tool under its SASSI project whereby it rates the sustainability of different fish species as green, orange or red. Green means that it is a best choice to eat as the fish stocks remain safe and the fishing practices used to harvest them are not too invasive. Orange means think twice; this is where there is not enough data to be sure that the fishing practices and stock levels are not in danger, or that it is a species whose stock levels are dangerously low. Red means do not buy; these are seafood products like abalone and Bluefin tuna which have been overexploited to such an extent that they are near extinction. SASSI has developed an

easy-to-use app for consumers to install on their phones so as to be able to make informed choices at restaurants and supermarkets.

Both Pick and Pay and Woolworths have teamed up with WWFs South African sustainable seafood initiative programme to ensure they are stocking and selling seafood that is not harming different populations and incomes for responsible fishing operations, and not contributing to overfishing. Woolworths and McDonald's have joined forces with the MSC to add clarity to their choice of fish species.

Coffee is an industry which has been an area of social and environmental injustices like poor remuneration and deforestation. Companies like Nestlé and Woolworths have taken steps to try to ensure their SCs are free from these issues. Nestlé sources green coffee through Farmer Connect which is compliant with the Common Code for the Coffee Community standard (Nestlé, 2015). Woolworths has opted to deal directly with suppliers to ensure that the quality of the coffee it sells is up to scratch and that the remuneration standards are fair (Woolworths, 2015).

Cocoa is the key ingredient in chocolate and who doesn't love chocolate? Perhaps the children in West Africa taken out of school to harvest cocoa pods might not like it as much as the western world. The cocoa industry is rife with child labour (especially in West Africa), human rights violations, deforestation and soil degradation. Through NGO certifications like UTZ's, better crops, better income, a better environment and a better life for communities and families of cocoa farmers is advocated (UTZ, 2016). Woolworths is currently sourcing 75% of its chocolate products from UTZ-certified sources (Woolworths, 2015).

Timber, wood and lumber are synonyms for wood products acquired from trees globally. Timber is linked globally with deforestation, poor water management and illegal logging of indigenous forests. Many products are made from timber, including paper, tissues and furniture to name a few. McDonald's, Procter and Gamble and Woolworths have all made commitments towards better timber management practices.

4.2.1.3 Partnerships with NGOs

Every company discussed in the case studies, both local and international, has formed alliances with multiple NGOs. NGOs like WWF, FSC, RSPO MSC and the Rainforest Alliance appear repeatedly throughout the cases.

The WWF and the RSPO have the most mentions across the companies. The WWF is key in helping companies to identify areas of concern in the SC. "WWF engages with major companies and their supply chains to change the way global commodities are produced, processed, consumed, and financed worldwide" (WWF, 2016a). The WWF believes that "lasting conservation is achieved through collaboration with a range of extraordinary partners, including governments, local communities, businesses and individual donors" (WWF, 2016b). The WWF-SASSI programme is a big reason for the partnership between WWF and the two local cases of Woolworths and Pick n Pay.

The RSPO has been active since 2004 and has been "transforming the palm oil industry in collaboration with the global supply chain, to put it on a sustainable path" (RSPO, 2016). McDonald's, Procter and Gamble, Unilever and Woolworths have all joind the RSPO to help improve palm oil SCs.

4.2.2 Sustainable reverse-flow comparison

Sustainable RL theories are unfortunately not a clear list of rules and guidelines. They are, however, slightly more structured than sustainable sourcing theories. They tend to revolve around different ways in which companies can improve their procurement practices. The main ideas, discussed in Chapter 2 concerning sustainable RL, include waste prevention techniques through product design management, and product recovery management.

4.2.2.1 Product design

Product design is an area that can have a huge influence over the impact a product creates to the environment, the surrounding community and the people who use it. Products can be designed to be beneficial to a multitude of different areas including the environment, sustainability, disassembly, recyclability, serviceability and the product life cycle. There are two design theories that are not covered in the FMCG

sector, namely: design for serviceability and design for remanufacture. Below are five design strategies linked to their uses in the case studies discussed in Chapter 3.

Design for sustainability

The easiest way to explain design for sustainability is when a product is designed for the people, the planet and to make profit. When a product is designed under this method one must look at both the cost implications to the company and the consumer, as well as its health and safety impacts and its usability.

Procter and Gamble, Unilever and Woolworths have product offerings which were designed for sustainability. Procter and Gamble has been proactive in its packaging for transportation. It has eliminated boxes for its large packs of Pampers diapers in most parts of Western Europe. This has allowed it to reduce the amount of packaging materials used to deliver a product but still ensure the same product standard (Procter and Gamble, 2015). By making this change it has resulted in having 400 fewer trucks on the road (Procter and Gamble, 2015), which helps the local community as it decreases industrial congestion and results in lower CO_2 emissions.

Unilever changed the formulation of its laundry detergents that now need less water to clean (Unilever, 2015). Its industry-leading compressed aerosol aluminium spray cans are the result of an impressive product redesign. This redesign has resulted in 25% less aluminium and half the amount of propellant gas being used in each can. It is important to note that the same amount of product fits into these compressed 75ml cans as fits into the traditional 150ml cans (Unilever, 2015). Unilever has also changed the way it sells concentrated laundry liquids. These are now being sold in eco-packs that can be used as stand-alone packs or as refills for existing laundry bottles. These eco-packs use 70% less plastic (Unilever, 2015). Unilever's Handy Andy is now being sold in eco-packs locally (Unilever, 2016e). Consumers are benefiting from the lower price of packaging and Unilever is saving money on the packaging costs.

Woolworths has stated that it has reduced the amount of packaging used in its private label products by 511 tons to increase carbon savings, reduce raw material usage, ensure more effective transport and reduce end-use waste (Woolworths, 2015).

Design for environment

Design for the environment is when a company designs its product offering with the environment in mind. It will look at material selection, reduction in waste streams and the reduction of non-renewable raw materials. Procter and Gamble, Woolworths and Nestlé have all adopted this line of design in some of their product offerings.

Procter and Gamble (2015) has laid out the following 2020 goals: (1) having 100% renewable or recycled materials used in all products and packaging; (2) reducing packaging by 20% per consumer use; and (3) doubling the use of recycled plastic resin in packaging. Nestlé's (2015) objective for 2017 is to reduce its packaging portfolio by 100 000 tons. Woolworths' (2015) aims are to: (1) use lighter weight packaging; (2) increase the amount of recycled materials used in its packaging thereby reducing the use of virgin plastics, and creating a local market for recycled plastics.

Design for disassembly

By designing a product for disassembly one is designing a product with the aim of easily being able to salvage the raw materials used in its production. This design type is not very common in the FMCG sector. Examples can, however, be found in the Nestlé and Woolworths case studies.

Nestlé Germany (2015) has redesigned its Maggi Topfinto with the help of Der Grüner Punkt so as to allow the packaging to be sorted automatically in recycling plants. Woolworths (2015) has begun changing the design of its products in order to allow for easier separation of different packaging materials to allow for easier home recycling. It has also started work on a packaging labelling system that shows consumers what kind of material that packaging is made from and how it can be recycled.

Design for recyclability

Designing a product for recyclability involves the assessment of the materials used in a product and it's packaging to determine if it can be recycled after use of the product.

This design technique can be seen from the McDonald's and Procter and Gamble case studies.

McDonald's has joined forces with its supplier and is trying to make its packaging of its food products more recyclable to reduce post-consumption waste (McDonald's, 2015). Procter and Gamble has the goal to ensure that 90% of its packaging is recyclable or that there is a plan in place to facilitate the recycling of the product (Procter and Gamble, 2015).

Design for life cycle

Design for life cycle is found where designers look at the entire life cycle of a product and not just focus on the impacts created during manufacturing and assembly but through all seven stages of the product's life cycle. These seven stages are: need, design, production, distribution, usage, disposal and recycling (Arnette *et al.,* 2014).

Nestlé is the only company that made a brief mention of its life-cycle viewpoint for product design. It has integrated the life-cycle assessment into its Nestlé category sustainability profiles to ensure that it incorporates sustainability into its multiple product offerings (Nestlé, 2015).

4.2.2.2 Product recovery

In Chapter 2 many product recovery techniques were discussed, including: repairs, remanufacture, refurbishment, recycling, re-use, replacement, reclamation and reconfiguration, to name a few. In Chapter 3 the cases discussed only covered one of these product recovery methods, which is recycling. Recycling in the FMCG industry can be divided into two sections. These are in-house recycling, which is where the companies' offices, distribution centres and manufacturing sites are covered; and end-use/consumer recycling which covers recycling done by consumers who have used the companies' products.

In-house recycling

An acronym that is much used is ZWTL, which means zero waste to landfill. There are different aspects to ZWTL, like zero manufacturing waste, zero distribution waste, and zero office waste, but ultimately the goal across all is to not send any waste from

different sections of the SC to landfills and ensure that all waste produced can be and is recycled. All six companies discussed in Chapter 3 have some form of waste management plan in place for in-house waste.

McDonald's 2020 goal is to increase its restaurant recycling to 50% in its top nine markets. It is currently recycling in-house cooking oil and cardboard (McDonald's, 2015). Procter and Gamble (2015) has set its 2020 goal of zero manufacturing and consumer waste to landfill. It has currently achieved ZMWTL at 52.3% of its global manufacturing sites. Unilever (2015) achieved ZMWTL in 2014 across its global factory network of 240 factories in 67 countries. Nestlé currently achieves 10% ZWTL but its 2020 goal is to have 100% ZWTL across its global network of factories.

In South Africa, Pick n Pay (2015) has a three-tiered approach to waste management. It aims to reduce waste creation, divert waste from landfills and increase consumer-recycling practices. It donates edible food waste to FoodBank SA. Woolworths (2015) is trying hard to achieve ZWTL but unfortunately the recycling industry in South Africa is not very developed. Hence, some waste that is recycled in other countries cannot be recycled locally and must go to landfills. Woolworths states that it has only sent 6.73% of head office waste and 6.17% of distribution waste to landfills. Woolworths also has a clothing donation scheme whereby it donates excess and employees' and customers pre-owned clothing to The Clothing Bank. Woolworths donates surplus and past sell-by-date food items to various charities.

End use/consumer recycling

Consumer recycling is a tricky business as the success of end-use recycling depends on end users and their views on recycling. Unless countries have laws to enforce recycling, the action of recycling depends highly on consumers who are willing to separate their household waste. Another hindrance to end-use recycling is the existence and developments of recycling infrastructure in different countries. Take Stellenbosch (Western Cape) and Johannesburg (Gauteng) as examples. Stellenbosch has municipal recycling initiatives, whereas most of the Johannesburg municipalities do not have recycling collection or sorting initiatives. Compare that to Germany

where all municipalities collect various bins into which consumers have sorted different materials.

Pick n Pay (2015) provides in-store recycling points for plastic bags, batteries, ink cartridges and light bulbs. Woolworths (2015) has set up recycling points at Engen garages and certain schools to help consumers recycle locally.

4.3 Conclusion

Many of the applicable theories discussed in Chapter 2 can been found in the case studies mentioned in Chapter 3. It was surprising to see how well the South African companies, especially Woolworths, held their own against the large international companies.

Unfortunately, due to the nature of the FMCG industry in which the case studies were done, many of the theories were not covered. Areas not covered include; (1) firm engagement with their suppliers about sustainability, and (2) the use of refurbishment, repair, remanufacture and the serviceability of their products. One can conclude that different theories are aimed at different industries. It would be interesting to do a comparison using technology companies like Apple, Samsung, LG and Microsoft and compare their practices to the theories. It might reveal a whole different way of using the theories discussed in Chapter 2.

Some shortfalls, which can be noted as McDonald's, include: the lack of in-store recycling of take-away packaging, and a scheme to deal with food waste from its restaurants. In its sustainability report it failed to include the majority of the developing countries in its statistics. This is unfortunate as results from those countries would change the look of its brand's sustainability. It is important to note that McDonald's should place importance on countries where its products have a high negative impact.

In Chapter four the main area covered was the comparison between theory and practice, with the addition of the importance of forming partnerships with NGOs which was not discussed extensively in the theory. With regards to product design

only four of the design methods were covered extensively in the cases. These are design for sustainability, design for environment, design for disassembly and design for recycling. Looking at the overall commitment by the companies in the case studies, as well as the FMCG industry as a whole, the main product recovery method clearly is recycling.

The overlays in the theories and practical which were identified will provide the foundation for the development of the checklist in the following chapter.

CHAPTER FIVE
CHECKLIST AND FINDINGS

5.1 Introduction

Benchmarking is an important means for businesses to identify their level of success within an industry. A checklist that companies can use to compare their performance with that of competitors can be a useful tool.

In Chapter 4 the comparison between theory and practice was made. It identified which companies were making use of which strategies. In Chapter 5 there will be a summary of the different strategies, which companies actually use as reflected in Chapter 4, followed by a checklist other companies can use to assess how they compare to some of their fellow FMCG companies. This checklist will also enable companies to see which areas need addressing and where they are doing well.

5.2 Findings

The strategies used by the six case studies discussed in Chapter 3 will be discussed below.

5.2.1 Sustainable sourcing findings

The three main strategies used in sustainable sourcing include supplier relationships, holistic purchasing strategies, and partnerships with NGOs. The core components of these theories will be discussed below.

Supplier relationships are used to gain traction towards a company's sustainability goals. This can be seen when companies make use of their suppliers to ensure their goals are reachable. Companies can use three different methods to ensure their suppliers are aiding them in attaining their goals. First, companies can help with the development of small-scale producers to ensure that they produce in a manner which suits the firm's requirements. By doing this the company does not just help small business but aids in the creation of jobs and skills within that sector. It is important to

note that it is not enough to just identify the best suppliers, but companies can help to develop their small-scale suppliers to compete with the rest.

The second method that can be used is companies using their influence over suppliers to force them to change their current practices to meet those that support sustainability. This method may sound like bullying suppliers into a process they might not be accustomed to, but ultimately if the supplier's customer base demands changes towards more sustainable requirements it would make economic sense for the supplier to change its ways to retain its customers, rather than not changing and losing its customer base. Jason Clay (2010) of the WWF explains this concept in his TED Talk on how big brands can save biodiversity: "[Companies] don't care what the price of commodities are, if they don't have commodities they don't have business" (Clay, 2010:13;45). So their transformation towards sustainability is about how businesses want to be in business in the future. Along with this, Clay (2010) describes how big brands and companies have more power over suppliers than end-use customers do, and they can help the transition to sustainability take place faster.

The third aspect is to develop a detailed supplier code of conduct to be followed by a company's suppliers. A supplier code of conduct is the extension of a firm's values and expectations. It is a critical component for managing suppliers. It creates a foundation on which suppliers can make informed decisions. When looking at the social issues covered in a supplier code of conduct, the firm should refer to the UN Declaration of Human Rights and International Labour Organisation's Core Conventions and Recommendations, which cover a broad range of issues on which companies need to ensure adherence. When referring to the environmental aspect of the code of conduct, there are different mandatory requirements in different industries. When looking at the voluntary requirements for a code of conduct for individual businesses, the importance of collaboration and discussions with stakeholders is vital for discovering the most important areas to address in a code of conduct. After the development of the code, it should be used as a framework for suppliers to adhere to.

A holistic purchasing strategy has been developed by companies through their need to no longer just buy what is cheapest but to incorporate externalities into their raw

materials and products. This has led to companies using their code of conduct to guide them in how and what they are buying. One can see changes in the way companies are addressing labour concerns in developing nations, as well as water usage, animal rights, forestry management and how commodities are harvested. Companies are also placing importance on buying materials which are certified by third-party accredited organisations like FSC timber products and MSC or SASSI seafood. These aspects all contribute to a more holistic purchasing method for companies.

Partnerships with NGOs is not discussed much in the literature, yet it was evident in the case studies that big businesses are making use of the knowhow that NGOs have gained in working towards a more sustainable future. By joining forces with NGOs like the WWF and the RSPO companies can benefit not only from their knowledge and teamwork but once their products have reached their joint goals they are able to benefit from endorsements by NGOs, which carries weight with consumers globally.

5.2.2 Reverse flow findings

Sustainable product design has the ability to make or break the sustainability of a product. If a product is not designed with sustainability in mind the probability is that it will land up on a landfill and add to the global pollution problem. The most prevalent design techniques in this study were: design for sustainability, design for environment, design for disassembly, design for recyclability and design for life cycle. Each of these techniques has a particular area in which it is aimed and focused to increase and improve the sustainability of the product, through the design phase of said product.

The product recovery process is the last stop for RL and involves what is done with the product once it has been consumed or has reached the end of its lifespan. Many products can be disassembled and have their various components recycled and re-used. However, it is important to note that if a product was not designed with this phase in mind the end result of the RL movement will likely be landfill as disassembly and recycling is not an option.

There are two main methods of product recovery covered in this study and these are in-house recycling and end-use/consumer recycling. In-house refers to the waste

management within companies' operations from its offices, production facilities, distribution centres and head offices. The main commitment being taken by in-house recycling is zero waste to landfill. This is where all waste generated through the businesses operations are recycled or re-used.

End-use/consumer recycling is far more complex for businesses to deal with. How does a company ensure that its product that is designed to be disassembled and recycled actually ends up in the recycling process? Even if a company designs its products to be made out of recyclable materials in the product design phase there is no guarantee that consumers will do their role of separating waste and recycling it. This becomes especially tricky in developing countries where infrastructure is lacking. Even in some developed countries the act of recycling is not mandatory and therefore is not regulated, and waste products, which could end up back in the raw material stream, end up in landfill sights. This raises the question as to whether a product whose market is in developing nations without infrastructure needs to have a different design model focusing on the biodegradability of the product and its packaging so that its impact on the area in which it is consumed is reduced, or whether a company should become actively involved in creating infrastructure to try and reduce the impact of its products in that region.

5.3 Sustainable sourcing and reverse logistic checklist for business

The checklist in table 5.1 was developed to help businesses identify areas where they can improve their sustainability in regards to sourcing by taking the finding from Chapter 4 and compiling a checklist of areas where the leading firms are operating.

Table 5.1: Checklist for Sustainable Sourcing

Checklist for Sustainable Sourcing			
Questions	YES	NO	WORKING ON IT
1. Does your firm use its influence over it's suppliers to increase and ensure sustainability?			
2. Does your firm invest in small-scale farming development within your raw material Supply Chain?			
3. Does your firm have partnerships with suppliers to increase and ensure sustainability?			
4. Does your firm have a detailed Supplier Code of Conduct to increase and ensure sustainability?			
5. Does your firm have a set of sustainable sourcing goals and aims?			
6. Are these aims and goals continuously being driven forwards?			
7. Are there checks and balances in place to ensure that suppliers are adhering to the Code of Conducts to enable your firm to reach its goals?			
8. Does your firm's goals focus on both social and environmental issues?			
9. Does your firm have established relationships and partnerships with NGOs?			

In areas where firms have either said no or are working on it, they need to see that these areas are addressed and changes made to increase the level of sustainability within their SC.

The checklist in table 5.2 was developed to help businesses identify areas where they can improve their sustainability in regards to reverse logistics by taking the findings from Chapter 4 and the product recovery techniques mentioned in Chapter 2 and compiling a checklist of areas where the leading firms are operating.

Table 5.2: Checklist for Sustainable Reverse Logistics

Checklist for Sustainable Reverse logistics			
Questions	YES	NO	WORKING ON IT
1. Has your firm designed any of your products according to any of the following design methods? If so which? i. Design for Sustainability ii. Design for Environment iii. Design for Disassembly iv. Design for Recyclability v. Design for Life-cycle			
2. Does your firm produce any products which can be recovered in the following manners? If so which? i. Repaired ii. Remanufactured iii. Reused iv. Recycled v. Reconfigured vi. Refurbished			
3. Does your firm actively ensure the usage of the product recovery methods? If so which? i. Repaired ii. Remanufactured iii. Reused iv. Recycled v. Reconfigured vi. Refurbished			
4. Does your firm currently use any Product design strategy to aid in the recovery of products? If so, in which areas? i. Repaired ii. Remanufactured iii. Reused iv. Recycled v. Reconfigured vi. Refurbished			

In areas where firms have either said no or are working on it, they should focus their efforts on these areas to address and make changes to increase the level of sustainability within their SC. It is, however, important to note in the reverse logistics sphere that not all industries are the same and many product offerings cannot use all the different methods as explained in Chapter 4 with the FMCGs.

5.4 Shortfalls

There are four main shortfalls that can be identified in this study. These are discussed below.

5.4.1. Non-renewable inputs

A product is only as renewable as its inputs. If a product or its packaging is made of non-renewable resources, it makes no difference how it is sourced and what supplier relations are like; the product will ultimately be unsustainable. The checklist in Table 5.2 does not take this into account, so companies must use their own discretion to judge the renewability of their inputs to assess sustainability.

Take plastic as an example; plastic is made from oil-based compounds. Oil is a finite resource. Plastic can be recycled and re-used, but this process has a lifespan. Plastic can only be recycled a certain number of times before it becomes waste. Look at aluminium as a comparison; aluminium is also a finite resource but it has an infinite life cycle when looking at recycling. Glass too has an infinite life cycle. These aspects need to be taken into account when companies make decisions regarding product design and packaging. This framework does not have a specific section to deal with the pros and cons of individual resources.

5.4.2. Goals not always reached

Just because a company sets a goal and at the time of completing the checklist it is driving it forward does not guarantee that this will remain the case. If the firm undergoes a change in management, or its focus changes slightly, goals can be forgotten and never reached. The resources and people committed to the goals could be relocated and transferred by the new management team to a new focus area, leaving the old goals insufficiently equipped.

Many of the companies discussed in Chapter 3 had set goals to achieve particular sustainability goals by 2020. This does not mean that they are sustainable in that area yet. It is important that one waits to ensure that these goals are met, and are not swept under a rug and not mentioned in sustainability reports of the year to follow.

5.4.3. Infrastructure issues

Infrastructure issues are by far one of the most pressing issues if one looks from a developing country's perspective. FMCGs are manufactured and distributed to hundreds of countries, not all of which have the infrastructure to handle waste produced from these products. Look at South Africa as an example. South Africa is seen as being one of the most westernised and developed African countries. However, it does not have the capabilities and infrastructure to handle the recycling of many everyday products. Johannesburg municipality has no recycling collection scheme to recycle PET bottles, which are one of the most-used products globally. So consumers toss them in with other non-recyclable waste, which is destined for landfills.

Look at the new trend of coffee pods which has developed not only locally but internationally. In South Africa Nestlé's Nespresso is one of the only pods made from aluminium; the rest of the pods are produced using forms of plastic. The downside of the Nespresso pods is that they require a specialised machine to separate the components and only then the aluminium can be recycled. One of these machines is owned by Oricol environmental services located in Johannesburg (Oricoles, 2014). When one looks on the Nespresso webpage for its recycling efforts in South Africa nothing can be found. However, YuppieChef (2016) contacted them directly and wrote up an article to advise its clients on the process of recycling pods locally. All Nespresso pods sold in South Africa can be recycled if they are returned to one of six Nespresso boutiques in South Africa. These six stores or not widely spread out: there are two in Cape Town, two in Johannesburg, one in Pretoria and one in Durban. The few pods that are returned to the stores are transported by road to Johannesburg to the Oricol site to be separated and recycled (YuppieChef, 2016).

When one looks at Nestlé's other coffee pod brand, Dolce Gusto, its pods are made out of plastic. On its webpage under FAQs, Nestlé states that its pods are not recyclable. "We are exploring a number of possible solutions and hope to provide an update on our plans shortly." (Dolce Gusto, 2016).

When large multinational FMCG companies look at the sustainability of their products they need to take into account what happens to their products and their

packaging after use in countries where mandatory recycling is not enforced and not even an option. The framework discussed in this study does not take this into consideration and neither do the international case studies addressed in Chapter 3. Companies need to see how they can help improve the infrastructure in developing countries so that they can handle the by-products produced from their products.

5.4.4. Narrow focus

Due to the length and time constraints of this study it only covers two of the many aspects found in SCs. These two areas include sourcing and reverse logistics. This framework only gives a company a narrow view on its overall sustainability achievements. Future studies can look into the complexities of sustainability in manufacturing, distribution and logistics.

5.6 Conclusion

There is no exact science to sustainable sourcing and sustainable reverse logistic, there are so many variables to take into account. So much of SC sustainability comes from what information is available and what are the best solutions individual companies can deduce from that information. One thing that can be said with certainty is that companies globally are realising there is a need to improve their sustainability if they wish to do business in the future.

The shortfalls are many but the efforts by companies are continuously improving; whether that be because of external stakeholder pressure or not, at least firms are being held accountable for their actions and products' impacts. The checklist provided in this chapter is only one of many aspects that companies can address to improve the sustainability of their SC and assess where they fit in relation to their competitors.

The main area covered in Chapter five was the formulation of the checklists for companies to use to assess their current sustainable sourcing and reverse logistic efforts, to see where they can improve and to place their focus on strategies that will improve their sustainability.

CHAPTER SIX
CONCLUSION

6.1 Introduction

The previous chapters covered a multitude of topics and sources. This paper has looked into environmental issues experienced globally, what sustainable development is and how business fits into the development of sustainability. It then took a more focused look at SCs and how companies' SCs can impact sustainability. The focus was narrowed by only looking into details of the various theories pertaining to two areas of the SC, namely sourcing and reverse flow.

The chapters before have addresses the real-world happenings of these two areas of SCs by looking into the activities of four international companies and two local market leaders with regards to sustainability. By using the details obtained and by making a comparison between their theories and practices two checklists were developed for the use by companies to assess where their SC actions are lacking in terms of sustainability.

Chapter six provides a concise overview of all the topics discussed in this paper in order to assess if the methodology was effective and if the objectives of the study were met. This chapter also points out areas which future research can be done and how other researchers can extrapolate on the topics covered in this paper.

6.2 Conclusions

In order to assess if this paper achieved its objectives, one needs to revisit the original objectives. The objectives of this paper were laid out in Chapter one. They were the following:

1. Exploring the sustainability theories available for sustainable sourcing and reverse flow of SCs
2. Looking at international and domestic sustainable practice theories
3. Developing a compact and simplified checklist for what sustainable sourcing and reverse flows within SSCM should contain in order to aid environmental preservation.

Each objective will be discussed below, and whether it was achieved.

6.2.1 Objective 1

The first objective was to explore the sustainability theories available for sustainable sourcing and reverse flow of SCs. This objective was met in Chapter two.

With regards to sustainable sourcing the theories covered in the chapter included: (1) the importance of development with small-scale producers of raw materials who can get away with not adhering to mandatory environmental regulations as they fall beneath the minimum production volumes. (2) The use of a company's influence over its suppliers to ensure the goods supplied are in line with the company's goals towards sustainability; basically a company can rely on its expenditure with a supplier to force it through the threat of changing supplier if it does not comply with requirements. (3) The formulation of purchasing strategies that are inclusive is another area discussed. This pertains to the need to ensure that purchasing strategies are in line with the three spheres of sustainability. (4) The use of relationships and partnerships with a firm's suppliers. Forming relationships and partnership with suppliers can help to achieve a mutually beneficial effort for both parties. (5) The implementation of a supplier code of conduct was also covered in Chapter two. It covered the three main topics within the code, namely: human rights and labour concerns, environmental concerns and anti-corruption considerations. The use of a code of conduct for suppliers forms the framework, which should be adhered to by the procurement team, as well as by suppliers.

Reverse logistic theories covered include: (1) The prevention of waste through the usage of product design. (2) The various product design methods are discussed, including design for sustainability, design for disassembly, design for recyclability, design for remanufacture, design for environment, design for serviceability and design for life cycle. (3) The multiple product recovery methods were covered in detail comprising of repair, re-use, remanufacture, recycling, refurbishment and reengineering.

6.2.2 Objective 2

The second objective was to look at international and domestic sustainable practice theories. This was covered in detail in Chapter 3 through the use of case studies of six different companies in the FMCGs sector.

With regards to sustainable sourcing, the companies in the study had the commonalities with a few topics, these included the following: (1) Sustainable sourcing of timber products, palm oil, animal products, coffee and cocoa. This means that the majority of the companies made mention of how they are or are intending to ensure that their sourcing of the above-mentioned commodities is both ethical and sustainable. (2) The need for firms to improve the traceability of the products they purchase has been discussed. This need arises not only from the need to reduce the risk of brand damage when consumers find out that the raw materials used in the brands product are unsustainable, but also due to consumer pressures to know where materials come from and voluntary standards within industries. (3) The importance of supplier relationships is discussed, as brands do not want their products to be connected with unethical labour practices and unsustainable harvesting of raw materials. (4) The use of small-scale farmer development is mentioned by many firms as they use this as a way to uplift the communities around the farming activities and to teach and instil the sustainability principles they wish to receive from their suppliers into the farming practices of these small-scale producers. (5) The benefits of forming partnerships with NGOs and certified supplier bases is covered, mentioning WFF, FSC and RSPO often throughout the various case studies. These partnerships tend to be mutually beneficial where companies benefit from NGOs expertise and experience and NGOs are able to achieve their goals with the commitment of businesses.

When one looks at the practical examples of reverse logistics principles discussed in Chapter three, the examples are sadly not as prevalent. However, there are still two main areas covered and these are product design and waste management. The most widely used methods for product design are design for sustainability, design for environment, design for disassembly and design for recycling. As the case studies are focused around the FMCGs industry this could be seen as the reason why design for remanufacture and design for serviceability were not covered. When one looks at the

examples given for waste management, the main areas addressed were recycling, looking at both in-house recycling through zero waste to landfill and by end-consumers, by looking at packaging selection and raw material choices.

6.2.3 Objective 3

Objective three was to develop a compact and simplified checklist for what sustainable sourcing and reverse flows within SSCM should contain in order to aid environmental preservation. This objective was obtained by looking at the comparison of theories and practices in Chapter 4, and presentation of the checklists in Chapter 5.

The checklists for sustainable sourcing and reverse logistics are both compact and simple to understand. This can serve as a useful tool for businesses in the FMCG industry to assess the sustainability within the sourcing and reverse logistics aspect of their SCs.

6.3 Recommendations for Future Research

Throughout the study the author identified many areas for future research. If one was to do the same study using the same literature covered in Chapter two but change the focus to industries involving electronics and developing technology products it would be enlightening and the areas of focus in all sections would differ compared to this study. A comparison between the SC sustainability of Apple, Samsung and Microsoft could be very educational.

One could also take the same principles of this study by comparing theory and practice to take a detailed look into middle sections of any company's SCs like distribution, production, transportation and warehousing. One could then look into machine efficiency developments, joined load logistics, environmentally friendly transportation solutions, factory location benefits and sustainable inventory management principles, to name but a few.

Another interesting angle would be to look into different companies within similar industries, like Cargill and Afgri which are big suppliers of raw materials to various

industries, and do a comparison between these two suppliers in terms of the sustainability of their SCs.

One could look into beauty product manufacturers like MAC, Revlon, L'Oreal and Lancôme to see how their sourcing and reverse flow management compare. What could be highlighted are their animal-testing practices, their impact on the environment through waste management, and the chemicals used in the creation of their beauty products.

One of the shortfalls mentioned in Chapter five noted that not all the aspects covered in the case study have been achieved yet. This means that there is room for these goals to be achieved. Future research could investigate if these firms' 2020 goals were indeed reached, or if they were forgotten.

As a lead-on from another issue mentioned in Chapter five with regards to infrastructure issues, a future study could look into requirements needed to address this shortage and bring the South African environment up to speed with average international levels so as to eliminate this as a shortfall locally.

6.4 Concluding Remarks

By no means is this paper without its shortfalls, but it has covered a wide area of reference with regards to sustainability within the SC. By looking into SC sustainability theories and practices one can see that there is clear progress by big brands towards sustainability within their SCs. Whether this is enough to change the destiny of this planet is up to the reader to judge. However, something is always better than nothing.

The main contribution of this paper was to illustrate what the differences between theories and practice are and to develop checklists for companies to use to assess their progress. This was done throughout the various chapters. Hopefully, this paper can help to determine the progress that companies are making in years to come by using it as a baseline for comparison of future research. It is clear that more future changes

and improvements throughout the SC are required, if business is to help to improve the health of the human population and the planet globally.

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