The Spread of Environmental Sustainability Practices
in Business Networks

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Abstract

The study investigates *how* and *why* environmental sustainability (ES) practices spread between organisations in business networks. The Industrial Marketing and Purchasing (IMP) network approach is adopted as the theoretical foundation to allow for a multi-perspective analysis of the interactions between the numerous organisations influencing an entity’s environmental policies and practices, such as government departments, industry organisations, competitors, environmental advocacy groups, consumers, customers, suppliers, suppliers’ suppliers and so forth. Understanding the spread of ES practices is relevant to lead companies and brand owners, governments and international organisations, among others, who have a need to extend ES practices in supply chains, industries and the world, respectively. An analysis of spread is important in light of the *lack* thereof in certain supply chain tiers, industries and countries. Three case studies were conducted in the Western Australia (WA) pork and dairy industries. The data consists of 34 in-depth interviews and documentary analysis including a ten year review of the Sustainability Reports of the large Australian supermarkets (Coles and Woolworths), as well as UK and USA comparative supermarkets. An abductive approach to theory building is used where the empirical data is iteratively compared to prior IMP network, (green) supply chain management, diffusion of innovations and complexity science literature, until a theoretical saturation point is reached. An event-based approach to process analysis is used and case comparisons performed. A key process of spread of ES practices in both the pork and dairy industries is the slow, steady momentum of spread arising from decades of enacting and enforcing environmental legislation, regulations and reporting requirements. Fourteen macro-processes of spread are identified. The study highlights that the spread of ES practices arises from *multiple, interacting* processes of spread occurring in series and in parallel. Each of these processes in turn is seen to arise from further sub-processes of spread in an iterative progression. The findings show that the processes of spread, factors influencing spread and events making up the processes of spread can be analysed at various levels of aggregation, such as the international, national, state, industry, supply chain, dyadic and organisational levels. The study contributes a holistic categorisation of the processes of spread of ES practices in business networks, the factors influencing the spread of ES practices and characteristics of ES practices affecting their spread.
The study provides an application of the event-based approach to process research in business networks, contributing data and further insights into the narrative sequence analysis (Buttriss & Wilkinson 2004; Buttriss & Wilkinson 2006) and Event-based Network Process Analysis (Halinen, Törnroos & Elo 2013) techniques. At a theoretical level, the study extends the conceptualisation of ‘process’ in business networks by providing an expanded definition of ‘process’ and submitting the idea of upward and downward ‘cascading’ of multiple, interacting processes. Further, the study contributes to the concept of ‘levels’ in the study of processes in business networks. The study adds to the scarce literature concerning ‘issue-based nets’ by providing empirical data and success factors relating to their formation and operation. Finally, the study contributes an empirically informed framework for understanding the spread of environmental sustainability practices in business networks.

*Environmental sustainability, business networks, network process analysis, network change, issue-based nets*
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<tbody>
<tr>
<td>A$</td>
<td>Australian dollar</td>
</tr>
<tr>
<td>AAAC</td>
<td>Australian Association of Agricultural Consultants (WA) Inc.</td>
</tr>
<tr>
<td>ABM</td>
<td>Agent Based Model</td>
</tr>
<tr>
<td>AFGC</td>
<td>Australian Food and Grocery Council</td>
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<td>APC</td>
<td>Australian Packaging Covenant</td>
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<td>APL</td>
<td>Australia Pork Limited</td>
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<td>ARA</td>
<td>Activity-Resource-Actor</td>
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<td>AusVeg</td>
<td>Australian Vegetable Growers Association</td>
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<tr>
<td>CAS</td>
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<td>CFF</td>
<td>Carbon Farming Futures</td>
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<td>CFI</td>
<td>Carbon Farming Initiative</td>
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<td>COAG</td>
<td>Council of Australian Governments</td>
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<td>CPRS</td>
<td>Carbon Pollution Reduction Scheme</td>
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<td>CRPs</td>
<td>Current Recommended Practices</td>
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<td>CS</td>
<td>Complexity Science</td>
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<td>CSIRO</td>
<td>Commonwealth Scientific and Industrial Research Organisation</td>
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<td>CSR</td>
<td>Corporate Social Responsibility</td>
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<tr>
<td>DAFF</td>
<td>Australian Government, Department of Agriculture, Fisheries and Forestry</td>
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<tr>
<td>DAFWA</td>
<td>Government of Western Australia, Department of Agriculture and Food</td>
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<tr>
<td>DairySAT</td>
<td>Dairy Environmental Self-Assessment Tool</td>
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<td>DEC</td>
<td>Government of Western Australia, Department of Environment and Conservation</td>
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<td>DER</td>
<td>Government of Western Australia, Department of Environment Regulation</td>
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<tr>
<td>DfT</td>
<td>Dairying for Tomorrow</td>
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<td>DoE</td>
<td>Australian Government, Department of the Environment</td>
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<td>DOI</td>
<td>Diffusion of Innovations</td>
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<td>DoP</td>
<td>Government of Western Australia, Department of Planning</td>
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<td>DoW</td>
<td>Government of Western Australia, Department of Water</td>
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<td>EEO Act</td>
<td>Energy Efficiency Opportunities Act</td>
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<td>Abbreviation</td>
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<tr>
<td>EMAS</td>
<td>Eco-Management and Audit Scheme</td>
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<td>EMS</td>
<td>Environmental Management Systems</td>
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<td>eNPA</td>
<td>Event-based Network Process Analysis</td>
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<td>EPBC Act</td>
<td>Environment Protection and Biodiversity Conservation Act</td>
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<td>ERF</td>
<td>Emissions Reduction Fund</td>
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<td>ES</td>
<td>Environmental Sustainability</td>
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<td>ESCD</td>
<td>Environmental Supply Chain Dynamics</td>
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<td>EU</td>
<td>European Union</td>
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<td>FFF</td>
<td>Farming for the Future</td>
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<td>FRDS</td>
<td>Future Ready Dairy Systems</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GFC</td>
<td>Global Financial Crisis</td>
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<td>GMO</td>
<td>Genetically Modified</td>
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<td>GRI</td>
<td>Global Reporting Initiative</td>
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<td>IGA</td>
<td>Independent Grocers of Australia</td>
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<td>IMP</td>
<td>Industrial Marketing and Purchasing</td>
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<td>ISO</td>
<td>International Organisation for Standardisation</td>
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<td>NFF</td>
<td>National Farmers’ Federation</td>
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<td>NGER Act</td>
<td>National Greenhouse and Energy Reporting Act</td>
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<td>NGER scheme</td>
<td>National Greenhouse and Energy Reporting scheme</td>
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<td>Non-Governmental Organisations</td>
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<td>NPA</td>
<td>National Pig Association (UK)</td>
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<td>NPI</td>
<td>National Pollutant Inventory</td>
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<td>NEPM</td>
<td>National Environment Protection Measure</td>
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<td>NRM</td>
<td>Natural Resource Management</td>
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<td>R&amp;D</td>
<td>Research and Development</td>
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<td>Regional Development Programme</td>
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<td>RSPCA</td>
<td>Royal Society for the Prevention of Cruelty to Animals</td>
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<td>SCM</td>
<td>Supply Chain Management</td>
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<td>SMRC</td>
<td>Southern Metropolitan Regional Council</td>
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<td>SR</td>
<td>Sustainability Report</td>
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<td>SVN</td>
<td>Sustainable Value Networks</td>
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<td>UK</td>
<td>United Kingdom</td>
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<td>Abbreviation</td>
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<tr>
<td>UN</td>
<td>United Nations</td>
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<td>UNFCCC</td>
<td>UN Framework Convention on Climate Change</td>
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<td>Uni</td>
<td>University</td>
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<td>USA</td>
<td>United States of America</td>
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<td>UWA</td>
<td>University of Western Australia</td>
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<td>VSM</td>
<td>Viable Systems Model</td>
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<td>WA</td>
<td>Western Australia</td>
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<td>WALGA</td>
<td>Western Australia Local Government Association</td>
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<td>WAPPA</td>
<td>Western Australia Pork Producers Association</td>
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<td>WAFF</td>
<td>WA Farmers’ Federation</td>
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<td>WQA</td>
<td>Woolworths Quality Assurance</td>
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<td>WWF</td>
<td>World Wildlife Fund</td>
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I appreciate the insightful recommendations by the reviewers.
CHAPTER 1 - INTRODUCTION

1.1 Research context

Organisations face increasing demands from stakeholders to be ‘sustainable’ (Seuring & Muller 2008a; Linton, Klassen & Jayaraman 2007; Seuring & Muller 2008b; Gupta, Rudd & Lee 2014), which requires management of not only the economic aspects of business, but also a number of social and environmental aspects, known as the ‘sustainability triad’ (Seuring & Muller 2008b; Othman & Ameer 2009; European Commission 2011). ‘Sustainability’ generally refers to ‘sustainable development’ in the way defined by the United Nations World Commission on Environment and Development in the ‘Brundtland Report’ (i.e. as “development that meets the needs of the present without compromising the ability of future generations to meet theirs” (UN WCED 1987, p. 8)). The terms ‘sustainability’, ‘corporate social responsibility’ (CSR) and ‘triple bottom line’ tend to be used synonymously (European Commission 2011).

The concept of sustainability can be traced back to practices of many ancient cultures (Linton, Klassen & Jayaraman 2007). However, while environmental and social aspects of business have been considered in the literature and practice for decades, the focus on sustainability increased in the late 1980s and, by the 2000s, most academics, politicians and practitioners accept a consideration of ‘sustainability’ issues is inescapable (Jones 2011). This is reflected in the suggestion that “sustainability is not likely to fade away and is becoming the flag of excellence in our decade, similarly to the quality movement of the 1980s” (de Brito, Carbone & Blanquart 2008, p. 537). ‘Sustainability’ has been examined in a range of fields (e.g. ethics, ecology, economics, industrial ecology, ecological economics, supply chain management, marketing, systems theory and complexity theory) (Jones 2011; Espinosa & Walker 2011) and has deep roots in the physical and social sciences (Linton, Klassen & Jayaraman 2007).

Within this broader sustainability context, the current study focuses on the environmental sustainability (ES) aspect of the sustainability triad; while recognising the inter-dependence of the three facets. ES issues faced by organisations include adhering to environmental laws and regulations and meeting increasing demands.
from consumers for environmentally-friendly products and processes (Zhu, Sarkis & Geng 2005; Srivastava 2007). To manage these ES issues, many organisations have implemented additional intra- and inter-organisation ES practices (Handfield, Sroufe & Walton 2005; Vachon & Klassen 2006; Simpson & Samson 2010).

1.2 ES practices

‘ES practices’ are organisational practices that seek and/or result in an improvement in the organisation’s own and/or other organisations’ ES performance; where ‘ES performance’ denotes a measure of an organisation’s impact on the environment (such as on water, soil, air and biodiversity). Indicators of ES performance feature in sustainability reports. For example, Wesfarmers Ltd (owners of Coles supermarkets) 2013 sustainability report provided measures of greenhouse gas emissions, energy use, water consumption, waste reduction and rehabilitation, reflecting their ES performance (Wesfarmers Ltd 2013b).

Intra-organisation ES practices include the design of ‘environmentally-friendly’ products (Rao 2002) and the implementation of appropriate environmental management systems (EMS) (Gonzalez, Sarkis & Adenso-Diaz 2008). Inter-organisation ES practices include green supply chain management (Srivastava 2007) and green purchasing practices (Min & Galle 2001). Inter-organisation ES practices may themselves be viewed as processes of spread of intra-organisation ES practices, while also being ES practices that can be spread. For example, a green purchasing practice is an inter-organisation ES practice that may spread the use of ES practices from the buyer to the supplier. At the same time, the green purchasing practice itself may be spread to other organisations when they too employ green purchasing with their suppliers. The literature points to many motivations and barriers influencing an organisation’s decision to implement intra- and inter-organisation ES practices.

1.3 Motivations and barriers to adopting ES practices

The motivations for organisations to adopt ES practices may arise internally within the organisation, such as to gain a competitive advantage, to avoid fines for non-compliance with regulations, to reap cost savings due to efficiencies and to mitigate the risk of financial and reputational damage in the event of environmental disasters (Cousins, Lamming & Bowen 2004; Hall 2000; Handfield, Sroufe & Walton 2005).
Motivations or pressures may also arise externally from consumer advocacy groups, consumers, buying companies, culture or legislation (Hall 2000; Vachon 2010).

In addition to motivations, organisations may also encounter barriers to incorporating ES practices, such as the costs of ES practices, a lack of market demand for environmentally-friendly products and processes, a lack of technical ability to adopt ES practices, a lack of top management support and a perception ES matters are secondary to business issues (England & White 2009; Hall 2000; Vachon & Klassen 2006; Kovacs 2008). A further barrier to implementation is that many ES practices relate to ‘public goods’ (Chander, Drèze & Lovell 2007). Pure public goods have two defining features:

1) Non-rivalry – meaning one person’s enjoyment of a good does not diminish the ability of other people to enjoy the same good.
2) Non-excludability – meaning people cannot be prevented from enjoying the good.

Examples include air quality, water quality, biodiversity and a stable climate (Kotchen 2012). Market failure can be associated with public goods in that the market will produce too little public goods (Kotchen 2012). Public goods can lead to ‘externalities’ and a ‘free rider’ problem in the absence of government intervention. For example, when a company implements an air pollution mitigation practice, it bears the cost, while the neighbourhood, and, by extrapolation, the world, reaps the benefit. Rogers (2003) refers to a further and related issue, termed the ‘tragedy of the commons,’ through which individuals following decisions that are of personal benefit may not lead to outcomes that benefit the collective.

Exacerbating the ‘public good’ and ‘free rider’ problem is the fact that laws and regulations governing ES practices and enforcement differ between nations and industries (Kotchen 2012). It is therefore unsurprising that the use of ES practices varies across companies, industries and countries (Hall 2000; Zhu & Sarkis 2006; de Brito, Carbone & Blanquart 2008). For example, the use of ES practices has historically been higher in North America and Europe than in China (Hall 2000). Within China, Zhu and Sarkis (2006) found industry differences in the drivers and ES practices implemented. Given these differences in the uptake of ES practices, as well as the motivations and barriers to their adoption, there are various stakeholders
who are interested in the *spread* of ES practices along supply chains, within industries and countries.

1.4 ‘Spread’ of ES practices

The dictionary defines the verb ‘spread’ as follows: “To become distributed or widely dispersed” and “to increase in range of occurrence; become known or prevalent over a wide area” (TheFreeDictionary.com 2013, p. 1). In the current study, the processes of *spread* of ES practices refer to *the processes that result in ES practices increasing in range of occurrence and becoming known or prevalent over a wide area*. The current study does not concentrate on the spread of a *specific* ES practice but, instead, considers spread to occur when an organisation implements *any* ES practice. Thus, if pressure from Buyer A results in Supplier B reducing their use of single use plastic packaging and results in Supplier C installing solar panels on their factory roof, this is a ‘spread’ of ES practices from A to B and C. If Buyer D, a competitor of Buyer A, hears of these changes in practices from common Supplier B and decides to improve its ES practices and urges its suppliers to do the same, spread has occurred from A to B and C directly and from A to D and its suppliers, indirectly through B. Thus, ES practices have spread, even though identical ES practices have not occurred. What is important is that the change occurring in the affected companies is concerned with ‘ES’; hence the recurrent nature of spread.

The term ‘spread’ brings to the fore Rogers’ (1962) concept of the ‘diffusion’ of innovations, as well as the notions of the ‘propagation’ and ‘transmission’ of changes from the Industrial Marketing and Purchasing (IMP) network theory (Håkansson & Snehota 1995). As will be explained in section 2.5, ‘spread’ in the current study *included* the concept of diffusion, but is not limited to Rogers’ formal definition of diffusion. ‘Spread’ can be thought of as equivalent to ‘propagation’ and ‘transmission’, but the current study seeks to begin with a more neutral approach to exploring this inter-disciplinary topic and so defines ‘spread’ in the way already noted. The following section discusses the stakeholders who are interested in the occurrence of spread of ES practices.
1.5 Stakeholders interested in the ‘spread’ of ES practices

The stakeholders concerned with ‘spread’ include lead companies, governments, international organisations, consumer advocacy groups and consumers, as illustrated by the following examples. Lead companies and brand owners may be concerned with the spread of ES practices, as they are often held accountable not only for their own ES performance, but also for the ES performance of their supply chain (Kovacs 2008; Seuring & Muller 2008b; Rao & Holt 2005; Lee 2010). Governments’ interest in the spread of ES practices to various organisations and industries in their economies arises from their need to comply with international agreements regarding ES issues, such as climate change, as well as ensuring the protection of the country’s natural resources. International organisations, such as the United Nations (UN) and Greenpeace, are interested in the spread of ES practices globally. This international interest in ES issues is demonstrated by international agreements such as the Kyoto Protocol and the establishment of the UN ‘Green Climate Fund’ in 2010, which aims to mobilise millions of dollars from developed countries to support projects, programmes, policies and other activities in developing countries targeting ES objectives (UN 2010). Consumers and consumer advocacy groups may be interested in the spread of ES practices based on personal values and preferences. Some of these stakeholders actively try to promote the spread of ES practices, as discussed in the following section.

1.6 Actions to promote ‘spread’ of ES practices

Stakeholders may engage in ES practices to promote their spread. For example:

- Lead companies may engage in green supply chain management (SCM), green supplier development and green purchasing practices.
- Governments may implement environmental laws, regulations, fines, incentives and projects.
- International organisations may establish international agreements and funds.
- In a more bottom-up approach, consumer advocacy groups and consumers may engage in campaigns and use consumer complaints and buying preferences to support environmentally-friendly practices and products.
Despite these measures, the spread of ES practices often falters in supply chains, industries and countries.

1.7 Lack of ‘spread’ of ES practices

The spread of ES practices often seems to stop at the first-tier supplier level of lead companies. For example, the Toyota Australia 2010 Sustainability Report indicated that, while CSR activities (which includes ES activities) are being spread to first-tier suppliers, first-tier suppliers are not actively deploying these activities to second- and third-tier suppliers (Toyota 2010). This corresponds with Kovacs’ (2008, p. 1572) suggestion that environmental purchasing measures are scarce in practice and rarely extend beyond first-tier suppliers and that “little is done to extend these measures to several echelons, to say nothing of enforcing them in the ultimate supply chain.”

The lack of spread beyond first-tier level of lead companies can be problematic, as the most significant ES performance impacts often occur at lower level suppliers. For example, PUMA published an “Environmental Profit & Loss Account” that presents environmental indicators across PUMA’s supply chain (PUMA 2011). They found raw material production at the fourth-tier supplier level, where raw materials are derived from natural resources, had the highest greenhouse gas emissions and water consumption impacts. PUMA had previously been working with first-tier suppliers, rather than targeting fourth-tier suppliers, where the most significant ES interventions could have been made (PUMA 2011). This highlights the importance of the spread of green practices to all supplier levels.

The lack of spread of ES practices could relate to the lack of prioritisation of ES objectives. Vachon and Klassen (2006, p. 801) found that, “while there is growing pressure for environmental criteria to be a major factor in the design and management of supply chains, environmental issues tend to still be viewed as peripheral decisions and ancillary investments.” While there is generally a consensus at top management level about the benefits of ‘going green’, there are often perceived trade-offs and difficulties at operational levels (Handfield, Sroufe & Walton 2005). This trade-off occurs when operational managers regard the pursuit of ES performance goals to be at the expense of traditional management performance indicators, such as cost, quality and delivery. Handfield et al. (2005, p. 5) noted
“much the same as the trade-off often cited between quality and costs, improved environmental performance and costs are often seen only as in dichotomous, and not symbiotic relationship.”

1.8 The need for a holistic ‘network’ perspective on spread of ES practices

The differences in the use of ES practices between organisations, industries and countries, together with the lack of spread observed in prior research, highlights the significance of the current study’s attempt to understand the spread of ES practices. Prior research suggests using an holistic, integrated approach (Lee 2010), which can be seen in the Global Reporting Initiative’s (GRI) latest G4 sustainability reporting guidelines, which advocate a ‘whole-of-supply chain’ approach to sustainability (GRI 2014). The GRI series 4 guidelines encourage companies to take a broader responsibility towards ES issues, extending beyond company borders, to the supply chains as a whole, encouraging a more holistic approach to ES practices.

The consideration of ES issues has already moved from company level to supply chain level in the green SCM, green supplier development and green purchasing literature (Linton, Klassen & Jayaraman 2007; Zhu, Sarkis & Lai 2008; Vachon & Klassen 2006). The traditional ‘supply chain’ has been extended to include environmental aspects, such as end-of-life processes, recycling and re-use (Pagell & Wu 2009). Another extension across organisational borders is the adoption of a ‘life-cycle perspective’ by some organisations, in which they try to manage their products’ comprehensive ES performance over the products’ life-cycle (Kovacs 2008). Some researchers have included the entire supply chain in their analysis of ES issues (Pagell & Wu 2009), considering forward and reverse supply chains simultaneously (Hulthen & Gadde 2009; Zhu, Sarkis & Lai 2008).

However, a criticism of prior green SCM research is that most studies concentrate on a focal company and its customers or on first-tier suppliers and do not extend the analysis to longer sections of the supply chain (Srivastava 2007). This is important given PUMA’s findings. Another shortfall is that prior SCM studies consider the dyadic relationships only from the customers’ viewpoint, ignoring suppliers’ and other stakeholders’ perspectives (Srivastava 2007; Wagner 2006). Srivastava (2007) called for research into the spread of green SCM best practices and Seuring and
Muller (2008b) echoed this sentiment, suggesting the development of a sustainable supply chain requires many more tiers of suppliers to be included in the analysis, as environmental standards need to be traced back to the first materials used and the processes used to extract them. The current study seeks to fill these gaps.

While SCM offers a step towards a holistic approach in dealing with ES issues, many suggest business issues are best understood when considered at a business network level, in addition to company, buyer-supplier dyad and supply chain levels (Gulati, Nohria & Zaheer 2000; Håkansson et al. 2009; Hulthen & Gadde 2009; Öberg, Huge-Brodin & Björklund 2012; Anderson, Håkansson & Johanson 1994). Gulati et al. (2000) argued a company’s conduct and performance can be better understood by examining the network of relationships in which it is embedded, suggesting a network approach is appropriate for developing a holistic understanding of sustainability and ES issues. For example, Öberg, Huge-Brodin and Bjorklund (2009) warn the contemplation of environmental effects (e.g. pollution or noise) at a company level, rather than at a network level, may lead to decisions that are detrimental to the environment. Indeed, Hulthen and Gadde (2009) recommend a network perspective on supply chains to understand sustainability issues, while Öberg, Huge-Brodin and Björklund (2012) reiterate the need to adopt a network level perspective when assessing environmental impacts. The current study seeks to answer these calls for the use of a network perspective.

A number of ‘network perspectives’ have been developed and reviews of network literature have been conducted (Halinen, Salmi & Havila 1999). A network approach appropriate for the current study is that developed by the Industrial Marketing and Purchasing (IMP) Group (Håkansson et al. 2009; Håkansson & Snehota 1995; Håkansson 1982). A ‘network’ may be viewed as “structures of inter-firm relationships that emerge and evolve through continuous interactive processes” (Halinen & Törnroos 1998, p. 187). The IMP ‘network approach’ provides a holistic approach and allows for the analysis of spread beyond the linear supply chain conceptualisation, by considering the spread of ES practices between directly and indirectly related organisations. Further, it allows for organisations in various positions and roles within the network to be included in the analysis of ES issues, such as green specialist companies, government organisations and industry
representative organisations, in addition to traditional companies. Halinen et al. (1999, p.780) noted the IMP network approach offers conceptual tools for the study of dynamics or change (such as a change in ES practices) and “the importance of both direct and indirect, close and distant relationships for understanding change and allows us to see that relationships may function in various important roles in the generation and transmission of change.”

In particular, the Activity-Resource-Actor (ARA) Model (Håkansson & Snehota 1995) from the IMP network literature is included in the theoretical foundation for the current study as it analyses spread along actor, resource and activity lines. The ARA model simultaneously considers the organisational, dyadic and network levels of analysis that, as already mentioned, are deemed important when considering ES issues (Öberg, Huge-Brodin & Björklund 2009; Öberg, Huge-Brodin & Björklund 2012). The IMP network approach and ARA model are broad and comprehensive enough to capture the ‘network effects’ (Håkansson & Snehota 1995) seen as relevant to the current study. The following section introduces previously suggested conceptualisations of ‘spread’ that are discussed further in Chapter 2.

1.9 Conceptualisations of ‘spread’ of ES practices

Surprisingly, given the potential benefits offered by adopting a holistic network perspective, little IMP research has addressed ES or general sustainability issues (Öberg, Huge-Brodin & Björklund 2012), suggesting a need for the present study. The core network models (such as the Interaction model (Håkansson 1982) and the ARA model (Håkansson & Snehota 1995)) provide building blocks for understanding the spread of generic changes in a network, based on the ‘interaction process’ (Håkansson 1982) and the notions of ‘propagation’ and ‘transmission’ of such changes in the network (Håkansson & Snehota 1995).

There is a significant body of network change or network dynamics research relevant to understanding the spread of ES practices that require changes in the activities of organisations in the network (i.e. the adoption of ES practices) (Chou & Zolkiewski 2012; Anderson et al. 1998; Halinen, Salmi & Havila 1999; Dahlin et al. 2005; Havila & Salmi 2000; Purchase, Lowe & Ellis 2010; Madhavan, Koka & Prescott 1998; Halinen & Törnroos 1998; Halinen, Törnroos & Elo 2013). Much of the
network change literature has focused on changes in network structure (i.e. network positions of organisations and which organisations are in the network) (Madhavan, Koka & Prescott 1998; Halinen, Salmi & Havila 1999; Dahlin et al. 2005; Havila & Salmi 2000), rather than on changes in practices/behaviour (Harilainen 2009), to which the current study seeks to contribute.

The current study seeks to contribute to the network dynamics literature focusing on process (Lowe, Purchase & Ellis 2012; Lowe, Ellis & Purchase 2008; Purchase, Lowe & Ellis 2010; Ellis & Mayer 2001; Chou & Zolkiewski 2012; Halinen, Törnroos & Elo 2013; Buttriss & Wilkinson 2004, 2006; Wilkinson & Young 2012, 2013). Further, the current study aims to assist in closing a gap identified in IMP network research by Wilkinson (2008, p.265), who noted:

“A major gap in understanding business relations and networks is the way they develop and evolve over time, and the role managers and government can play in influencing this in productive ways. This gap exists because most research and theory to date is dominated by comparative-static, variance-based, survey-type approaches to describing and explaining relationship and network behaviour and performance, which ignore temporal processes, including development and evolution, interaction and order effects, and feedback effects.”


While these bodies of research offer relevant insights, they do not specifically address the processes of spread of ES practices in business networks. The current study seeks to fill this void by addressing the research questions and objective outlined subsequently.
1.10 Research questions and objective

The current study seeks to extend the conceptualisations of spread found in IMP network theory, diffusion of innovations, complexity theory and green SCM literature. The study also seeks to contribute empirical data relating to the processes of spread of ES practices. More specifically, the study seeks to address the following research questions and objective:

**Research question:**

*How* and *why* are environmental sustainability practices spread between organisations in business networks?

**Sub-questions:**

1) What are the *processes* involved in the spread of environmental sustainability practices in business networks?
2) What *factors* influence the spread of environmental sustainability practices?
3) How do *characteristics* of environmental sustainability practices affect their spread?

**Research objective:**

To develop an understanding of the spread of environmental sustainability practices in business networks.

1.11 Focus on environmental sustainability

Although theories relating to the change and spread of practices can be applied to many management practices, this study focuses on the spread of ES practices. It is felt ES practices are sufficiently distinct to warrant specific attention. For example, ES practices differ from other management practices aimed at improving cost, quality and delivery in that the economic benefit of the ES practice is often not tangible in the short- (or even long-) term. In this regard, ES practices have similarities with social sustainability practices. However, since the drivers and conditions under which spread occurs may differ between ES and social sustainability practices, this study focuses on ES practices to gain an in-depth understanding of their spread, leaving a similar consideration of the spread of social...
sustainability practices for future research. While the study concentrates on the ES aspect of the ‘sustainability’ triad, the potential trade-offs and interactions with social and economic aspects are considered concurrently to gain a holistic and integrated perspective on ES issues.

1.12 Research process

The methodology used to understand the processes of spread in context is the multiple case study method, within an interpretative research philosophy. The research process is shown in Figure 1.

![Research process in the current study](image)

**Figure 1: Research process in the current study**

To achieve the study’s objective of developing an understanding of the processes of spread of ES practices in business networks (bottom of figure), an abductive (Dubois & Gadde 2002) research approach is used that involves going back and forth (reflected in the triple arrow icon in the middle) between the bodies of literature (shown in the circle on the left) and the data (shown in the circle on the right), until a theoretical saturation point is reached. The study can be described as process
research (Halinen & Törnroos 2005) that uses aspects of narrative sequence analysis (Buttriss & Wilkinson 2004; Buttriss & Wilkinson 2006) and Event-based Network Process Analysis (eNPA) (Halinen, Törnroos & Elo 2013), as shown in the middle circle. The empirical setting in which the case studies were conducted is discussed in the next section.

1.13 The empirical setting

Three case study networks, two in the pork and one in the dairy industry, were investigated within the Western Australian agrifood sector. ‘Agrifood’ includes agriculture production and food processing (Australian Workforce and Productivity Agency 2013). Western Australia (WA) is the largest, in terms of land area, of Australia’s six states and two territories. The State has approximately 2.43m (Australian Bureau of Statistics 2013) inhabitants as at 30 June 2012 (representing about 11 percent of the total Australian population). The WA agrifood sector represents around 10 per cent of the State’s economy (DAFWA 2014c) and its key industries include sheep, grains, pork, beef, dairy, horticulture, pastoral, poultry and food processing (England et al. 2009).

Most agricultural production (80%) is exported and agriculture is WA’s second major export industry, after mining (DAFWA 2014c). In 2012/2013, WA exported about A$6 billion in agriculture and food products; an increase of 18% on 2011/2012 (DAFWA 2014c). Over the last decade, about 70% of WA’s agrifood exports have been to Asia, particularly to China, Japan and Indonesia (DAFWA 2014c).

The WA food processing industry makes up 14% of WA’s total manufacturing (DAFWA 2009). The industry is very concentrated, with 38% of total processing turnover attributable to 1% of WA food processing companies (DAFWA 2009). There are approximately 900 food processing companies in WA, with a labour force of about 19,500, although the number of food processors has decreased over time as processors have been bought up by large global food supply chains (DAFWA 2009).

The spread of ES practices is important to the WA agrifood sector for a number of reasons. Firstly, the WA (and Australian) agrifood sector enjoys a ‘clean and green’ reputation (DAFWA 2009) and uses this status as a comparative advantage when exporting. The WA agrifood sector “is well placed to offer premium products that
are sustainably and ethically produced, of known provenance and exceptional quality” (DAFWA 2014c, p. 1). This ‘clean and green’ marketing edge is important, as Australia cannot generally compete on price due to the high Australian dollar and high cost of labour. An understanding of the processes of spread of ES practices will, thus, assist the sector in maintaining this reputation.

Secondly, ES practices, such as farming practices, are integral to the agrifood business sector, making the spread of ES practices very relevant. The agrifood sector has many potential impacts on the environment, such as waste disposal, soil and water damage, deforestation, global warming from methane, impacts from the use of chemicals (e.g. fertilisers, herbicides, pesticides) and the consequences of farming techniques (Maloni & Brown 2006). Thirdly, there have been a number of government projects implemented to encourage the spread of ES practices in the sector, such as the “Plan to support Food Industry Development 2009-2012” and “Farming for the Future” (DAFWA 2009), suggesting Government consider ES practices to be important in this sector. Understanding such projects from multiple perspectives can assist in the planning of future government projects.

From a theoretical perspective the WA agrifood sector is an appropriate setting for the current study as:

1) It has suitably long supply chains to enable longer sections of the supply chain to be studied.

2) It has organisational variety, which allows the role of organisations in various network positions to be investigated (such as farmers, industry organisations, governmental organisations, food processors and retailers).

3) The presence of government projects allows for an understanding of the processes of spread instigated by government departments.

1.14 Contributions of the study

It is hoped the current study will contribute to the conceptualisation and methodology concerning the study of processes in business networks, as well as the literature concerning network dynamics and change. The study provides a holistic categorisation of the processes of spread of ES practices in business networks, the factors influencing spread and characteristics of ES practices affecting their spread,
consolidating prior disaggregated literature that addresses different aspects of these topics. The study offers a focused, cross-country comparison of the sustainability reports of large supermarkets in Australia, the UK and the USA, not previously provided. Also, the study illustrates an event-based approach to process research, based on aspects of Event-based Network Process Analysis (eNPA) (Halinen, Törnroos & Elo 2013) and narrative sequence analysis (Buttriss & Wilkinson 2004; Buttriss & Wilkinson 2006).

At a theoretical level, the study extends the conceptualisation of ‘process’ in business networks by providing an expanded definition of ‘process’ and submitting the idea of ‘cascading processes’ where higher level processes in business networks arise from multiple, interacting sub-processes and each sub-process emerges from further multiple, interacting processes, in an iterative progression. The study contributes to the concept of ‘levels’ in the study of processes (Makkonen, Aarikka-Stenroos & Olkkonen 2012; Halinen, Törnroos & Elo 2013; Buttriss & Wilkinson 2004) and its influence on network change. The study proposes that the spread of ES practices can be analysed at multiple levels of aggregation, such as international, national, state, industry, supply chain, dyad and organisational levels, resonating with the levels of recursive organisation advocated by Espinosa and Walker (2011) when applying complexity theory to sustainability.

Contributions are also made to the conceptualisation of ‘issue-based nets’ in the sparse prior research into issue-based nets (Ritvala & Salmi 2010; Brito 1999; Möller, Rajala & Svahn 2005). The formation of issue-based nets is identified as one of the processes involved in the spread of ES practices and empirical data is provided relating to the formation, operation, preceding and proceeding processes, as well as proposed success factors for the formation and operation of issue-based nets. Issue-based nets help us to deal with the ‘borderless’ properties of many ES practices that lead to the market failure problems associated with ‘public goods’. In practical terms, the study was designed to assist stakeholders, such as governments and brand owners, to understand the options and challenges in attempting to spread ES practices. These contributions are discussed in more detail in Chapter 6.
1.15 The structure of the remaining Chapters

Chapter 2 provides a review of prior literature relevant to the spread of ES practices. Chapter 3 discusses the methodology used, while Chapter 4 presents a ten year review of the large Australian supermarkets (Coles and Woolworths) and comparative UK and USA supermarkets. Chapter 5 presents the results and analysis of the three case studies in the Western Australia pork and dairy industries. The results are discussed in Chapter 6 leading to a discussion of the contributions of the study. Finally, Chapter 7 concludes by summarising the study’s contribution to knowledge, as well as its potential managerial and policy implications. The strengths and limitations of the study are outlined and suggestions for further research are discussed.
CHAPTER 2 - LITERATURE REVIEW

2.1 Introduction

The literature review begins with an overview of the theoretical foundation for the study, namely the IMP network approach, with particular focus on the ARA model (Håkansson & Snehota 1995). Thereafter the conceptualisations of ‘spread’ of practices are discussed emanating from the IMP network, complexity theory, diffusion of innovations and supply chain management literature. Note that the focus of the literature review is on the IMP business network literature, while the other subsidiary reviews provide additional ways of considering ‘spread’. The scientific literature relating to sustainability, such as the scientific effectiveness of various sustainability practices, is deemed beyond the scope of this study and is not included in the review. The following section provides a brief outline of the IMP network approach.

2.2 Brief overview of the IMP network approach – theoretical foundation

The IMP group was formed in 1976 composed of researchers from five European countries (Håkansson et al. 2009). The IMP research tradition is mainly empirically based, predominantly using case studies and in-depth interviews (Halinen & Törnroos 2005) to understand business relationships. While the original empirical studies were carried out in Europe, Håkansson et al. (2009) suggest that similar empirical findings were found in the USA, Asia and Australia. A core, well-established model emanating from the IMP network literature, which is employed in the current study, is the Activity-Resource-Actor (ARA) model (Håkansson & Snehota 1995). The ARA model builds on the Interaction model (Håkansson 1982) to understand business relationships.

2.2.1 Interaction model

The Interaction model emerged from a large-scale comparative study of industrial marketing and purchasing across Europe (Håkansson 1982). The empirical findings challenged the economic ideas at the time which focused on discrete purchases, markets as generalised and passive and industrial markets as atomistic in structure (Håkansson 1982). Rather, the findings led to the conceptualisation of the
‘interaction approach’ to understanding business relationships, which places importance on understanding the interactions between active buyers and sellers in long-term, collaborative business relationships, and not only on companies in isolation. The main elements of the Interaction model are shown in Figure 2.

![Figure 2: Main elements of the Interaction model (Håkansson 1982, p. 22)](image)

In Figure 2, the buyer-supplier dyad is depicted as bounded within a relationship’s ‘atmosphere’, which in turn is included in the broader ‘environment’ (both representing the context of the relationship). The ‘atmosphere’ within which organisations interact incorporates issues such as the power-dependence relationship between the organisations, whether there is conflict and/or co-operation and the overall closeness or distance of the relationship, together with the organisations’ mutual expectations (Håkansson 1982). The ‘environment’ in which the dyadic relationship sits refers to the vertical and horizontal market structure in which the relationship occurs and reflects the general social influences impacting on the relationship. The Interaction model reflects relationships between organisations comprised of elements and processes of interaction, which may be short-term episodes between the organisations or long-term relationships.

The relevance of the Interaction model to the current study is that it is a building block for the ARA model. Also, the Interaction model focuses on the process of interaction between organisations which is important in the current study which is
interested in understanding the processes of spread between organisations. Further, the Interaction model places importance on the context in which interactions between organisations occur, which is important since the current study is concerned with the factors and context influencing the processes of spread between organisations.

### 2.2.2 ARA model

The ARA model (Håkansson & Snehota 1995; Anderson, Håkansson & Johanson 1994) extends the Interaction model by recognising that organisations in dyads are connected directly and indirectly to other organisations making up a network of organisations. Figure 3 depicts a business network of organisations (represented by nodes) connected directly and indirectly by relationships (represented by threads).

![Business relationships as elements of a network structure](image)

**Figure 3: Business relationships as elements of a network structure**

(Håkansson & Snehota 1995, p. 19)

An important contribution of the ‘network approach’ is the recognition of the interdependence and connectedness of relationships (Håkansson & Snehota 1995). These characteristics imply that interactions within a single business relationship effects and is affected by, directly and indirectly, interactions in other business relationships. Multiple ‘network effects’ can emerge where actions by an actor lead to reactions by other actors, which lead to further reactions to reactions and so forth (Håkansson & Snehota 1995). These ‘network effects’ are often unpredictable (Håkansson & Ford 2002), implying that managers can merely seek to manage within networks rather than manage networks (Håkansson & Ford 2002; Håkansson et al. 2009). The
network approach also emphasises the concept of embeddedness of organisations in a network, which is discussed later.

The network approach and presence of network effects highlight that organisations and relationships should not be analysed in isolation, but need to be understood within their network context. Recognising these complexities, the ARA model provides a conceptual framework for the process and outcomes of interaction (Håkansson et al. 2009) summarised in the *ARA scheme of analysis* (Håkansson & Snehota 1995) shown in Figure 4.

<table>
<thead>
<tr>
<th>Activities (Row 1)</th>
<th>Company (Column 1)</th>
<th>Relationship (Column 2)</th>
<th>Network / third parties (Column 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Activity structure</td>
<td>Activity links</td>
<td>Activity pattern</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actors (Row 2)</td>
<td>Organisational structure</td>
<td>Actor bonds</td>
<td>Web of actors</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resources (Row 3)</td>
<td>Resource collection</td>
<td>Resource ties</td>
<td>Resource constellation</td>
</tr>
</tbody>
</table>

**Figure 4: ARA Scheme of analysis of development effects of business relationships (Håkansson & Snehota 1995, p. 45)**

Fundamental to the ARA scheme of analysis is the view that business relationships are made up of three layers, namely activity links, resource ties and actor bonds (Håkansson & Snehota 1995). Figure 4 shows that business relationships can be analysed at the company, dyadic and network levels (columns 1, 2 and 3) in terms of activities, actors and resources (rows 1, 2 and 3). Column 1 reflects how an organisation can be analysed in terms of its activity structure, organisational (actor) structure and resource collection. Similarly, column 2 shows that within a relationship organisations interact regarding activities, forming activity links; actors interact, forming actor bonds; and organisations can interact regarding resources,
forming resources ties. Column 3 represents the network level showing that collectively, the activities within and between various organisations in a network develop into an activity pattern in the network; the relationship between actors within and between organisations in a network form a web of actors at the network level; and the resources of each organisation, together with how resources are used in relationships form a resource constellation. The bi-directional arrows in the ARA scheme of analysis show the interdependent and dual effects of what happens at the company, dyad and network levels (columns 1, 2 and 3), and the interrelationships between activities, actors and resources (rows 1, 2 and 3), within a company, relationship and network, respectively. Further, focusing on each row, it can be seen how a company’s activities (row 1, column 1) are affected and effect activities in its relationships (row 1, column 2) and in the network as a whole (row 1, column 3). A similar explanation applies to the actor (row 2) and resource (row 3) rows in the scheme of analysis. The ARA scheme of analysis thus offers a holistic framework to develop an understanding of business interactions.

The current study uses the concepts in the ARA scheme of analysis as a holistic and comprehensive framework for developing an understanding of the processes of spread of ES practices. Please note that ‘ES practices’ as contemplated in the current study can be called ES activities, in the ARA model terminology. The ARA scheme of analysis is applicable to the current study since it focuses attention on the activities (practices), actors and resources involved with ES, at the company, relationship and network levels, respectively. Further, the ARA scheme of analysis provides a framework for analysing how the ES activities, actors and resources are interconnected at the company, relationship and network levels of analysis. The current study will consider all three layers (activities, resources and actors) in the ARA scheme of analysis, yet the principal focus will be on the activity layer. For this reason, the 4R model (Håkansson & Waluszewski 2002a), which focuses in detail on the resource layer, will not be employed in this study.

2.3 Reasons for choosing the IMP network approach as the theoretical foundation

When contemplating the objective of this study which is to develop an understanding of the spread of ES practices in business networks, a number of bodies of literature

While SCM offers insights into the processes of spread along supply chains, it does not offer a framework to actively include the role of other organisations and supply chains in the analysis (Seuring & Muller 2008b; Vachon & Klassen 2006). The diffusion of innovations (DOI) literature (Rogers 1962; Rogers 2003), while contributing useful insights on ‘spread’ which are utilised in the current study, is considered to be too uni-directional (Makkonen 2011) since it contemplates diffusion to social units, rather than focusing in detail on the interactions between (Håkansson 1982) the organisations as diffusion occurs (Easton & Håkansson 1996), which is a focus of the current study. Further, the DOI literature tends to focus on individuals, rather than organisations, although there have been DOI studies focusing on organisations, such as Greenhalgh, Robert, Macfarlane, Bate and Kyriakidou (2004) who provide an extensive literature review and propose a model for considering the diffusion of innovations in health service organisations (Rogers 2003).

The complexity theory approach (Jones 2011; Espinosa & Walker 2011) appears relevant and useful to the research objective, but there is not as yet a strong body of empirical studies relating to its application to organisations to rely on. Also, complexity theory has been incorporated into the IMP network approach by some researchers (Wilkinson & Young 2013; Held 2010). Therefore, complexity insights are available when using the chosen IMP approach as the theoretical foundation.

The IMP network approach affords a holistic perspective by incorporating all the organisations which may play a role in the spread of ES practices, such as government organisations, industry organisations, green specialist companies, not-for-profit and for-profit companies. The network can be as extensive (wide) as
required to capture patterns of spread between the organisations in various network positions. The network approach is multi-directional, focusing on interactions between organisations, which allows for a comprehensive understanding of the interactive processes of spread of ES practices. Further, the network approach acknowledges the importance of context (Håkansson 1982; Håkansson & Snehota 1995; Halinen & Törnroos 1998), which is crucial for understanding the factors influencing spread.

In addition, the network approach recognises the interdependence, connectedness and multiple ‘network effects’ which characterise networks (Håkansson 1982; Håkansson & Snehota 1995; Halinen, Törnroos & Elo 2013). These concepts are important in understanding the spread of ES practices since it is likely that multiple organisations in a network will be engaging in various processes and activities related to ES, which may create multiple network effects due to the connectedness between the various network actors; the network approach embraces this complexity.

Finally, the IMP network approach has a history of case study and in-depth interview methodology (Halinen & Törnroos 2005), which is deemed most suitable for the current study since the purpose is to understand the processes of spread of ES practices in context (Yin 2009; Eisenhardt 1989).

Comparing the IMP network approach to other network approaches (Halinen & Törnroos 1998), such as social network theory (Scott 1991), the IMP approach was deemed suitable since the focus is on organisations, as opposed to individuals as in the social network approach. Since ES is part of the sustainability triad, some sustainability theories were also considered, such as stakeholder theory, attributed to Freeman (Stieb 2009; Freeman 1984). However, while stakeholder theory allows for the perspectives of the multiple stakeholders in the study, it does not offer the opportunity to study the processes of spread and the patterns of spread across multiple organisations, as does the IMP network approach (Halinen, Törnroos & Elo 2013).

Based on the above reasoning, the theoretical foundation for the current study is the IMP network approach. The following sections discuss the conceptualisations of spread emanating from the (1) IMP network, (2) diffusion of innovations, (3) complexity theory and (4) SCM literature.
2.4 IMP network literature conceptualisations of ‘spread’

‘Spread’ was defined for the purpose of the current study in section 1.4. ‘Spread’ is not a defined IMP term, hence the research objective and questions in the current study need to be carefully positioned so as to identify the relevant streams of IMP network literature. As mentioned in section 1.4 the term ‘spread’ can be viewed as equivalent to the IMP network terms ‘propagation’ and ‘transmission’ used in the ARA model in the context of changes being ‘transmitted’ or ‘propagated’ to various parts of a network (Håkansson & Snehota 1995, p. 20).

Building on these fundamental notions of spread (propagation) from the core IMP models, there is a significant body of IMP literature (Chou & Zolkiewski 2012; Anderson et al. 1998; Halinen, Salmi & Havila 1999; Dahlin et al. 2005; Havila & Salmi 2000; Purchase, Lowe & Ellis 2010; Madhavan, Koka & Prescott 1998; Halinen & Törnroos 1998; Halinen, Törnroos & Elo 2013; Harilainen 2009; Buttriss & Wilkinson 2014; Vaaland, Purchase & Olaru 2005) focusing on network change, network evolution and network dynamics, deemed relevant since the current study is concerned with the processes resulting in changes in the ES practices of organisations in a network. The terms ‘network change’, ‘network evolution’ and ‘network dynamics’ broadly refer to changes in networks and may be regarded as largely synonymous; for example network dynamics “simply connote “changes” in networks” (Chou & Zolkiewski 2012, p. 248) i.e. network change. Hence the term ‘network change’ will incorporate all three terms in the current study.

It is noted that ‘spread’ does not mean a set of various changes occurring in a network; spread in the current study implies similar (yet not identical) changes in practices/activities occurring in various parts of a network, as explained in section 1.4. Thus, spread refers to recurrent changes i.e. similar changes (adoption of various ES practices) occurring over and over again in various organisations in the network. In this way ‘spread’ may be viewed as linked to a sub-set of network ‘change’ i.e. change of a recurrent nature. Thus, insights regarding ‘spread’ are gained from the network change literature, while bearing in mind that ‘spread’ represents a sub-set of the network change concept.
‘Spread’ may be analysed as a ‘process’. There is an increasing focus in the IMP literature on the process aspect of network change (Lowe, Purchase & Ellis 2012; Lowe, Ellis & Purchase 2008; Purchase, Lowe & Ellis 2010; Ellis & Mayer 2001; Chou & Zolkiewski 2012; Halinen, Törnroos & Elo 2013; Buttriss & Wilkinson 2004, 2006, 2014; Wilkinson & Young 2012, 2013; Elo, Halinen & Törnroos 2010; Tidström & Hagberg-Andersson 2012; Held et al. 2014), more recently with the assistance of complex systems thinking and agent-based models (Prenkert & Følgesvold 2014; Held et al. 2014; Olaru & Purchase 2014). The IMP literature focusing on process is included in the literature review as well as in the methodology Chapter. Also included in the literature review are the limited, yet growing, IMP studies addressing sustainability issues. Please note that the combined IMP and diffusion of innovations (DOI) and combined IMP and complexity theory literature is discussed in sections 2.5.2 and 2.6.3 respectively.

2.4.1 IMP conceptualisations of network change

2.4.1.1 Interaction process

At the most fundamental level, IMP network theory contemplates changes occurring in networks though the process of interactions between organisations (Håkansson & Snehota 1995; Ford & Håkansson 2006; Ford et al. 2010; Waluszewski et al. 2008). Interactions are regarded as a multi-dimensional process between organisations that change and transform aspects of the resources and activities of those organisations, as well as the organisations (actors) themselves (Håkansson et al. 2009). Changes in activities, resources and actors occur when organisations (actors) choose to make adaptations towards each other when developing relationships, where such adaptations may be one-off occurrences or smaller successive steps over time (Håkansson et al. 2009).

2.4.1.2 Causes of change - triggers

IMP network theory envisages changes in business networks to be caused by a multitude of factors and events, denoted by various names in the literature, such as exogenous and endogenous factors (Håkansson & Snehota 1995), triggers (Hertz 1999; Dahlin et al. 2005) and critical events (Havila & Salmi 2000). Actors in the network may adapt/react to these exogenous and endogenous factors/events and
initiate changes in their relationships (through the interactive process) (Håkansson & Snehota 1995), which may be transmitted further in the network as explained in the following section.

2.4.1.3 Propagation/transmission of change beyond the initial dyad

Changes within a dyad may be transmitted further in the network if counterparts to the actors in the initial relationship react to these changes (Håkansson & Snehota 1995) i.e. when the interactions within a dyad affect each organisation’s interactions with other connected organisations (Håkansson et al. 2009). This process may repeat itself multiple times, thus transmitting the change to extensive parts of the network.

To summarise, at the most fundamental level, Håkansson and Snehota (1995) describe the sequence of events giving rise to network change as follows: 1) an endogenous or exogenous factor will create a new condition, 2) actors may react to this change in conditions and initiate changes in their relationships, 3) counterparties in relationships may also react, and 4) the changes may be spread to other connected relationships as they too react and counter-react, etc.

2.4.1.4 Role of dyadic relationships in network change

IMP network literature highlights dyadic relationships as both a source of change and recipient of change in networks (Håkansson & Snehota 1995). This is reiterated in the network change literature focusing on changes in structure (where structure refers to which actors are in the network and their network positions) (Madhavan, Koka & Prescott 1998; Halinen, Salmi & Havila 1999; Havila & Salmi 2000). For example, Halinen et al. (1999) emphasised the central role of business relationships, i.e. dyads, and their role as generators, recipients and transmitters of structural change in networks, contending that the role of a dyad in network change is threefold: “it generates change by itself, but also functions as a recipient and a transmitter of change with respect to other relationships in the network” (1999, p. 784). They explain that while environmental forces have a general impact on networks, they are transmitted within the network through individual relationships. They regard the forces behind network dynamics to be inertia and critical events. Havila and Salmi (2000) investigate how critical events may give rise to radical structural change, concluding that while overall conditions seem to have a general
impact on networks, changes are always transmitted within the network through *individual relationships*, reiterating the significance of dyadic relationships in network change.

### 2.4.1.5 Role of nets in network change

In addition to the contemplation of spread through *dyadic* interactions, business network literature has investigated changes brought about through the mobilisation of *groups* of actors, called ‘nets’. Brito (1999) differentiates between the ‘network’ which refers to the overall network of relations in a particular industry and the term ‘net’ referring to a sub-set of the overall network.

Ritvala and Salmi (2011) define mobilisation as:

> “a dynamic process of engaging actors on broad fronts to tackle a common issue” (p.887).

Mobilisation is similar to ‘collective action’ defined as:

> “Group's steps or actions while working toward a common goal” (The Law Dictionary 2014, p. 1).

Given that ES is a borderless concept affecting numerous actors and requiring participation by numerous actors to achieve ES objectives, many researchers are recognising the potential for collective action and mobilisation to address environmental issues (Ostrom 2009; Ritvala & Salmi 2010, 2011; Patala et al. 2014; Ryan, Kajzer & Daskou 2012).

Mobilisation of nets has been considered in the ‘issue-based net’ literature addressing both *business* issues (Araujo & Brito 1998; Brito 1999, 2001) and *ES* issues (Ritvala & Salmi 2010, 2011). The mobilisation of nets to achieve *business* objectives has also been considered in the *strategic net* literature (Möller & Rajala 2007; Möller & Svahn 2003; Möller & Halinen 1999; Aarikka-Stenroos, Sandberg & Lehtimäki 2014). Ritvala and Salmi (2010) comment that network mobilisation (Mouzas & Naudé 2007) research has traditionally focused on business issues, rather than societal issues such as ES, and that there is scarce research concerning mobilisation of networks outside the business context.
The contemplation of the formation and operation of the nets brings to the fore the business network debate around the *management* and *manageability* of networks. The debate centres on whether an individual actor (referred to as a central network agent or ‘hub’) can develop, manage and control networks and/or whether networks are emergent, arising from multiple dyadic interactions thus making them unmanageable by any one actor (Ford et al. 2002; Håkansson & Ford 2002; Möller & Halinen 1999; Ritter, Wilkinson & Johnston 2004).

Some key researchers in the IMP tradition (e.g. Håkansson & Ford 2002; Håkansson & Snehota 1995; Wilkinson & Young 2013) support the latter view and emphasise the historical, evolutionary and embedded properties of business networks where networks are viewed as borderless, self-organising systems that emerge in a bottom-up process from interactions and no single organisation can manage the network (Möller & Rajala 2007). In contrast, the former view, arising from the strategic management and resource based perspectives, contemplates intentionally created ‘strategic networks’ comprised of specific groups of organisations with agreed roles and often needing to be ‘managed’ by a single organisation to be efficient (Möller & Rajala 2007).

Möller and Rajala (2007) contend that *both* network views are relevant in understanding the behaviour of organisations and management in network contexts. They point out that the ‘emergent’ network view includes intentional actions by the actors that construct them. The literature does not clarify the connections between the various nets, such as whether issue-based nets are also strategic nets and vice versa. These questions will be considered in the following review of literature concerning strategic nets and issue-based nets.

**Strategic nets**

‘Strategic nets’ refer to *intentionally created* business networks such as supplier nets, distribution nets and R&D (research and development) nets (Möller & Rajala 2007; Möller & Svahn 2003; Möller & Halinen 1999; Aarikka-Stenroos, Sandberg & Lehtimäki 2014; Paquin & Howard-Grenville 2013). Strategic nets have a finite number of actors; at least three (Möller, Rajala & Svahn 2005). Strategic nets may be intentionally ‘orchestrated’ by an actor who recruits network members and influences their interactions (Paquin & Howard-Grenville 2013).
Möller et al. (2005) distinguish various types of strategic nets: 1) vertical value nets (e.g. supplier nets, channel and customer nets), 2) horizontal value nets (competition alliances; resource / capability access alliances; resource and capability development alliances) and 3) multidimensional value nets (e.g. core or hollow organizations, complex business nets and new value-system nets). The horizontal value nets can involve cooperative arrangements among various institutional actors (e.g. government agencies, industry associations, research institutes and universities) that aim either to provide access to existing resources or to jointly develop new resources.

**Issue-based nets**

Issue-based nets have been defined as follows:

“An issue-based net constitutes a form of temporary association based on cooperative relationships among actors aiming to influence through collective action(s) the constitutional ordering of the network in which they are embedded in relation to a specific issue” (Araujo & Brito 1998, p. 29).

“An issue-based net can be defined as a net of relationships among actors who are concerned with a particular issue through mutual or conflicting interests” (Brito 1999, p. 92).

“An issue-based net constitutes a form of association mainly based on cooperative relationships amongst actors who aim to cope with a collectively recognised issue by influencing the structure and evolution of the system(s) to which they belong through an increased control over activities, resources and/or other actors” (Brito 1999, p. 92).

An issue-based net is a sub-set of an *issue network* which is defined as “a loose, temporary coalition of diverse types of actors that emerges around a common issue to influence existing beliefs and practices through network relations” (Ritvala & Salmi 2010, p. 898).

From the above definitions and extant literature, key features of issue-based nets include: 1) they are a sub-set of the network (net), 2) they centre on a collective (Brito 1999) or common (Ritvala & Salmi 2010) issue, 3) the members may have
differing resources, 4) they are open to others who wish to join, 5) they are often temporary, 6) members may include diverse types of actors (e.g. companies, not-for-profit organisations, government agencies), and 7) they are often based on cooperative relationships, yet 8) the members may have mutual or conflicting interests regarding the ‘issue’. An ‘issue’ is considered to be “a development, event, or trend perceived as potentially having an impact on the organisation” (Ritvala & Salmi 2011).

Brito (1999) differentiated between formalised issue-based nets (such as trade associations, farmer cooperatives, trade unions, consortia of companies for joint sourcing) and non-formalised or virtual issue-based nets (such as informal pressure groups of customers or suppliers). Virtual issue-based nets are often initially mobilised by an inner circle of resourceful and interested actors (Brito 1999). Brito (1999) argued that virtual issue-based nets may play a central role in the dynamics of industrial networks and may represent a mobilisation of interests beyond institutionally represented groups of interests. He suggests that virtual issue-based nets are likely to influence the processes, the structure of relationships, and therefore the balance of power within industrial networks.

**Examples of issue-based nets**

Araujo and Brito (1998) investigated issue-based nets in the port wine industry in Portugal centring on the business issue of excess stock. The issue-based net was initiated by the port wine shippers and through their industry association they conducted negotiations with farmers and the Portuguese government. The agreement involving the Port Wine Shippers’ Association, the farmers’ representative organisation, the Port Wine Institute and four institutionalised actors was interpreted as the visible aspect of a virtual, issue-based net. The issue-based net initially emerged among a group of shippers (within the formal shippers’ representative organisation) and was later extended to include other actors (e.g. farmers and government) who were mobilised into the collective action. Araujo and Brito (1998) suggested that collective actions depend on convergent interests but also provide opportunities for bargaining processes where interests diverge among members. Their case study showed the political dimension of collective action where collective action is used to change the power structures in the overall network. Apart from
using collective action to solve the issue of excess stock, the case showed how collective action progressed power struggles between shippers and distributors and the shippers and the farmers’ representative body. The case study demonstrated how a core group of actors mobilised the formation of the issue-based net and how the interests of the collective action changed over time.

Ritvala and Salmi (2010, 2011) have investigated the use of issue-based nets formed to address environmental problems relating to the Baltic Sea. The issue-based nets studied include a WWF (World Wildlife Fund) Finland initiative (a culmination of WWF’s protection work of the Baltic Sea that started in the early 1970s), the work carried out by a private foundation, the organising of the Baltic Sea Action Summit in Helsinki in February 2010 by the Baltic Sea Action Group, and the Baltic Sea Challenge campaign launched by the cities of Helsinki and Turku in Finland. The 2010 study focused on the network mobilisers and mobilisation mechanisms. They identified influential and motivated initiating individuals referred to as ‘modern environmental networkers’ who were often non-governmental organisations. The study highlighted the personal commitment and face giving by network mobilisers, the relationship sediments between network mobilisers and target organisations and that the mobilisers used shared values to mobilise people with different backgrounds to act positively for a common concern. Their model of network mobilisation identified network mobilisers, enabling factors (social factors, business benefits, political will and shared values and moral responsibility) and target organisations.

Ritvala and Salmi’s 2011 study focused on the target organisations of issue-based net mobilisation to understand why and how companies may be activated to participate in common efforts. They investigated the connectedness between stakeholders and argued that mobilising diverse actors around an issue necessitates network centrality, which refers to an actor's position in a network relative to others. The key motivations for target organisations to participate in issue-based nets were found to be 1) image based and revenue based mobilisation, 2) values based mobilisation (including motivational impacts on staff), 3) receptive individuals and organisations (i.e. people with enough power in an organisation to commit the organisation), 4) issue framing (i.e. how the issue is presented to the target organisation) and 5) wider network pictures (i.e. companies may participate because they perceive it as a way to
reach wider networks). They proposed a model for mobilisation with the following phases: 1) the time prior to the mobilisation efforts when a severe issue starts to emerge, 2) some actors (e.g. environmental networkers) start acting on the issue and mobilising issue stakeholders, and 3) target organisations join in the issue-based networks. Ritvala and Salmi (2011) found that values were more important in understanding the network mobilisers behaviour while business aspects (image based and revenue based mobilisation) were more important in understanding the participation of target organisations.

**Issue-based nets versus strategic nets**

The literature is not clear on the differences (if any) between strategic nets and issue-based nets. Since a ‘strategic net’ is defined as an *intentionally created* net (Möller, Rajala & Svahn 2005), a relevant question is whether issue-based nets are always formed intentionally. Table 1 provides a comparison of issue-based and strategic nets.

Table 1: Comparison of issue-based and strategic nets

<table>
<thead>
<tr>
<th></th>
<th>Issue-based nets</th>
<th>Strategic nets</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Formation</strong></td>
<td>The recognition of the issue may emerge from multiple interactions. Thereafter, the net is usually mobilised by a small number of motivated and influential actors, after which the net again shows emergent properties as it develops (Araujo &amp; Brito 1998; Brito 2001).</td>
<td>Strategic nets are often mobilised by a hub company with influence over the net. The net members are orchestrated and intentionally chosen, based on strategic business objectives (Paquin &amp; Howard-Grenville 2013).</td>
</tr>
<tr>
<td><strong>Membership</strong></td>
<td>The net is open to new members who may have common or conflicting interests in the issue and diverse resources (Brito 1999).</td>
<td>Usually the members of the net are intentionally targeted by the hub company and the net is exclusive to others (Möller, Rajala &amp; Svahn 2005).</td>
</tr>
</tbody>
</table>
The net is centred on a particular issue which is common and collective (Araujo & Brito 1998) which may relate to business (e.g. excess stock of port wine) or society (e.g. the sustainability of the Baltic Sea).

The net is often centred on the objectives of the hub company (Paquin & Howard-Grenville 2013). Literature has only focused on strategic business objectives.

The net is often mobilised by a core inner group. All interested members may participate and bring diverse resources (Brito 2001).

All members are chosen strategically, based on their resources (Paquin & Howard-Grenville 2013).

Interactions are based on collaboration and bargaining (Araujo & Brito 1998). The inner core actors have strong relationships while the other actors may be linked by weak ties.

The net is often coordinated by the hub (Möller, Rajala & Svahn 2005).

Power is often shared and may rest with the inner core that mobilised the net.

Power may rest with the hub company.

The net as a whole often benefits.

The hub may reap more benefits than the other members.

The net is usually temporary and based on the life-cycle of the issue (Ritvala & Salmi 2010).

The net may be short- or long-term depending on the objectives of the hub company (Möller, Rajala & Svahn 2005).

Table 1 shows that certain nets may be both ‘issue-nets’ and ‘strategic nets’ as defined. However, not all issue-nets are strategic nets and vice versa. A key difference is that the issue-based net is not always intentionally created to include particular members but may emerge from interactions by actors grappling with a common issue. Also, issue-based nets are often mobilised by small groups of actors while strategic nets are often mobilised by a single actor. Further, issue-based nets are open to further members with diverse resources, while a strategic net membership
is determined by the hub and is based on specific resources to be provided by each member. Thus, the issue-based nets have no explicit boundary, whereas the strategic nets have an explicit boundary.

Issue-based nets are discussed in relation to both business and societal issues, whereas strategic nets address business goals, often relating to the hub. Both issue-based and strategic nets may be short- or long-term, but issue-based nets are often temporary. It is submitted that a further difference between issue-based and strategic nets is scale – issue-based nets describe the mobilisation that occurs where the issue or objective pursued is a large scale problem, which is difficult to solve by a single or small group of actors. In contrast, strategic nets relate to a smaller scale, where the goal is potentially solvable by a small group of actors.

In conclusion, it is submitted that a net may be both a strategic and an issue-based net or may be just an issue-based net that emerges (thus not a strategic net). Further, it is submitted that a net may be a strategic net which is not an issue-based net since strategic nets may form around a set of business goals (perhaps the hub’s business goal) and not a more ‘collective’ issue, as envisaged in the issue-based net literature. However, whether all strategic nets are or are not issue-based nets and vice versa does not detract from the lessons that the net mobilisation literature offers to the processes of spread of ES, as contemplated in the current study. Further, since ES is a large scale and borderless issue, the issue-based net literature is considered more relevant to the objectives of the current study than the strategic net literature.

2.4.1.6 Role of actors

The role of actors in bringing about changes in the network is emphasised in the IMP literature. Håkansson et al. (2009, p. 132) suggest that “[w]ithout actors, business networks would not be dynamic” and that actors are the main organising force in business networks. Although most IMP literature is concerned with networks of companies, the extant literature recognises the roles of other types of actors such as not-for-profit companies, government agencies and industry organisations that form part of business networks (Wilkinson 2008; Welch & Wilkinson 2004). Wilkinson (2008, p. 222) contends that policymakers “are not outside the systems they regulate, monitor and control; they are part of the business system” and should not be regarded
as part of the environment. Wilkinson (2008) regards policymakers as the political actors in business networks who influence the network and in turn are influenced by it. The roles of all actors relevant to the processes of spread of ES practices will be considered in the current study. Since the focus of the current study is on changes in activities (ES practices), changes particular to the activity layer are discussed in the following section.

### 2.4.1.7 Network changes in the activity layer

IMP network theory contemplates changes in activity chains and activity patterns to be a consequence of adaptations in activity links undertaken by pairs of companies (Håkansson & Snehota 1995). Changes in activities within a relationship may propagate both vertically along the activity chain and horizontally (Håkansson & Snehota 1995). Håkansson et al. (2009) contend that questions surrounding what, who and how activities will be carried out cannot be made by companies in isolation, but rather through interactions between companies.

There is limited IMP literature focusing on the spread of management practices, an exception being Harilainen’s (2009) conceptual framework of the spread of CSR-related practices towards suppliers in a supplier network. The spread of practices is described as follows. A trigger event initially affects a single buyer-supplier dyad which triggers the creation of new practices within the dyad, most likely initiated by the buyer side or brand owner. An example of a trigger for a new CSR-related practice could be a CSR misconduct event that has received significant media attention. Next, the practices may be adopted in directly connected dyads, such as the supplier’s supplier and the buyer’s other suppliers. Finally, the new practices may be adopted by indirectly connected buyer-supplier dyads in the network if the trigger is strong enough and if the propagating company has the necessary skills and resources to propagate the practice. Thus, Harilainen’s conceptual framework incorporates the general explanation of changes in a network per the core IMP network models (see section 2.4.1.3), but adapts it to the spread of CSR practices in particular. Harilainen calls for empirical work to further develop this conceptual framework and for further IMP network research incorporating CSR, which the current study seeks to provide.
2.4.1.8 Extent of the spread of changes

Many IMP studies have described the various degrees or extent of transmission of network change. For example, Halinen, Salmi and Havila (1999) in their analytical framework for understanding and investigating *structural* network change, distinguish between ‘confined change’ (in which the change remains within the dyad and is not received or acted upon by other actors in the network) and ‘connected change’ (where a change in one relationship is received and acted upon by other actors in the network). Halinen et al. (1999) distinguish between incremental and radical change, where incremental change refers to a change in nature or content of relationships, while radical change implies that relationships are dissolved or new relationships are built. The IMP literature suggests that the general movement or direction of a network has effects for individual companies and vice versa (Håkansson et al. 2009).

The characteristic of ‘connectedness’ in the network structure is seen as an enabler for network change (Håkansson & Snehota 1995). Connectedness may lead to a chain effect resulting in changes in one business relationship affecting other relationships and hence propagating the change through the network. Håkansson and Snehota contend that this ‘chain effect’ resulting from connectedness is not automatic or deterministic, but rather the result of the actions taken by actors. Hertz (1999) and Dahlin, Fors, Havila and Thilenius (2005) emphasised the influence of *interconnectedness* (regarded as synonymous to ‘connectedness’ by the researcher) on the extent of transmission of change. Hertz (1999) used the term ‘domino effects’ to describe the situation where a change which is spread to another business relationship may cause a ‘domino effect’ among several connected business relationships in the network within a relatively short time. Related to the ‘domino effect’ concept is the notion of a ‘netquake’ (Dahlin et al. 2005) which is used to describe the transmission of change in business networks. The ‘netquake’ concept suggests that a high level of connectivity in a network means that changes spread more easily in the network and vice versa (Harilainen 2009).
2.4.1.9 Patterns of spread of change

Considering changes in a network from a holistic perspective, lessons emerge from the literature regarding patterns of spread of change in networks. First, IMP network literature suggests that incremental evolution is the main mode of network change (Halinen, Salmi & Havila 1999). Radical changes have been viewed as possible but unusual (Halinen, Salmi & Havila 1999). Second, IMP studies have recognised that processes of change may occur in parallel (concurrent) and/or in series (in sequence) (Halinen, Törnroos & Elo 2013; Håkansson & Snehota 1995). Third, IMP studies have proposed various levels of context from which the events making up the processes may emerge, such as the meta-, meso- and micro-level (Makkonen, Aarikka-Stenroos & Olkkonen 2012), which will be discussed further in subsequent sections.

2.4.1.10 Factors influencing spread of network change

Factors influencing spread of network change are discussed in various ways in the extant IMP literature, such as ‘events’, ‘context’ and ‘embeddedness’.

Events

As mentioned previously, many IMP studies view network change as caused by ‘factors’ and ‘events’. For example Håkansson and Snehota (1995) referred to exogenous and endogenous factors which may lead to network changes. Exogenous factors include changes in the general economic conditions, society, technology and culture (Håkansson & Snehota 1995). Endogenous factors refer to reasons within the organisation or network which result in actors initiating changes in relationships (Håkansson & Snehota 1995). Håkansson et al. (2009) referred to these exogenous and endogenous factors causing change as ‘surprises’ and suggest that changes occur in networks when ‘surprises’ interject the mundane day-to-day business life. Madhavan et al. (1998) described ‘occasions’ or events that trigger structural change in networks and consider such events to include major technological developments, the entry of strong competitors, changes in regulatory infrastructure and dramatic shifts in consumer preferences. In a similar vein, Hertz (1999) used the term ‘critical events’ to denote incidents that trigger radical change in a business dyad and/or network, criticality being determined by the way the parties of the focal and other
dyads react to the event (Halinen, Salmi & Havila 1999). Havila and Salmi (2000) also referred to critical events that trigger radical change.

**Context**

Another aspect influencing spread of network change is ‘context’. Many IMP researchers (Håkansson 1982; Håkansson & Snehota 1995; de Lurdes, Macbeth & Purchase 2006) emphasise that “context matters” (Wilkinson & Young 2013, p. 394) in understanding the behaviour and performance of organisations in networks. Wilkinson and Young (2013, p. 394) explain that “context is created by the history of past interactions, interconnection, events and the like.” The concept of ‘context’ is captured by the notions of ‘exogenous and endogenous factors’ (Håkansson & Snehota 1995) as well as the relationship ‘atmosphere’ and ‘environment’ contemplated in the Interaction model (Håkansson 1982). Many IMP researchers (Håkansson & Snehota 1995; Halinen, Törnroos & Elo 2013; Makkonen, Aarikka-Stenroos & Olkkonen 2012; Buttriss & Wilkinson 2004) have emphasised the *multiple levels* of context which is discussed in section 2.4.1.12.

**Embeddedness**

A further aspect influencing the spread of network change is the *embeddedness* (attributable to Granovetter (1985)) of organisations in networks where embeddedness “denotes the relations and dependence of business actors on one another and on larger entities such as countries, industries or marketing channels” (Halinen & Törnroos 1998, pp. 202-203). Halinen and Törnroos contend that embeddedness serves as a “force for change” (1998, p. 187) and that consideration of actors’ embeddedness in different networks is essential in understanding network change. They distinguish different types of embeddedness (temporal, spacial, social, political, market and technological).

Halinen and Törnroos (1998) distinguished two dimensions of embeddedness – vertical and horizontal dimensions. Vertical embeddedness is concerned with the relations between various identifiable ‘levels’ in a network. These vertical levels may relate to geographic levels (e.g. international, national, regional and local), to channel structure (e.g. supplier, manufacturer, distributor and customer) or to a specific business (industry, company, company unit/department and individual) (Halinen &
Törnroos 1998). The horizontal dimension of embeddedness is concerned with the relations of the actors within a specific network level. Relations among companies within a specific industry, among industries or within a specific geographical area are examples of horizontal embeddedness. On one horizontal level, business actors may be embedded in various competitive relationships and nets, or alternatively in cooperative arrangements. In summary, the vertical dimension refers to connections and dependencies between different levels in a network, whereas the horizontal dimension denotes the connections within a specific network level (Halinen & Törnroos 2005).

### 2.4.1.11 Process perspective on network change

As already mentioned, ‘spread’ as contemplated in the current study may be understood to be a process, the outcome of which is the adoption of ES practices by organisations. This section highlights the process perspective on network change, which is the perspective adopted in the current study. Halinen and Törnroos (1998) contend that while networks are commonly viewed as in a state of constant change, there is limited literature aimed at describing and explaining these dynamics or changes i.e. process research. This is echoed by Wilkinson and Young (2013) who submit that there is a lack of IMP studies concerning generic processes and drivers of change, i.e. mechanisms of network change. To answer this call there is a growing body of network change literature focusing on process (Lowe, Purchase & Ellis 2012; Lowe, Ellis & Purchase 2008; Purchase, Lowe & Ellis 2010; Ellis & Mayer 2001; Chou & Zolkiewski 2012; Halinen, Törnroos & Elo 2013; Buttriss & Wilkinson 2004, 2006, 2014; Wilkinson & Young 2012, 2013; Elo, Halinen & Törnroos 2010; Tidström & Hagberg-Andersson 2012; Held et al. 2014; Prenkert & Følgesvold 2014; Olaru & Purchase 2014). This process approach to understanding changes in phenomena may be viewed in contrast to the variables-based approach (Buttriss & Wilkinson 2014). The following sections expand on the process approach to network change.

**Definition of process**

IMP studies have long recognised studies from the management and organisational science literature concerning process research in organisational (as opposed to network) settings (van de Ven & Poole 1995; van de Ven & Huber 1990; Pettigrew
IMP researchers have adopted definitions of ‘process’ from organisational scientists such as Pettigrew who defined a process as “a sequence of individual and collective events, actions, and activities unfolding over time in context” (1997, p. 338). Similarly, Van de Ven (1992, p169 in Pettigrew 1997) found that the term ‘process’ is used in the literature to denote “a sequence of events that describes how things change over time.” Buttriss and Wilkinson (2014, p. 47) described process thinking as “considering phenomena dynamically in terms of movement, activity and temporal evolution.” These definitions of process highlight the importance of events, time and context in understanding processes, which is discussed in the following sections.

**Event-based approach to understanding network change**

Many IMP researchers have used an event-based approach to understanding network change and evolution, such as Halinen, Salmi & Havila (1999), Dahlin et al. (2005), Madhavan, Koka and Prescott (1998) and more recently Halinen, Medlin and Törnroos (2012), Elo, Halinen and Törnroos (2010), Halinen, Törnroos and Elo (2013), Buttriss and Wilkinson (2004; 2006) and Bairstow and Young (2011; 2012). However, the definition, identification, classification and use of ‘events’ has varied in the aforementioned studies. The definition and classifications of events are discussed in the following sections, while the identification and use of events in the study of processes of change is discussed in Chapter 3.

**Definitions of ‘events’ in process studies**

The use of events has been recognised as beneficial in studying network change (Chou & Zolkiewski 2012). Yet there are multiple definitions of the term ‘event’. Hedaa and Törnroos (2008, p324) define events in a business network as “temporally specific outcomes of performed acts by actors.” In the business network context, Elo et al. (2010, p. 3) suggested that an event can be seen as “an empirical occurrence and an element of network process” and that events are “temporally specific outcomes of performed acts by human actors that the actor itself discerns and perceives influential” (Elo, Halinen & Törnroos 2010, p. 4). While Elo et al. (2010) note the existence of (non-human) events of nature, such as hurricanes, Makkonen et al. (2012) explicitly consider both human and non-human events. Makkonen et al. (2012) define an event as describing human and non-human action or a mixture of
both over time and space, where an event describes what happened, with a beginning
and an end.

Drawing on the definitions above, an ES event in the current study is defined as:

\[
\text{a human or non-human occurrence which has a potential direct or indirect impact on ES practices over time and space.}
\]

For example, the implementation of a new environmental policy and an environmental disaster are ES events. Note that ES events may positively or negatively impact ES practices, for example, the abolishment of an environmental law would be an ES event, as was its implementation. The duration of the event is not specified in the current study and may occur over a short or long period of time.

**Classification of events**

The literature offers numerous categorisations of events, as relevant to the particular method and study. For example Elo et al. (2010) distinguished ‘normal’ and ‘critical’ events. Makkonen et al. (2012) differentiated between ‘focal’ and ‘contextual’ events, where a focal event is a sub-part of the network process in main focus and contextual events show the dynamic nature of the context around a process. Chou and Zolskiewski (2012) used the term ‘milestone’ events, reflecting that the criticality of the event depends on its context and actor perceptions, which are affected by the time and space dimensions. Milestone events may be ‘enabling’ and assist a process or activity or ‘inhibiting’, where the event hinders a process or activity. Some researchers segregate relevant and irrelevant events for the process under study (Halinen, Törnroos & Elo 2013; Elo, Halinen & Törnroos 2010), noting that such a distinction often only emerges as the holistic picture of the processes and the contextual factors fall into place later in the research process. The last-mentioned approach is used in the current study, where events are identified as relevant as the research process progresses.

Events have also been classified according to the different organisational or network levels from which they emerge, such as from a business unit, company, dyad, net, network or broader environmental level (Elo, Halinen & Törnroos 2010). Put another way, events have been classified as emerging from the micro-, meso- or macro-level
processes of an economy (Elo, Halinen & Törnroos 2010). The use of levels in understanding network change is employed in the current study and is discussed further in the following section.

2.4.1.2 Levels of analysis/context/processes or aggregation in networks

Many IMP researchers, such as Halinen and Törnroos (1998), Håkansson (1982), Håkansson and Snehota (1995), de Lurdes et al. (2006), Juho et al. (2010) and Makkonen et al. (2012), have referred to various levels of analysis, context, processes and aggregation in networks. Halinen, Medlin and Törnroos (2012) contend that a variety of processes may evolve in parallel and several micro-level processes may create upper level processes and vice versa. They also contend that the parallel processes may occur at the same level or at different levels. Halinen et al. (2012) highlight that it can be hard to find root causes and events that influence the process of change being studied. They advocate the connection of events and processes from different levels (individuals, organisations, relationships and nets) to each other. This notion of ‘levels’ in networks is investigated empirically in the current study.

2.4.2 IMP literature addressing sustainability issues

As mentioned in Chapter 1, there is limited, but growing, IMP literature addressing ES and sustainability issues (Öberg, Huge-Brodin & Björklund 2012). For example, Ritvala and Salmi (2010) explored the formation of three issue-based nets addressing the environmental degradation of the Baltic Sea. Brekke (2009) in his PhD thesis looked at the relationship between the economy and the environment using both IMP and actor-network theory. Nogueira, Araujo and Spring (2010) investigated the development of sustainability strategies using the industrial network approach. Öberg, Huge-Brodin and Bjorklund (2007; 2009) demonstrated the need to view environmental effects and impacts from a network perspective rather than individual company perspective. Hulthen and Gadde (2009) explored the challenges and opportunities associated with enhanced attention to sustainability employing the ARA model. Ljung (2011) studied CSR in network theory focusing on non-business actors from both the public and civil society sectors, such as regulators and non-governmental organisations. Harrison and Easton (2002) investigated organisations’
response to environmental change from IMP network and strategic management perspectives.

Some IMP network literature has approached sustainable solutions from an innovation and technological development perspective (Håkansson & Waluszewski 2002a, 2007; Raman, Davies & Elson 2013; Baraldi, Gregori & Perna 2011). Håkansson and Waluszewski (2002a) investigated the network interactions surrounding IKEA's adoption of more sustainable paper for their catalogue. Baraldi, Gregori and Perna (2011) investigated the connection between network evolution and the embedding of a new technology, namely Leaf House, Italy’s first zero-carbon emission house. They focused on the resource layer of relationships and used the four-resources (4R) model to analyse the embedding of this innovation. Raman, Davies and Elson investigated the development and diffusion of sustainability innovations in business networks (Raman, Davies & Elson 2013; Raman & Davies 2012). However, the focus of the current study is not on the development of technologies and innovations, but rather on the processes of spread of ES practices between organisations. Also, some but not all ES practices can be regarded as ‘innovations’ (as discussed further in section 2.5). Thus, the IMP literature dealing with ‘innovations’ is not a core focus in the current study.

The IMP studies concerning sustainability that are most closely related to the current study are Harilianen’s (2009) conceptual framework for the spread of CSR practices already discussed previously and Raman, Davies and Elson’s (2012, 2013) work dealing with the development and diffusion of sustainability innovations in business networks mentioned above. The contemplation of diffusion in IMP network is discussed further in section 2.5.2.

Many researchers have linked ‘sustainability’ with systems theory and multiple levels of analysis, which relates back to the previous discussion of ‘levels’. For example, Starik and Rands (1995) explored the concept of ecological sustainability and applied it to organisations using a systems framework and multiple levels of analysis. They contended that sustainability and sustainable development have multi-level and multi-system characteristics and that the achievement of sustainability requires an effective integration of these multiple levels and systems. They suggested that “integration involves the assumptions that (a) an ecologically
sustainable world requires ecologically sustainable societies, cultures, political and economic systems, organisations, and individuals and that (b) achievement of sustainability by an entity at any one of these levels requires simultaneously recognizing and addressing the actions of and interactions with entities at each of these levels” (Starik & Rands 1995, p. 909). They identified five levels of analysis that influence the ecological sustainability of organisations: the individual, organisational, political-economic, social-cultural and ecological levels. They mentioned that an organisation interacts with all five levels, contending that organisations have ecological relationships with nature, individuals, one another, with the political-economic level and social-cultural level. The latter two relationships refer to the context in which the organisation operates and the influence of this context on the organisation’s ecological sustainability, which relates to the ‘context’ discussed previously.

2.4.3 Synopsis of IMP conceptualisations of network change

IMP network theory contemplates changes occurring in networks as a result of interactions between organisations (Håkansson 1982; Håkansson & Snehota 1995). It sees dyadic relationships as the key unit of analysis for considering changes, since changes in one dyadic relationship can be spread to other connected dyadic relationships (Håkansson & Snehota 1995). However, there is consideration in the literature of ‘issue-based nets’ as units of analysis (e.g. Brito, 1999). Factors influencing change include exogenous and endogenous events, the context of the organisations, dyads and network, as embodied in the terms relationship ‘atmosphere’ and relationship ‘environment’ (Håkansson 1982). The extent of the change in the network is influenced by the embeddedness (Halinen & Törnroos 1998), connectedness (Håkansson & Snehota 1995; Havila & Salmi 2000; Dahlin et al. 2005) and interdependence (Håkansson & Snehota 1995; Chou & Zolkiewski 2012) of organisations in the network. An increasing number of IMP studies focus on the processes of network change by analysing sequences of events over time, following a processual research approach (Halinen, Törnroos & Elo 2013; Buttriss & Wilkinson 2004, 2006; Elo, Halinen & Törnroos 2010; Makkonen, Aarikka-Stenroos & Olkkonen 2012), with an increased focus on the use of complexity theory for understanding change in industrial networks (Wilkinson & Young 2013; Buttriss &
Wilkinson 2014; Held et al. 2014; Thompson & Young 2014). The ‘events’ making up the processes have been defined, classified and analysed in many ways (Chou & Zolkiewski 2012; Havila & Salmi 2000; Halinen, Tönnroos & Elo 2013; Makkonen, Aarikka-Stenroos & Olkkonen 2012). Processes giving rise to network change can occur in parallel and/or sequence (Halinen, Medlin & Törnroos 2012) and the outcomes of the changes are unpredictable because of multiple ‘network effects’ that occur when changes are made in one part of a network and reacted to and re-reacted to and so forth (Håkansson & Snehota 1995; Halinen, Törnroos & Elo 2013). Many researchers are advocating analysis of processes, events and context at multiple levels to try to disentangle the complexities of studying processes in the industrial network environment (Halinen, Törnroos & Elo 2013; Elo, Halinen & Törnroos 2010; Makkonen, Aarikka-Stenroos & Olkkonen 2012; Buttriss & Wilkinson 2004, 2006). Next, the following section discusses the conceptualisations of spread arising from the diffusion of innovations literature.

2.5 Conceptualisation of spread from the Diffusion of Innovations (DOI) literature

The notion of ‘spread’ brings to mind the concept of ‘diffusion’ of innovations which considers how new ideas, practices etc. are spread throughout systems; or not spread. There is a vast bank of literature dealing with the ‘diffusion’ of innovations. The research has a long history dating back to the 1940s with the famous Ryan and Gross (1943) study of the diffusion of hybrid seed corn in Iowa (Rogers 2003). Rogers (1962) has been a significant contributor to this field. Rogers developed the well-known ‘s-shaped’ cumulative adoption curve (presented in Figure 5), which shows the number of new adopters each year and the cumulative number of adopters of hybrid seed corn in two Iowa communities, attributable to Ryan and Gross, 1943 (Rogers 2003). Figure 5 shows the new adoption numbers of an innovation growing slowly at the beginning of the time period, then increasing in rate, and then slowing down in new adoptions later in the time period as more of the social system have already adopted (Rogers 2003).
Figure 5: S-Shaped cumulative adoption (Rogers 2003, p. 273)

Diffusion is defined as:

“the process by which (1) an innovation (2) is communicated through certain channels (3) over time (4) among the members of a social system” (Rogers 2003, p. 11).

An innovation refers to:

“an idea, practice, or object that is perceived as new by an individual or another unit of adoption” (Rogers 2003, p. 12).

A social system is defined as:

“a set of interrelated units that are engaged in joint problem solving to accomplish a common goal” (Rogers 2003, p. 23).

Members or units of a social system include individuals and organisations. Some researchers restrict the term ‘diffusion’ to refer to the spontaneous, unplanned spread of new ideas, while using the term ‘dissemination’ for diffusion which is directed and managed (Rogers 2003; Greenhalgh et al. 2004). However, Rogers uses the term ‘diffusion’ to refer to both the spontaneous and planned spread of new ideas, which
is followed in the current study. While much of the extant work has concerned the diffusion of technical innovations, such as mobile telephones, the notion of ‘innovation’ also includes practices, processes and ideas, such as the use of seat belts and the practice of recycling (Rogers 2003).

Considering the aforementioned definitions and examples, some ES practices, which are ‘perceived as new’ by other organisations (‘members of the social system’), can be regarded as ‘innovations’, as defined in the DOI literature. However, it is submitted that not all ES practices would be perceived as ‘new’. For example, some ES practices may have been used by an organisation previously, discontinued and then reintroduced again when required by law or a buyer. Thus, it is submitted that not all ES practices fall into the definition of ‘innovations’. ‘Diffusion’ is thus regarded as a sub-process of spread in the current study.

The following reasons highlight why the term ‘diffusion’ is not the appropriate title for the current study. Diffusion studies have traditionally focused on measuring rates of diffusion, methods of diffusion, the characteristics of innovations that influence diffusion, as well as the characteristics of members of society that make them likely to adopt (Rogers 2003). The current study is not interested in measuring rates, and while it is interested in methods of spread and characteristics of ES practices and adopters, it is more explorative and is interested in understanding the multiple processes of spread and characteristics of spreaders, adopters and non-adopters in a broader context.

Further, diffusion studies are often presented from the perspective of the spreader, not the adopter, using a uni-directional approach (Makkonen 2011). In contrast, the current study incorporates multi-sided views on spread from organisations in different positions in the network and the feedback effects between the factors influencing spread, the processes of spread, the spreaders and other members of the network, representing a multi-directional and interactive approach (Håkansson 1982; Håkansson & Snehota 1995).

Diffusion studies often focus on the diffusion of a specific innovation or a particular basket of innovations (Rogers 2003; Makkonen 2011; Raman, Davies & Elson 2013), whereas the current study considers the spread of ES practices which may
differ from organisation to organisation as spread occurs. The current study focuses on processes and how organisations approach the idea of ‘going green’, including their choice of which ES practices to implement, if any. Thus, the term ‘spread’ includes diffusion but is not limited to Rogers’ (2003) definition of the term ‘diffusion’ of innovations. Since ‘diffusion of innovations’ is not the focus of the current study, the review focuses on understanding the basic principles of traditional DOI theory and the combined IMP and DOI literature, but does not purport to review the large body of DOI literature.

2.5.1 Principles of diffusion of innovations theory

2.5.1.1 Characteristics of innovations

Rogers (2003) found that the characteristics of innovations (such as relative advantage, compatibility, complexity, trialability and observability), as perceived by the unit of adoption, influences the rate of adoption. He found that most of the variance in the rate of adoption of an innovation (from 49 to 87 per cent) is explained by these characteristics. The current study includes an investigation of the effect of the characteristics of ES practices on their spread, as discussed further in section 2.8.

Diffusion scholars have found that the above ‘relative advantage’ characteristic is one of the strongest predictors of an innovation’s rate of adoption, where relative advantage refers to the ratio of the expected benefits to the costs of adoption of an innovation. ‘Relative advantage’ includes factors such as economic profitability, low initial cost, a decrease in discomfort, social prestige, a saving of time and effort and immediacy of reward (Rogers 2003). Governments can increase the relative advantage of an innovation by providing incentives, such as tax rebates for the adoption of solar heating.

The ‘immediacy of reward’ factor of ‘relative advantage’ has been found to be the factor that leads to a low rate of adoption of ‘preventative’ innovations. A preventative innovation, such as HIV/AIDS prevention practices, refers to a new idea that is adopted to avoid the possible occurrence of some future event (Rogers 2003). Many ES practices are likely to be ‘preventative’ in nature. For example, ES practices to prevent environmental disasters such as oil spills from carrier ships are preventative practices which require costs to be incurred today to prevent a possible
oil spill in the future. Since the occurrence of the future event is uncertain, preventative innovations have a slower rate of adoption (Rogers 2003). Preventative innovations may spread due to a ‘cue-to-action’ i.e. an event that leads to a change in circumstances, such as an environmental disaster. Such cues-to-action resonate with the ‘critical events’ or ‘surprises’ discussed in section 2.4.1.10.

Other factors affecting the rate of adoption are the type of innovation decision (optional, collective or authority), the nature of communication channels diffusing the innovation at various states of the innovation-decision process (such as mass media versus interpersonal interactions), the nature of the social system (discussed in the next section) in which the innovation is diffusing and the extent of the change agents efforts in diffusing the innovations (Rogers 2003). A ‘change agent’ is an individual or organisation who influences innovation-decisions in a direction deemed desirable by a change agency, using approaches ranging from empathetic to top-down coercive (Rogers 2003). Rogers refers to the notion of ‘critical mass’ which “occurs at the point at which enough individuals in a system have adopted an innovation so that the innovation’s further rate of adoption becomes self-sustaining” (Rogers 2003, p. 343). Rogers notes that the end result for a successful change agent activity is a self-perpetuating process which no longer needs change agent intervention.

2.5.1.2 The nature of the social system

The diffusion of innovations is affected by the nature of the social system in which the diffusion occurs (Rogers 2003). One of the characteristics of the social system affecting the diffusion of innovations is the ‘network interconnectedness’, defined as the “degree to which the units in a social system are linked by interpersonal networks” (Rogers 2003, p. 327). This has a resonance with the IMP ‘connectedness’ concept (Håkansson & Snehota 1995). Rogers discusses the importance of interpersonal network influences on individuals in convincing them to adopt. Opinion leaders (Watts & Dodds 2007) are members of the social system who are able to influence other individuals’ attitudes or overt behaviour informally in a desired way with relative frequency (Rogers 2003). Rogers contends that “the heart of the diffusion process is the modelling and imitation by potential adopters of their near peers’ experience with the new idea” (Rogers 2003, pp. 330-331).
The diffusion of innovations is sped up when there is homophily, which means a high degree of similarity among pairs of communicating units of adoption in the social system, since this leads to more effective communication and understanding between the members of the system (Makkonen 2011). However, similar to Granovetter’s (1973) theory of “the-strength-of-weak-ties” some heterophilious (the opposite of homophilious) interpersonal links (called bridges) are necessary to facilitate communication between different homophilious cliques (Rogers 2003), for further diffusion to occur. The diffusion of innovations has also been shown to be affected by ‘structural equivalence’, which occurs when two members of the social system have the same social space in the structure of the network (Rogers 2003). The notions of homophily, heterophily and structural equivalence concentrates on structural characteristics of the social system (network) and resonates with the network change literature concentrating on changes in structure of the network.

2.5.1.3 Characteristics of adopters

Rogers not only characterises innovations but also distinguishes various categories of adopters of an innovation which affect their adoption of innovations. He differentiates between innovators, early adopters, early majority, late majority, and laggards, as shown in Figure 6.

![Figure 6: Adopter categorisation on the basis of innovativeness (Rogers 2003, p. 281)](image)

2.5.1.4 Diffusion studies related to organisations

Rogers (2003) suggested that an innovation spreads among the companies in an industry in a diffusion process that is similar to the way that an innovation diffuses among the individuals in a community or some other system. Thus, the same
principles applying to individuals are applied to organisations as units of adoption or members of a social system. In the 1970s diffusion studies involving organisations were focused on organisational innovativeness, then the research moved to the innovation process within an organisation (Rogers 2003).

2.5.2 Combined DOI and IMP network literature

There are a few studies connecting the DOI and IMP network theory (Makkonen 2011; Cantu & Tzannis 2011; Raman, Davies & Elson 2013). Makkonen (2011) found the lack of linkage or joint consideration of DOI and IMP network approaches in the literature as “odd” (Makkonen 2011, p. 1) since both approaches place emphasis on network dynamics. Makkonen (2011) provided an interesting conceptual and empirical comparison between the innovation adoption/diffusion and industrial network approaches. Makkonen concluded that the DOI approach does not take into account the effects on adoption of previous development, relationships or other structural elements of the relational setting of actors and their activities. Rather, the DOI approach focuses on the innovation to be diffused and the related communication. “As a result, the phenomenon is considered unique and actors are assigned the static roles of opinion leaders and change agents. This fits poorly with the empirical data” (Makkonen 2011, p. 16). Makkonen suggested that the weaknesses in the DOI approach arises because the approach was originally developed to describe the spread of ‘new-to-the-world’ innovations, but is often, as in Makkonen’s study, extended to include the adoption and diffusion of ‘new-to-the-adopter’ innovations (Makkonen 2011, p. 16).

Makonnen’s comparison of the two approaches thus supports the use of the IMP network approach as the theoretical foundation to capture all the interactions relating to ‘spread’ in the current study. Makkonen suggests that the IMP industrial network approach affords a “wider and perhaps more realistic view of adoption and diffusion” and since it takes into account “the relational setting between actors and their activities in the context of the past, present and future it provides a solid framework for a single, temporary adoption process” (Makkonen 2011, p. 16). The IMP network approach allows for the identification of the various actors affecting the adoption process directly or indirectly and the specific drivers in terms of actor bonds,
interconnectedness, and resource dependency (Makkonen 2011), all of which are relevant in the current study.

Raman, Davies and Elson (2013) developed a theoretical framework relating to the development and diffusion of sustainability innovations in business networks. They contended that many sustainability initiatives have been successfully developed, but their adoption and diffusion have been relatively slow. They suggested that IMP network theories can be combined with Rogers’ (1962) diffusion of innovations theories to develop a theoretical framework to trace the adoption and diffusion of sustainability innovations within the network. They cautioned that most extant diffusion studies have involved the diffusion of comparatively simple ideas and products compared with complex sustainability innovations. One of the findings in their empirical study was that for a sustainable solution to develop it has to have both financial and environmental benefits.

The DOI approach has been studied in other ‘network’ contexts, such as the work of Valente considering the DOI and social network theory (1996). Valente (2003) also developed a general mathematical model of the diffusion of innovations, incorporating mass media and interpersonal influence. Woodside and Biemans (2005) discuss the process of innovation, manufacturing, diffusion and adoption/rejection of radical innovations from an intra-organisation and inter-organisation perspective. A further cross-disciplinary application of DOI is found in a study by Zhu, Sarkis and Lai (2012) which combines ecological modernisation theory, DOI theory and green SCM.

2.5.3 Synopsis of DOI conceptualisations of spread

The brief review shows the focus of DOI literature is on aspects such as the characteristics of innovations that influence their spread and the characteristics of members of a social system which affect their propensity to adopt innovations. The focus of DOI literature has not been on the interactive processes between various organisations, as is the emphasis in the current study. There is limited literature combining the DOI and IMP network theory. DOI is defined to relate to ‘innovations’; some but not all ES practices contemplated in the current study can be defined as ‘innovations’. Nevertheless, the DOI literature offers useful terms and
concepts that will be considered when analysing the data and developing an understanding of the spread of ES practices in the current study.

2.6 Complexity theory conceptualisations of spread

Based on the description and examples of complex systems provided in the following section, industrial networks are regarded as complex systems (Wilkinson & Young 2013; Held et al. 2014; Ritter, Wilkinson & Johnston 2004). Hence an understanding of how complex systems literature views spread processes is relevant to the current study. In the following sections the fundamental ideas of ‘complexity theory’ are introduced. Thereafter, the literature combining complexity theory and sustainability is reviewed. Later, the implicit and explicit interlinks between the IMP network and complex systems approach is discussed, together with the potential contribution of lessons from complexity theory to the objective of the current study.

2.6.1 Fundamentals of complexity theory

2.6.1.1 Background and definitions

‘Complex systems’ have received increased attention over the past three decades from a diverse set of scientific disciplines leading to the emergence of a broad interdisciplinary ‘science of complexity’ (Maguire 2011). Complex systems can be biological, physical or social systems that are composed of many parts (ARC Centre for Complex Systems 2009). Examples of complex systems include ant colonies, sporting teams, the Internet, economic markets, the weather, energy systems and the brain (ARC Centre for Complex Systems 2009), as well as organisations and groups of organisations (Maguire 2011). While the constituent parts are often simple, the interactions between the large numbers of parts may produce complex overall behaviour (ARC Centre for Complex Systems 2009).

Eisenhardt and Piezunka (2011) contended that there has been a major paradigm shift from a reductionist to a holistic perspective. They explained that since the 1600s, reductionalism has been the dominant scientific method in Western theories resulting in large problems being broken down into simpler, constituent problems. Knowledge of a system’s parts was assumed to be adequate for understanding the system as a whole. However, Eisenhardt and Piezunka (2011) contended that the reductionalist
approach often obscures an understanding of the entire system with its emergent, system level, ‘complex’ behaviour.

In addition to the various disciplines interested in aspects of complexity, governments and policymakers are also increasingly interested in understanding complex systems. For example, CSIRO, the Commonwealth Scientific and Industrial Research Organisation in Australia, is developing and using new analytical techniques in complex systems science, drawing on contributions from the social sciences, environmental sciences, chemistry, economics, physics and mathematics (CSIRO 2014). Complexity theory has also been used in biology, computer science, marketing and management studies (Eisenhardt & Piezunka 2011; Wilkinson & Young 2013). Some IMP network research has integrated complexity theory into their studies (Ritter, Wilkinson & Johnston 2004; Wilkinson & Young 2013; Purchase, Olaru & Denize 2014; Olaru & Purchase 2010, 2014; Olaru, Denize & Purchase 2008; Held 2010; Buttriss & Wilkinson 2014; Thompson & Young 2014), as is discussed further in section 2.6.3.

Given its diverse origins, there is no single science of complexity, single theory of complexity, nor agreement on how to conceptualise, define or measure complexity (Maguire 2011; Prietula 2011; Cilliers 2011; Thompson & Young 2014).

Definitions of *complexity science* include:

“the systematic study of complex systems as well as the phenomena of emergence and complexity to which they give rise” (Maguire, Allen & McKelvey 2011, p. 2) and,

“the scientific study of systems with many interacting parts that exhibit a global behaviour not reducible to the interactions between the individual constituent parts” (Thietart & Forgues 2011, p. 53).

Similarly, Maguire et al. (2011) explained that a *complex system* can be seen as a ‘whole’ which is comprised of a large number of interacting ‘parts’ or ‘agents’. Each part is governed by a rule or force which relates its behaviour in a given time period contingently to the states of other parts. The interactions among the parts are usually, though not necessarily, local and rich, and can be material and informational.
Through the process of individual parts responding to their own specific local contexts in parallel with other parts “qualitatively distinct emergent patterns, properties and phenomena can arise at the level of the system despite the absence of explicit inter-part coordination” (Maguire, Allen & McKelvey 2011, p. 2). This process of upward causality leads to system-level outcomes which are very difficult to predict based on knowledge of the parts and rules, referred to as ‘predictable unpredictability’ (D’Alessandro & Winzar 2014). The emergent system-level phenomena can also exert downward causality on the parts of the system based on the same rules that brought the emergent phenomena into existence (Maguire, Allen & McKelvey 2011). Maguire et al. thus contended that complexity arises “when emergent system-level phenomena display patterns in time and space that are neither static nor random but are, rather, difficult to describe parsimoniously” (2011, p. 2).

Eisenhardt and Piezunka (2011) considered the term ‘complexity’ to denote a specific type of behaviour that emerges from complex adaptive systems (CAS) and not the system itself (note CAS is one school of thought of complexity theory (Thietart & Forgues 2011)). They explained that a CAS is made up of partially connected agents whose interaction gives rise to the ‘complex’ behaviour that is characteristic of complex systems (2011). ‘Complex’ behaviour is seen to emerge at the ‘edge of chaos’, which is the transition phase between randomness and regularity. Examples of the ‘edge of chaos’ from the natural world include the transition zone between water and ice and the area around underwater heat vents. At the edge of chaos a ‘dissipative’ equilibrium exists, meaning an unstable condition where the system is continually falling away from equilibrium. To maintain such a dissipative equilibrium, energy must continuously be injected into the system. Eisenhardt and Piezunka (2011) contended that a central focus of complexity theory is on the structures (such as rules, scale, formalisations, and connections) which allow reaching and operating at the ‘edge of chaos’.

Cilliers (2011) emphasised that the distinction between ‘complexity’ and ‘chaos’ should be maintained and that while these terms have a certain history, they are sometimes intertwined with too much ease. ‘Chaos’ is regarded as “that slice of [complexity] theory concerning itself with deterministic and recursive [i.e. repeats the same pattern but starts at different points] nonlinear equations, fractal
mathematics, self-similarity, bifurcations, power laws and universal constants”, whereas ‘complexity’ “refers to a more general understanding of complex systems which focuses on (nonlinear) relationships, systemic interaction, boundary problems, emergence and adaptation” (Cilliers 2011, p. 143) (brackets added).

‘Restricted’ and ‘general’ complexity is distinguished, where restricted complexity is exemplified in those approaches to complexity that developed from chaos theory and fractal mathematics, which “focus on underlying patterns and universal principles which are still highly reductive in nature” (Cilliers 2011, p. 143). In contrast, ‘general’ complexity tries to comprehend the relations between the whole and the parts since knowledge of the parts and the whole individually is not sufficient. In ‘general’ complexity “the principle of reduction is substituted by the principle that conceives the relation of whole-part mutual implication” (Cilliers 2011, p. 143). The current study is concerned with ‘general’ complexity and the interactions between the parts (organisations and individual processes) and the potential emergent behaviour (further processes of spread of ES practices).

### 2.6.1.2 Schools of complexity science

Maguire (2011) differentiated between two broad scientific programmes in the development of complexity science, a European School of Complexity and the North American school. The European School of Complexity is based firstly on the physical sciences placing emphasis on far-from-equilibrium conditions to investigate ‘self-organisation’ and secondly, in parallel, on ‘synergetics’ emerging from work on lasers (Maguire 2011). On the other hand, the North American school is based on life sciences and makes extensive use of computational approaches, such as agent based models, e.g. Epstein (1999).

Thietart and Forgues (2011) distinguished the following five major schools of thought in complexity science:

1) self-organising systems,
2) deterministic chaos,
3) path dependence,
4) CAS and
5) an emergent ‘sectionalist’ contexts view.
The first school of thought is also known as autogenesis or synergetics and aims at explaining the emergence of order out of the interactions between entities such as chemical elements and organisational actors (Thietart & Forgues 2011). The second and third schools of thought are similar in sensitivity-dependence characteristics, but differ in that chaos theory is deterministic, while path dependence is stochastic (Thietart & Forgues 2011). The third school of thought, developed by Arthur (1989), refers to a situation where a path may become locked in once chance puts one on that path, regardless of the advantages of other paths (Thietart & Forgues 2011). A famous case of path dependence is where QWERTY came to be the dominant keyboard arrangement (Thietart & Forgues 2011). Path dependence has been explored within the IMP network theory (Harrison & Araujo 2000; Håkansson & Waluszewski 2002b) which is discussed further in section 2.6.3. The fourth school of thought, namely CAS, emphasises that simplicity arises from the aggregated behaviour of interdependent adaptive agents driven by a set of rules (Thietart & Forgues 2011). Agents, following rules, adapt to each other and create an emergent order. CAS is increasingly being used in IMP studies (Wilkinson & Young 2013; Held et al. 2014; Oluaru & Purchase 2014). In the last school of thought top-down forces control bottom-up (i.e. naturally occurring) autonomous and innovative initiatives (Thietart & Forgues 2011). Multiple Darwinian variation, selection, retention and competitive struggle effects results in order at different levels and each emergent level becomes a selectionist context for the level below (Thietart & Forgues 2011).

2.6.1.3 Characteristics of complex evolving systems

Mitleton-Kelly (2003) suggested that while there is not a universally accepted definition of ‘complexity’, there are ten generic principles of complexity or characteristics of complex evolving systems and enabling infrastructures which lead to the creation of new order namely:

1) self-organisation,
2) emergence,
3) connectivity,
4) interdependence,
5) feedback,
6) far from equilibrium,
7) space of possibilities,
8) co-evolution,
9) historicity and time and,
10) path-dependence.

These generic principles are based on complexity theories emanating from the
natural sciences (dissipative structures), chemistry-physics, CAS, evolutionary
biology, autopoiesis (self-generation), biology/cognition, chaos theory and the social
sciences (increasing returns, economics) (Mitleton-Kelly 2003). The concepts of
emergence, connectivity, interdependence, feedback, co-evolution, historicity and
time and path-dependence resonate with IMP network theory, as discussed further in
section 2.6.3.

Maguire (2011) also contended that despite challenges in delimiting and describing
complex systems, there is more or less broad agreement as to their key features.
Maguire (2011) cited Cilliers (1998) features of complex systems as follows:

1) complex systems consist of a large number of elements,
2) these elements interact dynamically,
3) interactions are rich; any element in the system can influence or be influenced
   by any other,
4) interactions are nonlinear,
5) interactions are typically short range,
6) there are positive and negative feedback loops of interactions,
7) complex systems are open systems,
8) complex systems operate under conditions far from equilibrium,
9) complex systems have histories and,
10) individual elements are typically ignorant of the behaviour of the whole
    system in which they are embedded.

All of these features resonate with Mitleton-Kelly’s (2003) generic principles of
complexity above and with IMP network theory (please see section 2.6.3). These
features of complex systems will be considered when analysing the empirical data
from the networks which are regarded as complex systems in the current study. By
considering the data in terms of these characteristics, insights will be sought as to the possible implications of these system features on the spread of ES practices in a complex system/network. The following section considers the characteristic of historicity and time, as well as ‘context’ in complex systems.

2.6.1.4 Time, history and context in complex systems

Maguire (2011) echoed Mitleton-Kelly’s generic principle of historicity and time in complex systems, highlighting its importance and that the evolution of a complex system is typically characterised by path dependence and irreversibility. Also, since interactions among agents may be characterised by non-linearity, small causes are associated with disproportionately large effects in the system and complex systems are sensitive to initial conditions, i.e. context.

Byrne (2011) explained that outcomes of interactions between parties arise not only from the interactions and actions of these two parties, but also as a result of the context in which the interaction takes place, as well as the emerging results of the interactions. The consequence is that the outcomes of the same interaction can differ in different places and at different times. This implies that a governance approach or organisational arrangement applied in two different contexts can result in very different outcomes. This has implications for the spread of ES practices e.g. the success of a government intervention to spread ES practices is affected by the industry factors (context) and organisational factors (context) such that the same intervention in different industries and organisations may lead to different results.

2.6.1.5 Multi-levels of complex systems: Individuals, organisations and groups of organisations as complex systems

An individual may be considered to be a complex system (Espinosa & Walker 2011). Also, an organisation can be regarded as a complex system (made up of individuals, business units or value chain activities) (Maguire 2011). Similarly, a group of organisations, for example those making up an industry, economy or industrial network (Wilkinson & Young 2013), can also be viewed as a complex system (Maguire 2011). Maguire explained that in each of these ‘wholes’ (individual, organisation or group of organisations) “it is possible for a coherent, mutually
consistent ecology of interacting ‘parts’ to emerge from what is effectively a bottom-up and highly distributed process of construction” (Maguire 2011, p. 83).

Maguire et al. (2011) contended that ‘complexity’ is the natural framework for considering organisations and connected entities, which supports the consideration of complexity theory in the current study. A complexity framework considers a network which has links that change, nodes that change internally and capabilities that develop and change over time. Maguire et al. explained that complexity science “offers conceptual and methodological tools to tackle issues of emergence, self-organisation, evolution and transformation by elucidating the mechanisms through which micro-level events and interactions can give rise to macro-level system structures, properties and behaviours” (Maguire, Allen & McKelvey 2011, p. 10). Wilkinson and Young (2013) echoed this sentiment in suggesting that a complex systems approach offers additional understanding of mechanisms and processes in business networks. Since the current study is concerned with the mechanisms and processes which give rise to the spread of ES practices and the resultant patterns of spread of ES practices, complexity science appears to offer relevant insights.

2.6.1.6 Strategy and management in complex systems

Eisenhardt and Piezunka (2011, p. 507) suggested that complexity theory “calls for a fluid organisation with multiple motors of adaption that enable the firm to coevolve with changing environments.” They go on to contend that the key challenge for corporate strategy is finding the right balance between too much and too little structure in complex systems such as organisations, since too much structure is overly rigid, while too little structure is too chaotic. They discuss the optimal amount of structure in complex systems suggesting that:

“partially connected systems of agents are higher performing than ones that are highly coupled or highly decoupled … When constitutive elements of the system are over-connected, the system becomes gridlocked and cannot adapt to new opportunities” (Eisenhardt & Piezunka 2011, p. 509).

They explained that if an organisation (complex system) is too highly structured it cannot address sufficient opportunities to succeed. In contrast, if the elements of a system are under-connected, the system becomes too disorganised and error-prone to
adapt. Thus, they conclude that only partially connected systems (i.e. a moderate degree of structure) are both flexible and efficient.

2.6.1.7 Policy decisions in complex systems

Environmental laws and regulations are likely to play an important role in the spread of ES practices, thus the following comments on a complex systems approach to policy decisions is relevant in the current study. Bankes (2011) highlighted that policy decisions made by government agencies, companies and individuals usually concern systems that are complex and open. Bankes explained that policy effects “ramify through multiple iterated decisions, each a nonlinear function of perceived circumstances, where decisions by individual human agents can occasionally tip outcomes” (2011, p. 570). There are hence multiple interacting forces involved in policy decisions, where economic realities can affect political processes, and in turn be affected by environmental, cultural, technological, and military developments. These complexities and interactions of policy effects in addition to multiple interacting forces, imply that policies may produce unintended side effects (Bankes 2011).

2.6.2 Combined complexity theory and sustainability literature

Many researchers believe that complexity theory has much to contribute to sustainability issues (Espinosa & Walker 2011; Jones 2011; Wagner & Svensson 2011). Espinosa and Walker (2011) have proposed the Viable Systems Model (VSM) of Stafford Beer as a holistic way of understanding and addressing sustainability in complex systems.

2.6.2.1 VSM model

The VSM was developed by Stafford Beer since the 1950s and is a key contribution from the cybernetics area of complexity theory (Espinosa & Walker 2011; Merali & Allen 2011). Cybernetics is described as concerning “how a system governs, or regulates itself” (Espinosa & Walker 2011, p. 11). Merali and Allen (2011) contend that a major contribution of cybernetics to management science in the early twentieth century was the conceptualisation of feedback loops (mentioned as a generic characteristic of complex systems by Mitleton-Kelly (2003)) between system
components as regulating mechanisms for the system’s performance. With feedback loops, the overall regulatory mechanism for the system is based on the existence of a circular arrangement of causally connected components where the output of each component either has a positive or negative effect on the output of the next component. Thus, the overall system behaviour depends on the cumulative effect of all the links between its components. An odd number of negative links will result in the system displaying a self-balancing behaviour, while an even number of negative links will result in the system displaying a self-reinforcing exponential runaway behaviour (Merali & Allen 2011).

Beer’s viable system is “a system able to adapt and to thus maintain an independent existence as it co-evolves with a changing environment” (Espinosa & Walker 2011, p. 13). Beer proposed the VSM as a “generic blue-print, or template, for the organising structure of any autonomous system. According to Beer, any organisation can be defined in VSM terms as a set of systems nested within systems, embodying a recursive organising structure” (Merali & Allen 2011, p. 34). Espinosa and Walker (2011, p. 33) referred to the idea of recursion and nested systems as “systems within systems within systems” following Beer’s ‘Recursive System Theorem’ which suggests that “[i]n a recursive organisational structure, any viable system contains, and is contained in, a viable system” (Beer, 1979, p. 118; Beer, 1985, xi, in Espinosa and Walker, 2011, p. 34). Explained another way: any viable organisation consists of clusters of small viable-systems at (say) Level 1, which come together to cohere into a larger Level 2 system, which is also a viable system working with the same laws and axioms. Level 2 viable systems then cluster together and cohere into a Level 3 viable system and so forth (Espinosa & Walker 2011).

The VSM thus provides a generalised way of understanding a complex system, such as an individual, an organisation, a network or a country. Inspired by the body, brain and environment facing a human being, Beer’s VSM consists of three elements and five systems (Espinosa & Walker 2011) as seen in Figure 7. The three elements are: the ‘operation’ (denoted in Figure 7 as ‘O’), made up of units which perform the primary activities of the system (likened to the muscles and organs), the ‘meta-system’ (denoted as ‘M’) which ensures that the various operational units work together (likened to the brain and nervous systems) and the environment (denoted by
‘E’) (the parts of the outside world which impact on the system in focus) (Espinosa & Walker 2011).

Figure 7: The VSM: diagrammatic representation (Espinosa & Walker 2011, p. 43)

Each unit in the ‘operation’ is a viable system itself (e.g. a kidney (system) within a human being (a system)) referring to the principle of ‘recursion’ already mentioned. Merali and Allen explain that “the generic VSM template is replicated at all levels of detail within the nested structure: the organisation architecture is fractal in nature, displaying the self-similar VSM template at every level” (2011, p. 34-35). The VSM can thus be applied at each level of recursion, such as at an individual, then an organisation, supply chain, business network, industry, country level etc.

The ‘operation’ (O) and ‘meta-system’ (M) are then further sub-divided into five interacting systems, inspired by Beer’s contemplation of the ‘management’ of the muscles by the brain and nervous systems. These five systems in the model are aimed at ensuring that all the internal parts of the system work together and that the
internal parts work together with the external environment. The sub-systems referred to as ‘Systems 1-5’ take care of the primary function of the organisations, information and communication, governance, environmental monitoring, policy and strategy, respectively (Merali & Allen 2011).

The VSM proposes that an organisation is viable “if and only if it has this specified inter-related set of management functions embodied recursively at all levels of organisations” implying that if any sub-systems are absent or defective, the viability of the organisation will be compromised (Merali & Allen 2011, p. 35). The VSM has been widely used for organisational diagnosis and design and its fractal nature means that it can be applied at all scales to define the management structures of maintaining a cohesive organisational structure and identity (Merali & Allen 2011).

The VSM represents an ‘interventionist’ approach to complex systems, compared to for example CAS, which supports a bottom-up, emergent approach. Espinosa and Walker (2011) comment that they find that CAS offers little actionable principles, which leads them to favour the VSM approach. The VSM has been criticized for being too prescriptive and for neglecting to take into account non-rational behaviour of human actors and the emergent aspects of collective behaviours (Merali & Allen 2011). The VSM conforms to a design worldview where desired behaviours of complex systems can be brought about in a largely deterministic manner by management interventions on feedback loops. However, given that governments do try to intervene (e.g. through fines and environmental laws) in attempts to spread ES practices, the VSM application to sustainability (as discussed in the following section) is very relevant to the current study. The interventionist approach by governments has been deemed necessary in the case of ‘public goods’ and the ‘tragedy of the commons’ (Rogers 2003).

2.6.2.2 Application of VSM to sustainability

Espinosa and Walker (2011) argued that viability is a necessary condition for sustainability. They applied the VSM to sustainability at various system levels. They suggested that the societal transformation to bring about sustainability should be tackled at the following levels of recursion: global, continental, national, eco-regional, town/municipality, neighbourhood/community, family/household and
individual levels. They applied the principles of the VSM systematically and comprehensively to each level of recursion, starting with the individual and ending with the global. Espinosa and Walker concluded that there needs to be a new world paradigm where sustainability is paramount and that recursive, sustainable self-governance is needed. Further they contended that systems need to interact with their environment in a sustainable manner and organisations need to be designed based upon self-organizing, autonomous operational units.

Although the prescriptiveness and interventionist aspects of the VSM approach to sustainability is somewhat disconcerting, there are very interesting features of the model that may be applicable to the data in the current study. A key feature of the model is the concept of recursion i.e. systems within systems within systems. Linked to this is the notion that sustainability needs to be addressed at various levels of recursion, such as global, continental, national, eco-regional, town/municipality, neighbourhood/community, family/household and individual levels.

2.6.3 Combined IMP network and complexity science literature

There are a number of IMP studies incorporating complexity science concepts, both explicitly and implicitly. Explicit combined studies refer to studies which acknowledge both IMP network and complex systems approaches (Olaru, Denize & Purchase 2008; Olaru & Purchase 2010; Ritter, Wilkinson & Johnston 2004; Wilkinson 2008; Wilkinson & Young 2002, 2012, 2013; Purchase, Olaru & Denize 2014; Held 2010). In contrast, implicit combined studies denote IMP studies which refer to complexity science aspects without specifically labelling them as such. In fact the IMP network approach and complex systems approach are similar in a number of core principles, which is discussed in a section 2.6.3.3. Despite the combined studies and similarities between the principles of the two approaches, Wilkinson and Young (2013, p. 402) contended that there is “considerable resistance to complexity and associated simulation methods” in some marketing spheres.
2.6.3.1 Explicit combined IMP and complexity theory literature

There is a growing number of IMP studies explaining complex systems and how business networks can be understood using complex systems thinking, in particular CAS, as well as how to manage in CAS networks (Wilkinson & Young 2013; Olaru, Denize & Purchase 2008; Olaru & Purchase 2014; Held et al. 2014).

Olaru et al. describe business networks as:

“complex systems, made up of interdependent organisations whose managers are each trying to accomplish their own goals whilst simultaneously responding to the actions of others” (2008, p. 2).

Wilkinson and Young (2013) focus on the CAS school of complexity science and state that:

“[p]eople, households, firms, markets, supply chains, distribution systems, business relations and networks are all CAS interacting and adapting to each other” (p.395).

The CAS are ‘adaptive’ because the rules governing their behaviour are not fixed but instead evolve over time in response to the experience and outcomes occurring, as well as due to environmental effects. Wilkinson and Young (2013) highlighted the bottom-up, self-organising way in which order emerges in business markets arising from the actions and interactions of people, companies and other types of organisations involved. They advocated the use of a “complex systems science” framework for understanding and researching business markets (networks).

Understanding networks as complex systems suggests that management in complex systems “is not about directing and controlling others but more about responding and developing flexible, adaptive strategies” (Wilkinson & Young 2013, p.401) resonating with the optimal amount of structure in organisational complex systems discussed by Eisenhardt & Piezunka (2011) (please see section 2.6.1.6). The principle of requisite variety (attributable to Ashby, 1958) suggests that to cope and respond to its environment a system has to be able to match the complexity or variety of the environment. Wilkinson and Young (2013) referred to ‘soft-assembled strategies’ for management where managers do not need to take into account all the
direct and indirect interactions affecting outcomes explicitly. Rather, they advocated Kauffman’s ‘optimally myopic strategists’ since “if we become too clever in our strategizing we tend to transform the world in which we are adapting into one that is more chaotic” (Wilkinson & Young 2013, p.401).

To manage in networks second and third order ‘network effects’ need to be considered (Håkansson & Snehota 1995). The environment that an organisation operates in may be more or less complex. Certain aspects of the environment can be less complex and allow the organisation to follow more normative strategies (Wilkinson 2008). Wilkinson (2008, p. 265) recommended the use of agent-based models (ABMs) of business relationships and network development and evolution as CASs so as “to examine the role managers and government play in shaping patterns of development and evolution and to help design more effective intervention and participation strategies”. Although the methodology employed in the current study is not the use of ABMs, the purpose is nevertheless to further the understanding of the roles of management, government and other organisations in the patterns of spread of ES practices so as to inform more effective intervention and participation strategies.

2.6.3.2 Implicit combined IMP and complexity theory studies

Examples of the implicit use of complexity theory ideas within IMP literature are the IMP ‘path dependence’ studies (Harrison & Araujo 2000; Uusitalo & Grønhaug 2013; Håkansson & Waluszewski 2002b; Aastrup 2003), where ‘path dependence’ is considered as a school of thought in complexity science (Thietart & Forgues 2011). The notion of path dependence has been deployed within the industrial network literature largely to account for the stability and change of technological systems and to explain changes and evolution in networks (Harrison & Araujo 2000). Yet, these studies do not explicitly refer to ‘path dependence’ as part of complexity science. It could be argued that many more IMP studies implicitly refer to complexity principles, since there are many similarities in the core principles of IMP network theory and complex systems theory as discussed in the next section.
2.6.3.3 IMP network and Complex Systems Theory: a comparative analysis

IMP and complexity science theories appear to have a number of principles in common. This section discusses the similarities and differences between the principles of these approaches. The similarities are shown in Table 2.
Table 2: Similarities between the IMP network and complexity science (CS) principles

<table>
<thead>
<tr>
<th>Principle</th>
<th>Complexity science (CS) approach</th>
<th>IMP network approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network/system</td>
<td>CS refers to a complex <em>system</em>, made up of numerous interacting parts (Mitleton-Kelly 2003).</td>
<td>Similarly, IMP theory refers to a <em>network</em> where organisations (nodes) are interlinked by relationships (threads) (Håkansson &amp; Snehota 1995).</td>
</tr>
<tr>
<td>Interactions</td>
<td>CS highlights the interactions between the parts in the system (Mitleton-Kelly 2003).</td>
<td>Similarly, IMP network theory highlights the interactions between organisations (Håkansson 1982; Håkansson &amp; Snehota 1995).</td>
</tr>
<tr>
<td>Interconnectedness</td>
<td>CS contemplates the level of connections between the parts of a system, where some systems are more highly connected than others (Eisenhardt &amp; Piezunka 2011).</td>
<td>IMP theory contemplates the direct and indirect relationships between organisations in a network. The interconnectedness results in changes in one dyadic relationship being propagated to other dyads in the network (Håkansson &amp; Snehota 1995).</td>
</tr>
<tr>
<td>Context</td>
<td>CS highlights the importance of context e.g. initial conditions and environmental influences (Maguire, Allen &amp; McKelvey 2011).</td>
<td>IMP theory also highlights the importance of context, referred to as ‘atmosphere’ and ‘environment’ of relationships (Håkansson 1982), embeddedness (Håkansson &amp; Snehota 1995; Halinen &amp; Törnroos 1998) and environmental effects (Håkansson &amp; Snehota 1995).</td>
</tr>
<tr>
<td>Principle</td>
<td>Complexity science (CS) approach</td>
<td>IMP network approach</td>
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<td>----------------------------</td>
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<tr>
<td><strong>Emergence</strong></td>
<td>CS theory refers to the ‘emergence’ of macro system level behaviour and patterns which cannot be explained and predicted from the ‘sum of the parts’ (Mitleton-Kelly 2003). The sensitivity of complex systems to initial conditions is sometimes referred to as the “butterfly effect” after meteorologist Lorenz (1963) who claims that the flap of a butterfly’s wings in one region of the world could affect the weather patterns in others (Maguire 2011).</td>
<td>Similarly, the IMP approach refers to actions and reactions to actions and reactions to reactions to actions etc.; thus referring to multiple order ‘network effects’ (Håkansson &amp; Snehota 1995; Håkansson et al. 2009). The outcome of the multiple network effects cannot be predicted.</td>
</tr>
<tr>
<td><strong>Network horizons and pictures</strong></td>
<td>CS theory, such as CAS, envisages agents which do not have a global view of the system, but rather act based on simple rules and learning. “Without any part having a global view of the system or explicit coordination among parts, the parts can collectively give rise to system-level order which is not predictable from knowledge of the parts alone, through a process of upward causality” (Maguire 2011, p. 82).</td>
<td>Similarly, IMP theory suggests that managers cannot understand the whole network and the ultimate outcome of actions because of the multiple network effects (Håkansson et al. 2009). IMP theory suggests that managers will have more limited views of the network from their perspective (network horizons and network pictures) (Ford &amp; Redwood 2005). Every company is thus limited to its incomplete perspective of its and other’s positions and roles in the network.</td>
</tr>
<tr>
<td><strong>Levels of analysis</strong></td>
<td>Some CS literature points to systems within systems within systems i.e. levels of recursion (Espinosa &amp; Walker 2011).</td>
<td>Similarly, the ARA and other IMP models suggest that networks and relationships can be considered at various levels, such as the organisational, dyad and network levels (Håkansson &amp; Snehota 1995) and that processes can be viewed at the meta-, meso- and micro-levels (Halinen, Törnroos &amp; Elo 2013).</td>
</tr>
<tr>
<td>Principle</td>
<td>Complexity science (CS) approach</td>
<td>IMP network approach</td>
</tr>
<tr>
<td>---------------------------</td>
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</tr>
<tr>
<td>Feedback loops</td>
<td>CS theory discusses the effect of the top-down macro level behaviour on the parts of the system as well as the bottom-up processes of emergence. CS also contemplates positive and negative feedback loops (Merali &amp; Allen 2011; Maguire, Allen &amp; McKelvey 2011).</td>
<td>IMP theory highlights the effect that organisations’ actions can have on the network (where changes are propagated through the network) (Håkansson &amp; Snehota 1995) and the effects that the network can have on the organisation (Håkansson et al. 2009).</td>
</tr>
<tr>
<td>Management / control / structure</td>
<td>CS theorists suggest that the outcomes of a complex system cannot be controlled. However, management can try to make the environment enabling (Maguire 2011; Mitleton-Kelly 2003). Eisenhardt &amp; Piezunka (2011) suggest that partially connected systems of agents are higher performing than ones that are highly connected or highly unconnected. They explain that when parts of the system are over-connected, the system becomes gridlocked and cannot adapt to new opportunities.</td>
<td>IMP network literature warns of the futility of trying to control or manage a network, proposing that managers need to manage in networks (Håkansson et al. 2009; Ford et al. 2003; Håkansson &amp; Ford 2002).</td>
</tr>
<tr>
<td>Self-organisation</td>
<td>CS does not regard complex systems as being centrally organised but rather organising in a bottom-up process (Mitleton-Kelly 2003).</td>
<td>Similarly, core IMP literature suggests that no organisation can or should control a network, rather the network evolves due to the interactions between actors as well as environmental effects (Håkansson &amp; Ford 2002).</td>
</tr>
<tr>
<td>Principle</td>
<td>Complexity science (CS) approach</td>
<td>IMP network approach</td>
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</tr>
<tr>
<td>Far from equilibrium</td>
<td>CS describes complex behaviour arising at the ‘edge of chaos’ and of ‘dissipative’ equilibrium where the system keeps falling off the equilibrium (Eisenhardt &amp; Piezunka 2011).</td>
<td>Network literature suggests that the network is ever changing and can be at once static and changing (Håkansson &amp; Snehota 1995) and is never in a state of equilibrium (Araujo &amp; Brito 1998).</td>
</tr>
<tr>
<td>Co-evolution</td>
<td>Co-evolution refers to the system’s attempt to adapt or co-evolve with environmental changes.</td>
<td>Network literature highlights the influence of an actor in a network and the network on an actor (Håkansson &amp; Ford 2002).</td>
</tr>
<tr>
<td>Historicity and time</td>
<td>CS highlights the importance of time and history (Mitleton-Kelly 2003).</td>
<td>Similarly, IMP theory highlights the importance of time and history (Halinen, Medlin &amp; Törnroos 2012).</td>
</tr>
<tr>
<td>Path dependence</td>
<td>This is a school of thought in CS (Thietart &amp; Forgues 2011).</td>
<td>This notion has been used to describe how factors that have come into being can carry forward a particular direction of change through momentum (Håkansson &amp; Waluszewski 2002b).</td>
</tr>
<tr>
<td>Boundaries</td>
<td>Maguire (2011, p. 80) highlights that “distinguishing a complex system from its environment is, in the end, an analytic choice, i.e. determined by the purpose and perspective of the observer seeking to describe it.” Cilliers (2011, p. 150) concurs that “complex systems are open; their environment is co-constitutive of the system. It is often difficult, if not impossible, to determine the boundary of many systems.”</td>
<td>Similarly, deciding on network boundaries is equally contextual and dependent on the purpose of the analysis (Halinen &amp; Törnroos 2005).</td>
</tr>
</tbody>
</table>
2.6.3.4 Differences between the IMP network and complexity science principles

Notable differences include that IMP literature focuses on the dyad as the source, transmitter and recipient of changes as well as on the interactions at the dyadic level as the unit of analysis (Anderson, Håkansson & Johanson 1994). In contrast, complexity science does not focus in depth on the content and structure of dyadic relationships but rather on individual agents, the rules governing agents and the emergent macro-level behaviour.

2.6.3.5 Implications of the similarities and differences for the current study

The similarities between the CS and IMP principles appear to outweigh the differences, thus supporting the consideration of both in the current study. Also, the growing body of combined IMP / complexity science literature further supports the consideration of complexity science principles in the current study.

2.6.3.6 Synopsis of conceptualisations of spread from complexity science

The above review of complexity science literature provides many lessons concerning the spread of practices or changes in activities and activity patterns. Complexity science envisages changes occurring because of micro interactions between parts of a system and its environment which may result in macro-patterns, which cannot necessarily be predicted or understood by simple addition of the initial interactions. Complexity science highlights the importance of context (such as initial starting positions and environmental factors) and history on the changes in complex systems.

Wilkinson and Young (2012) advocated the use of the complex systems approach to understand network change. They contended that a different theoretical framework is needed compared to the linear, actor focused, comparative static, variables based and reductionist framework found in mainstream literature. They proposed the use of “nonlinear, network and context oriented, dynamic, process and mechanism-based holistic theories” such as that found in complex systems theory. Complex systems theory seeks explanation in terms of event sequences, processes and mechanisms (Wilkinson & Young 2012). Mechanisms and process refer to why and how events happen and can be thought of as the “verbs” of explanation and events as the “nouns” (Wilkinson & Young 2012, p. 8). The notions of mechanisms and processes are
integral to the current study and are also discussed in sections 2.4.1.10 and 3.3.5. Wilkinson (2008) suggested that network behaviour emerges from the network CAS as follows:

“The behaviour of a CAS depends on the way the parts are interconnected, not just the characteristics of the parts. No participant is in control. Instead, order and large-scale structures emerge in a bottom-up self-organising way from the micro interactions taking place among individual actors, as well as top-down as macro structures are recognised and responded to locally” (Wilkinson 2008, p. 195).

Complexity science suggests that processes of spread of ES practices may be viewed as macro system behaviour. To understand this macro process, the mechanisms and processes operating at the micro level need to be understood, together with the environmental influences and the characteristics of the actors operating at the micro level. The complexity approach suggests that unintended consequences of actions may occur; for example when government implements a programme to spread ES practices this activity is likely to interact with other activities and give rise to potentially unexpected and unforeseen consequences.

There is a vast range of approaches in complexity science – some researchers promote an interventionist view to achieve change in complex systems. For example, Espinosa and Walker (2011) advocated recursive levels of governance to bring about sustainability in complex systems. Other researchers advocated creating the optimal level of structure in a complex system to enable the system to adapt to changing environmental conditions (Eisenhardt & Piezunka 2011). Viewing business networks as complex systems offers the use of the IMP network approach and the potential explanations from the complex systems approach to gain more insight into the mechanisms and processes of spread of ES practices.
2.7 Conceptualisations of spread from the supply chain management (SCM) literature

The notion of ‘supply chain management’ (SCM) is concerned with ‘managing’ and bringing about (‘spreading’) changes in the supply chain which are aimed at benefitting the functioning of the supply chain as a whole. Thus, SCM practices fit into the ‘inter-organisation’ practices as contemplated in the current study. Environmental concepts have been integrated into the SCM literature since the 1980s (Handfield, Sroufe & Walton 2005) while sustainability and CSR aspects in supply chains have only emerged since the 1990s (Maloni & Brown 2006).

There is a growing body of ‘green SCM’ literature defined by Srivastava (2007) in his literature review as:

“integrating environmental thinking into supply-chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers as well as end-of-life management of the product after its useful life” (2007, pp. 54-55).

Rao (2002) differentiated green SCM practices from ‘environmental initiatives’ that companies undertake to improve their own environmental performance, compliance and competitive advantage. Rao is thus referring to the inter-organisation versus intra-organisation ES practices as defined in the current study.

The extensive list of green SCM practices contemplated in the literature range from arm’s-length to collaborative interactions (Zhu, Sarkis & Geng 2005; Vachon & Klassen 2006). Vachon and Klassen (2006) have broadly grouped green SCM practices into ‘environmental monitoring’ and ‘environmental collaboration’ categories where the former refers to activities by a buying company that use markets or arm’s-length transactions to evaluate and control its suppliers, while the latter describes activities where the buying company gets directly involved with its suppliers to jointly develop environmental solutions. This classification refers to the choice of management style in dealing with supply chains in general, ranging from coercive to collaborative.
Under the umbrella of green SCM literature is the green supplier development and green purchasing literature. Supplier development has been defined as:

“[a]ny effort of a buying firm with its supplier(s) to increase the performance and/or capabilities of the supplier and meet the buying firm’s short- and/or long-term supply needs” (Krause & Ellram 1997a, p. 21).

Bai and Sarkis (2010, p. 1201) regarded the practices available for green supplier development to be “as extensive as regular supplier development programmes since many of these traditional development programmes can be integrated with an environmental perspective.” Green supplier development practices differ from green SCM practices only in intention (Bai & Sarkis 2010). Bai and Sarkis (2010) cited the example of the practice of auditing suppliers’ environmental performance. This may only be for selection purposes (thus green SCM) or primarily to develop the supplier (thus green supplier development).

Some of the business network literature is critical of certain premises of supplier development, such as the premise that it is a one-sided activity (Ford et al. 2003). However, supplier development is commonly found in practice and need not be interpreted as a one-sided activity (Handfield, Sroufe & Walton 2005). It takes the response and at times cooperation and investment of both sides (buyers and suppliers) to bring about change (Krause & Ellram 1997b; Krause & Ellram 1997a; Hartley & Choi 1996).

Green purchasing practices, a further group of inter-organisation ES practices, have been investigated within the green SCM literature (Min & Galle 2001; Srivastava 2007), as well as from a purchasing literature perspective (Srivastava 2007). Green purchasing is defined as:

“an environmentally-conscious purchasing practice that reduces sources of waste and promotes recycling and reclamation of purchased materials without adversely affecting performance requirements of such materials” (Min & Galle 2001, p. 1223).

Green purchasing is mainly concerned with evaluation of suppliers’ environmental performance and mentoring to assist suppliers improve this performance (Rao & Holt
Examples of the use of green purchasing practices include Starbucks’ preferred supplier programme which rewards suppliers for environmentally and socially responsible practices and McDonalds’ incorporation of environmental factors into purchasing guidelines (such as water and energy conservation, air pollution, waste and recycling, habitat preservation and the use of chemicals) (Maloni & Brown 2006).

2.7.1 Conceptualisations of spread in SCM

Green SCM practices, green supplier development practices and green purchasing practices can be considered to be processes of spread as contemplated in the current study. In addition, there have been further theories regarding the process of spread in supply chains, such as the notions of supply chain contagion (McFarland, Bloodgood & Payan 2008) and environmental supply chain dynamics (Hall 2000), as discussed briefly in the following sections.

2.7.1.1 Supply chain contagion

Supply chain contagion refers to:

“the propagation of inter-firm behaviours from one dyadic relationship to an adjacent dyadic relationship within the supply chain” (McFarland, Bloodgood & Payan 2008, p. 63).

This theory can be viewed in combination with the large body of work on social contagion, which offers insights into the spread of practices and behaviour of individuals, see for example Burt (1987) and Valente (1996). The main mechanism of spread in supply chain contagion is imitation. McFarland et al. (2008) found that the way intermediaries treat end customers is significantly explained by an imitation of the way suppliers treated the intermediary. Their empirical investigation only included the supplier-intermediary and intermediary-customer relationships, and did not capture the full length of the supply chain. Thus, they have not investigated empirically whether the same process of spread (contagion) occurs in other relationships within the supply chain.
2.7.1.2 Environmental supply chain dynamics

Environmental supply chain dynamics (ESCDs) is defined as:

a “phenomenon where environmental innovations diffuse from a customer to a supplier firm” (Hall 2000, p. 455).

Hall (2000) found that ESCDs emerge when there is a channel leader with adequate power over their suppliers, suitable technical competencies, and under specific environmental pressure. Channel power refers to the ability of one channel member (i.e. an organisation within a supply chain) to control decisions of another (Hall 2000). The contribution of this theory is that both environmental pressures and supply chain pressures are needed to spread environmental practices in a supply chain. Thus, companies not only need the reasons to initiate an environmental supply chain, but also the capabilities to make them work (Hall 2000). The empirical work on ESCD did not extend beyond the buyer-supplier dyad and considered supply chains individually.

Hall’s (2000) empirical study found that Sainsbury supermarket in the UK had significant environmental pressure (since they are close to the end consumer and are a well-known brand in the UK), together with sufficient channel power and technical capabilities needed to influence the supply base. Sainsbury focused ES efforts on issues attracting public pressure and not on less environmentally glamorous items. In another case study of Hall, the company had technical competencies and channel power, but was not under environmental pressure and was distant from the end consumer, leading to no ESCD. Japan's biggest supermarket chain, Daiei, lacked channel power and an understanding of their supplier capabilities; they therefore lacked capability to initiate ESCD.

Hall (2000) suggested a link between pressure and the specific environmental issues addressed. He found that all supply chain initiatives could be traced back to the exposure of a specific pressure, either in reality, the potential thereof or the perception that the pressure existed. Hall contends that regulators should recognise that legislation is not the only mechanism generating change and that understanding other pressures and mechanisms can give increased leverage to limited government resources.
2.7.2 Combined green SCM and Diffusion of Innovations (DOI) literature

Zhu, Sarkis and Lai (2012) combined ecological modernisation theory, DOI theory and green SCM and identified three types of industrial manufacturers in China – namely early adopters, followers, and laggards – in relation to their adoption of green SCM practices, which is considered to be an environmental innovation. They found differences among these categories with respect to environmental, operational and economic performance. The following section considers the green SCM literature relating to the agrifood sector.

2.7.3 Green SCM literature dealing with the agrifood sector

Since the case study settings in the current study are the pork and dairy industries in the WA agrifood sector, attention was paid to green SCM literature dealing with this sector. Maloni and Brown (2006) developed a framework of supply chain CSR in the food industry. They looked at the USA food industry in particular, and highlight the importance of moving away from generalised statements of CSR to factors specific to particular industries. They identified the following dimensions of CSR in the food supply chain - animal welfare, biotechnology, community, environment, financial practices, health and safety, labour and procurement (Maloni & Brown 2006). They stated that while food safety has been found to be the primary concern of consumers regarding meat consumption, animal welfare is of increasing significance. Maloni and Brown suggested that retailers are starting to push more comprehensive standards down the supply chain e.g. food companies in the EU are adopting stricter requirements for labelling and traceability of genetically modified foods.

2.7.4 Combined IMP and SCM literature

A number of studies incorporate IMP and SCM approaches explicitly (de Lurdes, Macbeth & Purchase 2006; Brito & Roseira 2003). Most IMP studies acknowledge that supply chains are part of the network and implicitly refer to aspects of SCM. There were no IMP studies found drawing specifically on green SCM literature.
2.7.5 Synopsis of SCM conceptualisations of spread

The theories of spread of practices in supply chains (SCM, supplier development, green purchasing, supply chain contagion and ESCD) are similar in that they deal with dyadic relationships, while they differ in the mechanisms of achieving spread. The literature highlights the contextual factors influencing the adoption and spread of ES practices in supply chains, such as company size, closeness to end customer, capability and environmental pressures. The main criticism of these theories is that only dyadic relationships were investigated, thus the theories have not been contemplated for longer lengths of the supply chain.

Much of the SCM literature resonates with conceptualisations of spread from other bodies of literature. For example, supply chain contagion appears to be very similar to the notions of propagation of change in networks; although the supply chain conception is only linear and is limited to a dyadic relationship in one position in the supply chain. ESCD is similar to the network and complexity science focus on the importance of context on spread, highlighting the ‘environmental pressures’ on some organisations. The notions of bringing about changes in the supply chain through green SCM, green supplier development and green purchasing offer useful insights into the concept of spread of ES practices. However, these conceptualisations are linear along supply chains and provide only part of the picture being investigated in the current study. The following section considers the factors influencing spread arising from all the bodies of literature in more detail.

2.8 Factors influencing spread

This section considers the factors influencing spread emanating from the four bodies of literature reviewed. These ‘factors’ include a wide range of aspects such as the characteristics of the organisations, the characteristics of the practices being spread, the context in which the organisations, dyads and networks are positioned and events impacting the network.

As mentioned in section 1.3 there are various motivations and barriers influencing the adoption and spread of ES practices. Hall (2000) referred to ‘environmental pressures’ on organisations, such as consumer pressure. The literature points to the characteristics of organisations affecting the environmental pressure they face, such
as company size (Hall 2000). Other factors affecting the amount of environmental pressure on a company includes the company’s position in the supply chain, where environmental pressure was found to increase the closer the company is to the end consumer (Hall 2000).

IMP network literature discusses the factors influencing spread more generally as ‘exogenous and endogenous events’, ‘context’, ‘relationship atmosphere’, embeddedness and ‘environment’ (section 2.4.1.10). The DOI literature highlights that the nature of the social system and its degree of homophily and heterophily effects diffusion (2.5.1.2). Similarly, the structure of a network and a complex system were seen to impact spread. The DOI literature emphasises the effect that the characteristics of an innovation has on its diffusion (2.5.1.1) as well as the characteristics of social units in determining whether they will adopt an innovation (2.5.1.3).

Similar to DOI theory, the current study will consider whether the characteristics of ES practices affect its spread in terms of rate, extent (breadth and depth) and processes of spread. For example, whether legislated ES practices spread differently to voluntary ES practices, all else being equal. Another example is whether ES practices resulting in short-term net economic benefits spread different to those with long-term benefits.

Table 3 provides examples from the literature of characteristics of ES practices which may potentially influence their spread. It is proposed that groups of ES practices which have common combinations of characteristics may spread differently to practices with other combinations of characteristics. Many of these characteristics are borrowed from classifications found in the supplier development (Krause, Handfield & Scannell 1998), supply chain management (Hall 2000), quality control (Drury 2008), diffusion of innovations (Rogers 2003) and management accounting literature (Drury 2008), which have been adapted to the ES practice context.
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Legislated versus voluntary (Hall 2000).</td>
</tr>
<tr>
<td>b</td>
<td>Short-term versus long-term (or no) economic benefits (Drury 2008).</td>
</tr>
<tr>
<td>c</td>
<td>Preventative, appraisal, internal failure and external failure practices (Drury 2008).</td>
</tr>
<tr>
<td>d</td>
<td>Strategic versus reactive (Krause, Handfield &amp; Scannell 1998).</td>
</tr>
<tr>
<td>e</td>
<td>Independent versus cooperative (Håkansson et al. 2009).</td>
</tr>
<tr>
<td>f</td>
<td>Easy versus complex (Hall 2000; Rogers 2003).</td>
</tr>
<tr>
<td>g</td>
<td>Practices which attract public attention versus practices not necessarily seen by the public (Greenwashingindex.com 2012), also referred to as marketable versus non-marketable (Hall 2000).</td>
</tr>
<tr>
<td>h</td>
<td>Relative advantage (economic profitability, low initial cost, a decrease in discomfort, social prestige, a saving of time and effort, and immediacy of reward) (Rogers 2003).</td>
</tr>
<tr>
<td>i</td>
<td>Compatibility (Rogers 2003).</td>
</tr>
<tr>
<td>j</td>
<td>Trialability (Rogers 2003).</td>
</tr>
<tr>
<td>k</td>
<td>Observability (Rogers 2003).</td>
</tr>
<tr>
<td>l</td>
<td>Difficulty or intensity of ES practices (Sanchez-Rodriguez, Hemsworth &amp; Martinez-Lorente 2005).</td>
</tr>
<tr>
<td>m</td>
<td>Intra-organisation versus inter-organisation ES practices (Srivastava 2007).</td>
</tr>
<tr>
<td>n</td>
<td>Piecemeal / project based environmental practices versus whole of system environmental management (Lee 2010).</td>
</tr>
<tr>
<td>o</td>
<td>Practices related to public versus private goods (Chander, Drèze &amp; Lovell 2007).</td>
</tr>
</tbody>
</table>

Characteristic “a” distinguishes between ES practices required by law (e.g. statutory reporting requirements or correct disposal of dangerous chemical waste) and voluntary practices (such as voluntary sustainability reporting and adherence to packaging covenants). All else being equal, it is expected that the former may spread differently (e.g. more readily or through different processes) than the latter. Characteristic “b” relates to whether the economic benefits of implementation of the
ES practice occur in the short- or long-term. All else being equal, it is envisaged that ES practices resulting in short-term economic benefits are likely to spread more readily than those resulting in long-term benefits.

The characteristic of ES practices relating to preventative, appraisal, internal failure and external failure practices ("c") borrows from classifications in the quality control cost literature (Drury 2008). In the ES context, preventative practices include risk assessment and management practices, curbing pollution at the design stage, avoiding the use of problematic materials and ensuring compliance with laws. Preventative innovations are also contemplated in the DOI literature. Appraisal or monitoring practices are concerned with the administration of ES practices, such as practices to decide what environmental data to record, when, where, how often and where the data is to be stored. Internal failure practices refer to remedial ES practices implemented after an ES problem has occurred but before the issue has extended beyond the organisation’s borders, such as buying carbon credits for excess pollution and sorting out the effects of an ES disaster within the organisation. External failure practices refer to the cleaning-up practices required to remedy an ES problem which has already impacted outside the organisation’s boundary, such as the damage to the company’s reputation following an ES disaster. The spread of practices in item “c” may differ and depend on the organisation’s risk appetite concerning ES issues. A risk averse organisation may implement more preventative practices (hopefully resulting in less need for internal and external failure practices) (Drury 2008). In contrast, an organisation with a greater ES risk appetite may implement less preventative practices, which may result in more failure practices being required, all else being equal.

Characteristic “c” is one instance of the more general strategic/reactive distinction in item (“d”) which borrows from a classification used in the supplier development literature (Krause, Handfield & Scannell 1998). ES practices implemented strategically include those adopted to prevent ES disasters, mitigate risks or in anticipation of pending environmental legislation. Reactive ES practices refer to practices implemented in response to ES issues which have already occurred, such as an environmental disaster. It is submitted that strategic practices may spread less
readily than reactive processes, all else being equal. Also, the triggers of strategic practices are likely to differ from those of reactive practices.

Item “e” arises since some ES practices can be successfully implemented within the confines of a single organisation, for example monitoring and improving water consumption, while others require cooperation with other network members for implementation. For example, if a company wishes to document the full water footprint over the life-cycle of a product, data will need to be collected along many tiers in the supply chain. Another example is where an organisation wishes to ensure that their product is made of material that is fully recyclable. This would require that the components bought from suppliers comply with the specifications as well. It is submitted that independent practices are easier to implement and may spread more readily than cooperative practices.

The easy versus complex to implement distinction (“f”) refers to the difference between ES practices that are relatively simple to implement, requiring limited changes to the ordinary course of business, such as the use of more environmentally-friendly packaging materials, versus complex implementations, such as the use of an innovative ES technology in the product, as in hybrid cars. The easy to implement practices are likely to spread more readily than complex practices involving much knowledge and training and potentially the participation of multiple network members, all else being equal.

Item (“g”) relates to public awareness of an organisation’s ES practices. Certain organisations may wish to appear “environmentally friendly”, but may not be prepared to implement and spread deeply entrenched ES practices. Thus, such organisations may choose to implement the practices that target the most positive public image for a given amount of resources. Hall (2000) mentioned the example of Sainsbury (UK supermarket) focusing efforts on ES practices which resonate with consumers. An extreme case of the implementation of “ES” practices to gain a positive public image is the concept of “greenwashing.” Greenwashing occurs when an organisation “spends more time and money claiming to be “green” through advertising and marketing than actually implementing business practices that minimise environmental impact. It’s whitewashing, but with a green brush” (Greenwashingindex.com 2012).
Items (h) to (k) come from Rogers’ DOI work and have been discussed in section 2.5.1.1. Item ‘l’ refers to the difficulty of practices. This classification bears similarities to the classifications in the supplier development literature into basic, moderate and advanced practices (Sanchez-Rodriguez, Hemsworth & Martinez-Lorente 2005). In the ES context, some practices, which have been referred to as “low lying fruit” (Handfield, Sroufe & Walton 2005, p. 5), are easy and relatively inexpensive to implement, such as the use of more environmentally-friendly packaging. Then there is a middle range of ES practices, involving more onerous economic and human resources, such as educating suppliers. At the highest category level, more complex and costly practices are adopted, such as switching to clean energy suppliers and changing the design to meet environmental criteria. It is submitted that spreading the easiest ES practices is likely to occur more readily than spreading the highest, most difficult category of ES practices. A network with organisations exhibiting the most difficult ES practices may be considered to have achieved a greater “depth” of spread. Thus, the spread of ES practices needs to be considered in terms of both the extent (across the network) and depth (the efficacy and difficulty of the ES practices) of spread.

Item ‘m’ refers to the distinction discussed in section 1.2. Item ‘n’ refers to Lee’s (2010) call for a holistic rather than piecemeal approach to SCM, suggesting that piecemeal / project based approaches are more common. Item ‘o’ refers to the distinction discussed in Chapter 1. All else being equal, practices associated with private goods are likely to spread more readily than those associated with public goods.

Another consideration is that an ES practice is likely to have multiple characteristics from Table 3, some of which reinforce each other with regards to spread, while others may mitigate each other. Some characteristics may have more influence on spread than others. For example, although short-term benefits may be preferred to long-term benefits (all else being equal), the size and probability of the benefits of the ES practice are other important characteristics which may affect its spread. These characteristics of ES practices will be considered when analysing the data in the current study.
2.9 Initial conceptual framework

This section, which is based on the literature review, presents an initial conceptual framework designed to improve our understanding of the spread of ES practices. The key inputs from the various bodies of literature reviewed are summarised in Table 4, after which the initial conceptual framework is described.

Table 4: Inputs from the literature used in the initial conceptual framework

<table>
<thead>
<tr>
<th>Issue</th>
<th>Inputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processes of spread</td>
<td>The IMP Network literature</td>
</tr>
<tr>
<td></td>
<td>Importance of the <em>interaction process</em> in bringing about network change (Håkansson 1982);</td>
</tr>
<tr>
<td></td>
<td>Importance of <em>dyadic relationships</em> in spread (Halinen, Salmi &amp; Havila 1999);</td>
</tr>
<tr>
<td></td>
<td>Concept of <em>propagation</em> (Håkansson &amp; Snehota 1995);</td>
</tr>
<tr>
<td></td>
<td>Concept of unpredictable <em>network effects</em> (Håkansson &amp; Snehota 1995);</td>
</tr>
<tr>
<td></td>
<td>Spread through <em>issue-based nets</em> (Araujo &amp; Brito 1998; Brito 2001; Ritvala &amp; Salmi 2010; 2011);</td>
</tr>
<tr>
<td></td>
<td><em>Mobilisation</em> and <em>collective action</em> (Ostrom 2009; Ritvala &amp; Salmi 2010; Patala et al. 2014; Ryan, Kajzer &amp; Daskou 2012);</td>
</tr>
<tr>
<td></td>
<td>Importance of <em>government</em> actors (Håkansson &amp; Snehota 1995; Wilkinson 2008; Welch &amp; Wilkinson 2004);</td>
</tr>
<tr>
<td></td>
<td><em>Vertical</em> and <em>horizontal</em> propagation of change in activity chains (Håkansson &amp; Snehota 1995);</td>
</tr>
<tr>
<td></td>
<td><em>Parallel</em> and <em>sequential</em> processes (Halinen, Törnroos &amp; Elo 2013; Halinen, Medlin &amp; Törnroos 2012);</td>
</tr>
<tr>
<td></td>
<td>Spread as a process made up of <em>events</em> over time (Van de Ven &amp; Poole 2005; Halinen &amp; Törnroos 1998; Wilkinson &amp; Young 2013);</td>
</tr>
<tr>
<td></td>
<td>Different <em>levels</em> of analysis, context, processes and aggregation in networks (Halinen &amp; Törnroos 1998; Håkansson 1982; Håkansson &amp; Snehota 1995; de Lurdes, Macbeth &amp; Purchase 2006; Juho, Mainela &amp; Pernu 2010; Makkonen, Aarikka-Stenroos &amp; Olkkonen 2012; Halinen, Medlin &amp; Törnroos 2012);</td>
</tr>
<tr>
<td></td>
<td>Several <em>micro-level</em> processes may <em>create upper level</em> processes and vice versa (Halinen, Medlin &amp; Törnroos 2012);</td>
</tr>
<tr>
<td></td>
<td><em>Parallel processes</em> can occur at the <em>same or different levels</em> (Halinen, Medlin &amp; Törnroos 2012).</td>
</tr>
<tr>
<td>Issue</td>
<td>Inputs</td>
</tr>
<tr>
<td>-------</td>
<td>--------</td>
</tr>
</tbody>
</table>
| **Diffusion of innovations** | Concept of *change agents* – individual or organisation who influences innovation decisions in a direction deemed desirable by a change agency, using approaches from empathetic to coercive (Rogers 2003);  
Influence of *connectivity* (Rogers 2003);  
Concept of *critical mass* which occurs at the point where enough individuals in the system have adopted the innovation such that the adoption becomes self-sustaining and no longer needs change agent intervention (Rogers 2003);  
Role of *opinion leaders* who are members of the social system and influence others behaviour;  
Process of *modelling* and *imitation* of potential adopters of their near peers (Rogers 2003);  
Diffusion influenced by *homophily* – high degree of similarity in the social system. Also *strength of weak ties* (Granovetter 1973) and *heterophilius links or bridges* between homophilous cliques. |
| **Complexity science** | Concept of *emergence* of macro processes which are not equal to the sum of the underling processes (Mitleton-Kelly 2003);  
Upward and downward causality (Maguire, Allen & McKelvey 2011);  
*Recursive* organising structure – systems within systems within systems (Espinosa & Walker 2011);  
Sustainability needs to be addressed at various *levels of recursion* (Espinosa & Walker 2011);  
*Unexpected consequences* of policy in complex systems (Bankes 2011). |
| **Supply chain management** | Concept of *dyadic changes* along supply chain;  
Role of SCM practices;  
Supplier development practices;  
Green purchasing practices;  
Supply chain contagion (imitation) (McFarland, Bloodgood & Payan 2008);  
Environmental supply chain dynamics (need environmental pressure and supply chain capability) (Hall 2000);  
Spread often stops at first tier suppliers (Kovacs 2008). |
<table>
<thead>
<tr>
<th>Issue</th>
<th>Inputs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Other</strong></td>
<td>Public good argument suggests the importance of <em>government</em> in the spread of ES (Kotchen 2012; Rogers 2003); Role of government projects such as the Farming for the Future project (DAFWA 2010).</td>
</tr>
<tr>
<td><strong>Factors influencing spread</strong></td>
<td><strong>IMP Network literature</strong> Importance of <em>context</em> (Håkansson 1982; Håkansson &amp; Snehota 1995; de Lurdes, Macbeth &amp; Purchase 2006; Wilkinson &amp; Young 2013); <em>Multiple levels</em> of context (Håkansson &amp; Snehota 1995; Halinen, Törnroos &amp; Elo 2013; Makkonen, Aarikka-Stenroos &amp; Olkkonen 2012; Buttriss &amp; Wilkinson 2004); Importance of <em>trigger events</em> (Håkansson &amp; Snehota 1995; Hertz 1999; Dahlin et al. 2005; Havila &amp; Salmi 2000); Importance of <em>connectedness</em> (Håkansson &amp; Snehota 1995); Importance of <em>embeddedness</em> (Granovetter 1985; Halinen &amp; Törnroos 1998).</td>
</tr>
<tr>
<td></td>
<td><strong>Diffusion of innovations</strong> Network <em>connectedness</em> (Rogers 2003).</td>
</tr>
<tr>
<td></td>
<td><strong>Complexity science</strong> Sensitivity to initial conditions i.e. <em>context</em> (Maguire 2011).</td>
</tr>
<tr>
<td></td>
<td><strong>Supply chain management</strong> Environmental issues regarded as <em>peripheral</em> in organisations (Vachon &amp; Klassen 2006); <em>Trade-offs</em> (Handfield, Sroufe &amp; Walton 2005); Supermarkets are under environmental pressure by being in close contact with consumers and focus on issues attracting public pressure (Hall 2000); Supply chain initiatives linked to real or perceived <em>environmental pressure</em> (Hall 2000).</td>
</tr>
<tr>
<td><strong>Characteristics of ES practices affecting their spread</strong></td>
<td><strong>Diffusion of innovations</strong> <em>Characteristics of innovations</em> (such as relative advantage, compatibility, complexity, trialability and observability) influences the rate of adoption (Rogers 2003);</td>
</tr>
</tbody>
</table>
Issue | Inputs
--- | ---
Relative advantage is most important and includes factors such as economic profitability, low initial cost, a decrease in discomfort, social prestige, a saving of time and effort and immediacy of reward (Rogers 2003).

Supply chain management
Characteristics from quality control and management accounting literature (Drury 2008).

A description of the initial conceptual framework

Processes of spread

It was expected that multiple processes of spread would be found, occurring in parallel (i.e. simultaneously), as well as in series (i.e. sequentially over time) (Halinen, Medlin & Törnroos 2012; Halinen, Törnroos & Elo 2013). It was expected that the processes would not be independent, but may reinforce or mitigate each other (Halinen, Medlin & Törnroos 2012). Micro-level processes may also create upper level processes and vice versa (Halinen, Medlin & Törnroos 2012), following concepts of upward and downward causality (Maguire, Allen & McKelvey 2011). The ultimate outcomes of the processes are expected to be unpredictable, as in the concepts of ‘network effects’ (Håkansson & Snehota 1995) and ‘emergence’ (Mitleton-Kelly 2003). Processes were expected to be made up of events over time (Van de Ven & Poole 2005; Halinen & Törnroos 1998; Wilkinson & Young 2013). Thus, a process was defined as “a sequence of individual and collective events, actions, and activities unfolding over time and in context” (Pettigrew 1997, p.338).

The processes of spread were seen likely to occur at multiple levels, such as at an international, national, industry, supply chain or organisation level (Halinen & Törnroos 1998; Håkansson 1982; Håkansson & Snehota 1995; de Lurdes, Macbeth & Purchase 2006; Juho, Mainela & Pernu 2010; Makkonen, Aarikka-Stenroos & Olkkonen 2012; Halinen, Medlin & Törnroos 2012). The spread processes were seen as likely to occur horizontally across such levels, as well as vertically between levels (Håkansson & Snehota 1995). An example of horizontal spread is across Australia, or across an industry. The processes in horizontal spread were expected to
include supply chain management, diffusion of innovations and the concept of propagation. An example of vertical spread is where activities at an international level (such as international carbon emissions agreements) directly or indirectly led to spread at say an Australian level. Similarly, activities at an Australian level (such as legislation) were expected to spread to State levels. Vertical spread processes were seen as possible between all layers and in both directions (i.e. organisation to international and international to organisation). For example, the international committees concerned with climate change were expected to have an indirect effect on Australian organisations’ use of ES practices. Also, when there is enough groundswell at an organisation level about a particular issue in an industry this may be communicated to higher levels, which may lead to national regulations being implemented.

Spread processes are expected to occur through dyadic and group interactions, as shown graphically in Figure 8. The role of the interaction process (Håkansson 1982) in dyadic relationships (Halinen, Salmi & Havila 1999) was expected to be important, as is described in the process of propagation (Håkansson & Snehota 1995): where spread occurs through interactions within dyads that spread to other dyads. Supply chain management can also be viewed as a dyadic process which extends along supply chains. Imitation is expected to be a sub-process of some dyadic spread processes based on supply chain contagion (McFarland, Bloodgood & Payan 2008) and the importance of imitation in diffusion (Rogers 2003).

In addition to dyadic processes (shown in the bottom block of Figure 8), the literature also points to the role of groups of organisations operating on joint issues, such as the formation of issue-based nets (Araujo & Brito 1998; Brito 2001; Ritvala & Salmi 2010; 2011) and mobilisation and collective action (Ostrom 2009; Ritvala & Salmi 2010; Patala et al. 2014; Ryan, Kajzer & Daskou 2012). This is illustrated in the top block of Figure 8. Thus, overlaying the dyadic spread processes, some organisations may also participate in group processes of spread. This is shown in Figure 8, where, in addition to participating in dyadic processes of spread, organisations B, C, D, E, F and M may also be involved in interactions (shown by the triple arrow icon) in issue net 1.
Figure 8: Dyadic and group processes of spread
Such groups (e.g. issue-based nets) can represent groups of organisations or even groups of countries (e.g. country representatives at international climate change conferences). Such groups are expected to have synergistic impacts so that spread occurs more rapidly than would be the case if this was due solely to dyadic spread. Thus, it was expected that groups would play an important role in spread.

Government was expected to play an important role in spread (Håkansson & Snehota 1995; Wilkinson 2008; Welch & Wilkinson 2004), through actions such as setting national and State environmental laws and regulations, as well as developing joint government/industry projects, such as the Farming for the Future project. The need for government involvement was expected as many ES practices can be viewed as public goods. Government departments and industry representative organisations were also expected to be change agents (Rogers 2003).

If there was widespread use of ES practices in a network (e.g. industry, country), it was expected that “critical mass” (Rogers 2003) may lead to further self-sustaining spread, especially if some organisations are identified as opinion leaders, as conceptualised by DOI researchers. Given the dominance of the large supermarkets and their closeness to final consumers, it was expected that the supermarkets would take a significant role in green SCM (Hall 2000). There was an expectation that the large and powerful supermarkets would take a whole-of-supply-chain approach to ES, given this focus in the latest GRI 4 series sustainability reporting guidelines.

Factors influencing spread

Context (Håkansson 1982; Håkansson & Snehota 1995; de Lurdes, Macbeth & Purchase 2006; Wilkinson & Young 2013) was expected to be an important influence on processes. This included the “initial conditions” (Maguire 2011) often referred to in complex systems. Contextual factors were expected to arise at multiple levels (Håkansson & Snehota 1995; Halinen, Törnroos & Elo 2013; Makkonen, Aarikka-Stenroos & Olkkonen 2012; Buttriss & Wilkinson 2004) of aggregation, such as international, national, state, industry and organisation levels. For example, if an organisation is profitable or if an industry enjoys high margins, more spread was expected to occur. Contextual factors were expected to influence spread, although spread may, in turn, affect context. For example, if many organisations in an industry use ES practices, a high level of ES practices will be the norm in the industry, which
is a contextual factor affecting other organisations in the industry. These contextual factors are referred to in the framework as the “sea of context” surrounding organisations, industries, countries and so on.

The literature also emphasised that the structure of the network and the links between the organisations in the network affect the extent and processes of spread. The “connectivity” (Håkansson & Snehota 1995; Rogers 2003) of a network structure was expected to influence the extent of spread (Håkansson & Snehota 1995; Hertz 1999; Dahlin et al. 2005). Horizontal (across a network level) and vertical (between levels) embeddedness (Granovetter 1985; Halinen & Törnroos 1998) was expected to influence the processes of spread. The literature also highlights the role trigger events play in starting change sequences in networks (Håkansson & Snehota 1995; Hertz 1999; Dahlin et al. 2005; Havila & Salmi 2000). Hence trigger events were expected to be apparent in the data.

**Characteristics of ES practices that affect their spread**

The characteristics of the ES practices that were expected to affect spread are summarised in Table 3. Thus, they are not repeated here, even though they form part of the initial conceptual framework.

**2.10 Limitations of the literature review**

The current study is not concerned with the internal processes of an organisation involved in adoption of ES practices, so it is not concerned with practices inside the ‘nodes’ but rather the processes in the ‘threads’ or relationships between the nodes in a network. Also, as stated previously, the study is not concerned with the scientific efficacy of the ES practices.

**2.11 Chapter summary**

The Chapter has presented and discussed the theoretical foundation for the current study, namely the industrial network approach, together with the reasons for this choice. The conceptualisations of spread from the extant IMP network has been reviewed, while key insights regarding spread from the complexity science, diffusion of innovations and supply chain management literature have been discussed. The literature review culminates in an initial conceptual framework for understanding the
spread of ES practices in business networks. Next, the following Chapter discusses
the methodology employed in the current study.
CHAPTER 3 - METHODOLOGY

3.1 Introduction

Chapter Three discusses the choice of research philosophy, methodology, data collection, data analysis and theory building methods used in this study. Thereafter, the empirical setting of the case studies is discussed including how the challenges experienced were addressed. Ethics approval was received from the UWA Ethics Committee and the interview protocol used is presented in Appendix A. Before embarking on the detail of this Chapter, a brief summary of the most important points is provided as a guide.

3.2 A brief summary of the methodology used

Since the purpose of the current study was theory building and gaining an understanding of the processes of spread of ES practices, the research philosophy underlying the study may be classified as *interpretive*, as distinguished from a *positivist* research philosophy that focuses on theory testing. The focus is on *how* and *why* ES practices do (or do not) spread, which calls for *qualitative* research methods rather than quantitative research methods, as the latter method is better suited to *what* and *how many* type research questions (Carson et al. 2001). To this end, three network case studies were investigated in the Western Australia pork and dairy industries. Data was accessed by conducting 34 in-depth interviews and reviewing secondary data, including a 10 year review of the sustainability reports of the large Australian supermarkets (Coles and Woolworths) together with UK supermarkets (Tesco and Sainsbury) and Walmart in the USA as comparatives. The data for each of the three network case studies was organised as a systematic case history (Wilkinson & Young 2013) and an event-based method of analysis was undertaken using aspects of *narrative sequence analysis* (Buttriss & Wilkinson 2004, 2006) and *Event-based Network Process Analysis* (eNPA) (Halinen, Törmöros & Elo 2013), following *process research* methods (Halinen & Törmöros 2005). The empirical data was iteratively compared to the prior literature that was discussed in Chapter 2, so as to develop an understanding of the processes of the spread of ES practices in business networks (discussed in Chapter 6), using a *systematic combining (abductive)* approach (Dubois & Gadde 2002).
3.3 Research philosophy

Understanding the philosophical research stance is important, as it impacts on the perspective and approach to how research is practically conducted, how research problems are conceptualised and how data is gathered and analysed (Carson et al. 2001). The broad definitions and explanations of ontology, epistemology, methodology, positivism and interpretivism are shown in Table 5.

Table 5: Broad definitions and explanations of positivism, interpretivism, ontology, epistemology and methodology (Carson et al. 2001, p. 6)

<table>
<thead>
<tr>
<th></th>
<th>Positivism</th>
<th>Interpretivism</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ontology</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nature of ‘being’ and nature of the world</td>
<td>Have direct access to real world</td>
<td>No direct access to real world</td>
</tr>
<tr>
<td><strong>Reality</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reality</td>
<td>Single external reality</td>
<td>No single external reality</td>
</tr>
<tr>
<td><strong>Epistemology</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>‘Grounds’ of knowledge and relationship between reality and research</td>
<td>Possible to obtain hard, secure objective knowledge</td>
<td>Understood through ‘perceived’ knowledge</td>
</tr>
<tr>
<td></td>
<td>Research focuses on generalisation and abstraction</td>
<td>Research focuses on the specific and concrete</td>
</tr>
<tr>
<td></td>
<td>Thought governed by hypotheses and stated theories</td>
<td>Seeking to understand specific context</td>
</tr>
<tr>
<td>Methodology</td>
<td>Positivism</td>
<td>Interpretivism</td>
</tr>
<tr>
<td>-------------</td>
<td>------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Focus of the research</td>
<td>Concentrates on description and explanation</td>
<td>Concentrates on understanding and interpretation</td>
</tr>
<tr>
<td>Role of the researcher</td>
<td>Detached, external observer</td>
<td>Researchers want to experience what they are studying</td>
</tr>
<tr>
<td></td>
<td>Clear distinction between reason and feeling</td>
<td>Allow feelings and reason to govern actions</td>
</tr>
<tr>
<td></td>
<td>Aim to discover external reality rather than creating the object of study</td>
<td>Partially create what is studied, the meaning of the phenomena</td>
</tr>
<tr>
<td></td>
<td>Strive to use rational, consistent, verbal, logical approach</td>
<td>Use of pre-understanding is important</td>
</tr>
<tr>
<td></td>
<td>Seek to maintain clear distinction between facts and value judgments</td>
<td>Distinction between facts and value judgments less clear</td>
</tr>
<tr>
<td></td>
<td>Distinction between science and personal experience</td>
<td>Accept influence from both science and personal experience</td>
</tr>
<tr>
<td>Techniques used by researcher</td>
<td>Formalised statistical and mathematical methods predominant</td>
<td>Primarily non-quantitative</td>
</tr>
</tbody>
</table>

### 3.3.1 Ontology, epistemology and methodology defined

As can be seen in Table 5, research philosophies can be broadly categorised as positivist or interpretivist (columns 2 and 3) in terms of ontology, epistemology and methodology (column 1). Ontology has been referred to as the ‘reality status’ of the subject of study, epistemology as the ‘knowability’ of the subject of study and ‘methodology’ as applied ontology and epistemology (Schwartz-Shea & Yanow 2006). Put another way, “ontology is reality, epistemology is the relationship...
between that reality and the researcher; and methodology is the technique(s) used by the researcher to discover that reality” (Carson et al. 2001, p. 4).

3.3.2 Interpretivist versus positivist research philosophies

Carson et al. (2001) viewed various research philosophies as positioned on a continuum, with interpretivist-relativist and positivist-scientific philosophies at the two extremes. An interpretivist approach focuses on understanding what is happening in a given context (Carson et al. 2001). It allows for the presence of multiple realities, different actors’ perspectives, researcher involvement, taking account of the contexts of the phenomena under study, as well as the contextual understanding and interpretation of data. The current study falls within the interpretive arena, since the focus is on understanding the spread of ES practices in context, where various network actors’ perspectives are used to build up an understanding of the processes of spread.

The interpretivist ontology underlying the current study is based on the notion that the phenomenon under study (the spread of ES practices) is not objective, factual or singular in reality. Rather, the perception of the spread of ES practices may differ between actors in various network positions. The interpretivist epistemology in the current study holds the spread of ES practices can be understood through developing an understanding of the perceptions of the various actors in the network within the specific context of the empirical settings.

In contrast to the interpretivist philosophy used in this study, a positivist ontology considers the world to be external and objective (Carson et al. 2001). A positivist epistemology is based on the belief that observers are independent and that science is value-free. The positivist philosophy focuses on the facts or causes of social phenomena and explanations of causal relationships by means of objective facts. The role of researchers is to remain detached by maintaining a distance between themselves and the object of the research. Hypotheses are tested and statistics and mathematical techniques are used to process quantitative data. Such an approach is not adopted in the current study, as the purpose of the current study is to understand the multiple perspectives of spread and the interactions between organisations and between organisations and their context. Carson et al. (2001) argued that, although
the distinction between positivism and interpretivism may be clear at the
philosophical level, the distinction is less clear when it comes to the use of
quantitative or qualitative methods and to the issues of research design.

### 3.3.3 Qualitative and quantitative research methods

While the interpretive philosophy is often associated with qualitative research, the
terms are not synonymous (Schwartz-Shea & Yanow 2006). According to Schwartz-
Shea and Yanow (2006), the literature points to a methodological classification that
includes quantitative, positivist-qualitative and traditional qualitative methods. The
latter methods are increasingly referred to as ‘interpretive’ methods, although the
terms ‘constructivist’ or ‘constructionist’ methods are also used (Schwartz-Shea &
Yanow 2006). Newman and Benz (1998) suggested the notion of a
qualitative-quantitative research *continuum*, rather than a dichotomy of methods.

Qualitative research is described broadly as being multi-method and using an
Thus, qualitative researchers study phenomena in their natural settings and try to
interpret phenomena in terms of the meanings people bring to them. Qualitative data
refers to “detailed descriptions of situations, events, people, interactions, observed
behaviours, direct quotations from people about their experiences, attitudes, beliefs,
and thoughts and excerpts or entire passages from documents, correspondence,
current study used a case study methodology, which falls under the qualitative
research umbrella (Newman & Benz 1998).

#### 3.3.4 Inductive, deductive and abductive research approach

While research studies in the interpretivist paradigm are generally *inductive* (Carson
et al. 2001), the current study used the *abductive* approach (Dubois & Gadde 2002)
to theory building. The division between theory testing and theory building is
innately connected to the issue of using either a deductive or an inductive approach
to research (Carson et al. 2001). Deduction involves the development of a hypothesis
prior to its *testing* through empirical research methods. Induction allows observations
of the empirical world to guide the research and theory building. Carson et al. (2001)
suggest a balance of inductive and deductive approaches is most appropriate for
interpretive approaches to research and cite an example where a deductive conceptualisation is derived from a literature analysis and evaluated empirically and inductively to allow new insights to emerge. Dubois and Gadde (2002) suggested an alternative ‘balanced’ approach that used an abductive or systematic combining approach to case study research, which was used here.

Dubois and Gadde (2002) described the systematic combining or abductive approach as a process in which the theoretical framework, empirical fieldwork and case analysis evolved simultaneously. A key feature of the abductive approach is a continuous movement between the empirical and the model (theoretical) world (Dubois & Gadde 2002). There is a sub-process that ‘matches’ theory and reality and a sub-process of ‘direction and redirection’ within the study as new insights come to light. Dubois and Gadde (2002) suggested that, by constantly going ‘back and forth’ from one type of research activity to another and between empirical observations and theory, researchers can expand their understanding of theory and empirical phenomena. The systematic combining process begins with a preliminary analytical framework of articulated “preconceptions”. This framework is developed over time, based on findings in the empirical fieldwork, as well as through analysis and interpretation. Empirical observations might result in the identification of unanticipated, yet related, issues that may be further explored in interviews or by other means of data collection in a case study, thereby redirecting the study.

Dubois and Gadde (2002) argued the abductive approach is closer to an inductive than a deductive approach. The purpose of systematic combining is theory development, rather than theory generation (inductive) or confirmation of existing theory (deductive). Systematic combining builds more on the refinement of existing theories than on inventing new ones. This abductive approach was used in the current study to better understand the processes of spread of ES practices.

3.3.5 Process research

The current study was interested in the processes of spread of ES practices. Many IMP researchers have commented on the lack of guidance on research methods for dealing with the study of processes (process research) in industrial networks (Halinen, Medlin & Törnroos 2012; Elo, Halinen & Törnroos 2010; Makkonen,
Aarikka-Stenroos & Olkkonen 2012; Halinen, Törnroos & Elo 2013; Pressey et al. 2011). To answer this call, a growing body of IMP studies has addressed such methodological issues (Halinen, Medlin & Törnroos 2012; Elo, Halinen & Törnroos 2010; Makkonen, Aarikka-Stenroos & Olkkonen 2012; Bizzi & Langley 2012; Chou & Zolkiewski 2012; Halinen, Törnroos & Elo 2013; Araujo & Easton 2012).

Halinen et al. (2012) recognised the challenges of process research in business networks, such as the multiple levels that need to be considered in nested network structures, which adds complexity to such research. This is further complicated by the possibility of multiple processes evolving in parallel, where multiple micro-level processes may create upper level processes and vice versa, and several processes may evolve in parallel at the same level of analysis. Halinen et al. (2012) also highlighted the difficulty in identifying the root causes and events of importance to processes and complications that arise when considering multiple actors’ views of processes. The definition of process, the use of an event-based approach, the definition of events, classification of events and levels of processes were discussed in section 2.4.1.11. The following sections explain how events were identified in this study and how they were used to understand the processes of spread.

### 3.3.5.1 The identification of events

A flexible approach was taken to identifying events relevant to the spread of ES practices. The ‘relevance’ of events was allowed to emerge throughout the data collection and analysis. Relevance was based on the interviewees’ perceptions of the events, as well as the researcher’s interpretation and triangulation of data that was done through a ‘double sense-making process’ in which managers made sense of the events and the researcher made sense of the managers’ sense-making (Halinen, Törnroos & Elo 2013).

### 3.3.5.2 The use of events in analysis of processes and network change

Events have been used by IMP researchers through a number of analysis methods when studying processes in business networks, such as the narrative sequence approach (Buttriss & Wilkinson 2004, 2006; Bairstow & Young 2011, 2012; Huang 2010; Makkonen, Aarikka-Stenroos & Olkkonen 2012) and Event-based Network Process Analysis (eNPA) (Halinen, Törnroos & Elo 2013; Elo, Halinen & Törnroos
This study used aspects of these methods. Consequently, these approaches are described and contrasted.

**The narrative sequence approach**

Narrative sequence methods (Buttriss & Wilkinson 2004, 2006; Bairstow & Young 2011, 2012; Huang 2010) are suggested to analyse changes in industrial networks and to develop process change models (Buttriss & Wilkinson 2006). Narrative sequence techniques fit into the IMP philosophy that business behaviour emerges over time because of interactions between organisations. These methods allow for the inclusion of a temporal dimension, which was critical for the current study, as Buttriss and Wilkinson (2006) have suggested ‘snap-shot’ methods are inappropriate for developing theories of change within dynamic business networks.

The analysis involves mapping and analysing sequences of events and their interrelations. The method requires the identification of underlying mechanisms or generative processes in which “the aim is to account for the way actions and events are interconnected over time, how one thing leads to another through the operation of these forces” (Buttriss & Wilkinson 2006, p. 161). Wilkinson and Young (2013, p. 399) suggest mechanisms underlie the dynamics and evolution of networks and the mechanisms “work together over time, in ways that are not yet well understood, leading to the emergence of macro outcomes, structure and processes in terms of types of relationships, network structures, performance and broad patterns of change and evolution.” Mechanisms are, thus, regarded as processes that bring about change (Buttriss & Wilkinson 2014).

In the narrative sequence method, the sequences of interconnected events are considered at different levels of aggregation, ranging from organisation, industry, network or nation level on the one hand, to individual behaviour and cognition on the other (Buttriss & Wilkinson 2006). The current study was concerned with ‘levels’ and allowed the ‘levels’ to emerge from the data. Buttriss and Wilkinson (2006, p. 162) noted the “challenge is to link causal mechanisms operating at different levels of aggregation to show how macro-processes and outcomes emerge from, or are at least consistent with, micro-level processes and interactions.” This study considered
the relationships between processes and events at multiple levels, but avoided the use of the word ‘causal’, preferring the terms ‘connected’ and ‘related’.

Buttriss and Wilkinson (2006) discussed three main stages of narrative sequence analysis. The first consists of identifying and classifying the kinds of events taking place. The current study was flexible about the identification of events and simply focused on whether an event was ‘relevant’ or irrelevant to the processes of spread. The second stage involves identifying the sequences of events that occur over time and how they are or are not connected. The sequences may occur in series (one event following on from another event over time) or parallel (events occurring simultaneously) (Buttriss & Wilkinson 2004). The last stage consists of identifying the causal mechanisms that drive the flow of events.

The idea of causal explanations and mechanisms (Easton 2002; Elster 1989; Hedström & Ylikoski 2010) builds on the concepts of social mechanisms (Hedström & Swedberg 1996). Studies of social mechanisms are concerned with developing “middle range theories” and are an intermediary level of analysis bounded by pure descriptions and story-telling on one hand and universal social laws on the other. Mason, Easton and Lenney (2013) also investigated the use of the Causal Social Mechanisms approach to help researchers working across multiple ontologies in business network research.

As already mentioned, the use of ‘causal’ was avoided here because of the ontological stance taken in which multiple realities are possible. An example of a portion of a global narrative map arising from narrative sequence analysis is shown in Figure 9.

Figure 9 was developed by Buttriss and Wilkinson (2004) in their analysis of the evolution of e-business in the Commonwealth Bank of Australia. Time is shown running down the figure in the first and last columns. The black circles represent events. Lines connecting events (circles) show events leading on from other events (series), while other events run in parallel (in the same row i.e. a cross-section of time). The column headings show the analysis of event sequences from various actors’ perspectives or level (‘firm’, ‘relationship/network’ and ‘environment’). Arrows-in indicate a prior history of relevance to the actor. Dotted lines group
various events that, together, represent higher more abstracted events (labelled e1 to e7). A new global narrative can then be constructed explaining the critical junctures in the path taken.

Figure 9: Global narrative map (Buttriss & Wilkinson 2004, p. 12)

The principles of such a narrative map were used here; such as organising data sequentially over time, categorising events at multiple levels, grouping events into more abstracted, higher events and considering sequences of events in series and parallel. However, the number of processes and sub-processes together with the complexity of the interactions between events, processes and the factors influencing the processes necessitated the use of narrative tables, rather than narrative maps. Narrative sequence analysis requires a researcher to develop systematic case histories. Wilkinson and Young (2012) suggested systematic case histories can be used together with agent-based models to study network processes and evolution, which is an area for further research. They argued ‘mechanisms’ and ‘process’ refer to ‘why’ and ‘how’ events happen and as the “verbs” of explanation, while ‘events’ are the “nouns” (Wilkinson & Young 2012, p. 8).
Event-based Network Process Analysis (eNPA)

Halinen et al. (2013) suggested the eNPA approach to network process analysis, based on their prior work (Elo et al. 2010). They argued events take place at different levels in a network and environment; differentiating macro-, meso- and micro-level events, as well as endogenous and exogenous events. eNPA provides analytical tools, such as moving between real time and retrospective analysis, distinguishing between ‘influencing factors’, ‘critical events’ and ‘resulting changes’ within processes, and the notion of ‘event trajectories’. The influencing factors are analysed from the three levels of business context (i.e. macro-, meso- and micro-level).

Halinen et al. (2013) discussed the difficulties of process research in industrial network settings, including distinguishing critical events from resulting changes and influencing factors from events. This is complicated by influencing factors often working in constellations rather than in isolation. Also, more than one critical event may often occur in parallel to each other. Halinen et al. (2013) suggested flexibility in data collection and analysis, recognising the role and significance of events may only emerge from the research process and in combination with other events and processes. They suggested a researcher’s analysis of events (i.e. double sense-making) counterbalances changing interpretations and different accounts of the process by various participants.

The advice about flexibility was heeded here and events were not categorised except as ‘relevant’ or irrelevant to the processes of spread of ES practices. The current study identified ‘influencing factors’, as in eNPA, but in more generalised terms, rather than the specific factors leading to specific ‘critical events’, as in eNPA. The study used the idea of ‘levels’, as in eNPA and narrative sequence analysis. The reason for the adoption of a very flexible approach to ‘events’ was that there were numerous processes of spread occurring simultaneously and at multiple levels of aggregation. Further, relevant events are at times directly and at other times indirectly related to the outcomes of the processes of spread. Also, the current study considered micro- as well as more macro- processes of spread, in which processes may be made up of further processes (discussed in Chapter 5 and Chapter 6); thus requiring flexibility in the identification of relevant events.
The concept of ‘event trajectory’ in eNPA shows the flow of events over time and at various levels of context. Event trajectories can be represented graphically with ‘context levels’ on the y-axis and time on the x-axis, with events plotted in the space connected by arrows. Event trajectory is an attempt to select the most significant events in context at different levels and in various parts of the network or business environment, so as to understand the process taking place. Event trajectory allows a more holistic approach to events, analysing them in a broader timeframe and contextual setting (Halinen et al. 2013). The sentiment of event trajectories was used here, but the processes were not explicitly analysed to this micro-level of events.

The eNPA approach does not use the term ‘causality’, but uses arrows in the depiction of event trajectories to indicate logical and context-specific connections in the data. Effects are seen to travel both ways along arrows in event trajectories as current events may be logically linked to expected future events as well as to past events. The current study used this approach when contemplating relationships between events, avoiding the use of the term ‘causality’.

Halinen et al. (2013) found there were temporal and logical links between network events and that events may have various durations of impact. They did not find a deterministic path nor causality or path dependence. Rather, their study highlighted the context-specific nature of event trajectories and allowed for the presence of competing event trajectories. The current study also explored competing explanations of the connections between events.

The eNPA approach was developed using a moderate social constructionist view combined with the sense-making of events (Halinen, Törnroos & Elo 2013). eNPA is an alternative to network pictures, social network analysis and the narrative (sequence) approach. It is a descriptive, rather than prescriptive approach that produces rich idiographic descriptions of network processes, rather than general explanations of events or process (such as found in narrative sequence research) (Halinen, Törnroos & Elo 2013). The current study used many aspects of eNPA.

**Other event-based approaches to process research**

Makkonen et al. (2012) took a narrative approach to industrial network process research. They showed how researchers move from informants’ narratives of a
process, to groups’ narratives of the process, to reviewers’ narrative of the process, to a theoretical narrative and conceptualising of the process and then follow the cycle again. The narrative method searches for triggers and reasons for processes and causal pathways between focal events and their contexts (Makkonen, Aarikka-Stenroos & Olkkonen 2012).

Makkonen et al. (2012) see network processes as the outcome of the activities of many actors. Contextual events form part of the context in which actors in a network perceive and interpret, whereas focal events are the outcomes of network actors’ collective actions. Makkonen et al. (2012) suggested a meta-framework of network processes. They suggested three context levels (macro-network, meso-network and micro-network), each having their own structural properties and contextual events.

The *macro-network* is the highest level and refers to the network as a whole (e.g. the political and economic systems of a single country or coalition of countries). Macro-level structural properties include cultural norms and values as well as legislation and political systems. Macro-level contextual event examples include changes in legislation or regulations and the collapse of political or economic systems. The *meso-network* level refers to, for example, industry level nets. Meso-network structural properties include competitive and technological properties, shared beliefs in network strategies and relationship atmosphere. Meso-network contextual event examples include changes in network power positions, the dissolution of central network dyads or a change in dominant technologies. The *micro-network* level represents intra-organisation nets in and between departments, functions or other organisational units. Their structural properties include a company’s vision, mission and strategy as well as marketing and purchasing strategies. Micro-network level contextual event examples include personnel changes and changes in business strategy and purchasing policy.

The current study incorporated aspects of Makkonen et al.’s (2012) conceptualisation of network ‘levels’, but avoided the reference to ‘causal pathways’. The eNPA and narrative sequence analysis methods described previously were more closely followed here than was Makkonen et al.’s approach.
Comparing the above analysis methods

The analysis methods discussed here have some similarities and some differences. All of the methods emphasise the important role of context and time in understanding network processes, which was incorporated in the current study. All of the methods recognise the multiple levels in networks that were also integrated in this study. All of the methods recognise processes can occur in series and parallel. The methods recognise the difficulties of handling the interconnectedness between relationships and events and identifying influencing factors from events and the outcomes of events. However, there are differences in their view on causation between events. The narrative sequence and Makkonen et al.’s (2012) methods use the term ‘causal’ to describe connections between events, while the eNPA prefers terms such as ‘logical connections’ between events. The current study did not use the term ‘causal’ and followed the eNPA’s use of ‘connections’ between events due to the epistemological approach chosen, in which multiple actors’ perspectives were sought and multiple realities and connections between events were possible.

3.4 The case study methodology

3.4.1 Definition

Yin (2009, p. 18) defined a case study as:

An empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.

Piekkari, Plakoyiannaki, and Welch (2010, p. 112) defined a case study similarly as:

An empirical inquiry that investigates a phenomenon in its real life context, relating it to theory and seeking to understand what the empirical phenomenon is a case of in theoretical terms.

In the context of network research, Halinen and Törnroos (2005, p. 1286) defined a case strategy as:
An intensive study of one or a small number of business networks, where multiple sources of evidence are used to develop a holistic description of the network.

These definitions show the context-specificity of case studies and the detailed empirical evidence required. Piekkari et al. (2010) highlighted the need to relate empirical case study findings to theory. The current study used an abductive approach to this end. The definition of a case strategy in a network context emphasises the need to obtain multiple sources of evidence to develop a holistic perspective, which was followed in the current study.

3.4.2 Reasons why a case study method was chosen

The literature highlights the importance of context in the adoption and spread of ES practices (Hall 2000) and context-specificity has been found to be a characteristic of network research in general (Halinen & Törnroos 2005). The importance of context supported the use of the case study method here. Further, the current study was concerned with the processes of spread of ES practices, which needed to be considered over time, rather than at a point in time. Eisenhardt (1989) suggested case studies have the potential to capture the dynamics of studied phenomena, supporting its use in the current study. Halinen and Törnroos (2005) also argued the case method is appropriate when studying change processes, as it allows the study of contextual factors and process elements in the same real-life situation. Thus, the case method suited the current study, which was concerned with the processes that result in changes in practices and behaviour, being the adoption/non-adoption and spread/non-spread of ES practices over time and in context.

Yin (2009) suggested case studies should be preferred (1) when considering ‘how’ and ‘why’ questions, (2) where the researcher has little control over events and (3) when the focus of the research is on a contemporary phenomenon in a real-life context. The research questions and objective in this study met these criteria, as they (1) focused on ‘how’ and ‘why’ ES practices spread in networks, (2) they related to events not under the control of the researcher and (3) they focused on the processes of spread of ES practices within the real-life context of business networks.
Also, case analysis is well established as a theory development method (Welch 2000; Halinen & Törnroos 2005; Dubois & Gadde 2002), which was the overarching objective of the current study. Further, the use of qualitative case studies is a well-established IMP approach through which to develop theories about business networks (Welch 2000; Dubois & Gadde 2002; Halinen & Törnroos 2005), which created a precedent for its use here. Dubois and Gadde (2002, p. 555) argued “case studies provide unique means of developing theory by utilising in-depth insights of empirical phenomena and their contexts,” making this method appropriate for the current study that was concerned with developing an understanding of spread. Halinen and Törnroos (2005, p. 1286) concluded a “case strategy is most suitable for the study of business networks. It allows the study of a contemporary phenomenon, which is difficult to separate from its context, but necessary to study within it to understand the dynamics involved in the setting.”

3.4.3 Research design

A multiple embedded case study design was used. The multiple case study method was chosen (3 network case studies) in light of Yin’s (2009) suggestion that, when possible, multiple cases are preferred over single case designs. He suggested that even a two case study is likely to be better than a single case design. Halinen and Törnroos (2005) also suggested comparing cases offers the potential for improved explanatory power and generalisability; while acknowledging the difficulty of comparing network cases due to their context-specificity and historical backgrounds. Multiple case studies have analytic benefits and provide the possibility of direct and theoretical replication (Yin 2009).

3.4.3.1 The unit of analysis

The unit of analysis or ‘case’ was a business network. Prior network research highlighted the difficulties in setting the boundaries around a network and differentiating a network from its context (Halinen & Törnroos 2005; Chou & Zolkiewski 2012). Anderson, Håkansson and Johanson (1994, p. 4) argue “the network setting extends without limits through connected relationships, making any business network boundary arbitrary.” Since the objective of the study was to gain a holistic understanding of the processes of spread, the networks chosen needed to be
extensive. The presence of long supply chains was also seen as desirable so as to gain the perspectives of organisations in various supply chain positions. The networks also needed to have various types of organisations, such as government organisations, industry representative organisations, green specialist companies, not-for-profit companies and for-profit companies, so as to gain the perspectives of these actors. Further, a desired characteristic was that ES was important so it was likely ES processes had spread or were spreading. Also, as the literature review pointed to the importance of ‘levels’, the network needed to be extensive enough to allow for a holistic perspective to be gained at multiple levels of aggregation.

3.4.3.2 Time frame investigated

The researcher did not want to limit the history used to understand the spread of ES practices over time. However, while the histories offered by interviewees and secondary data were considered, where more detailed analysis was concerned (such as the review of sustainability reports), the focus was on the 10 years up to the time of the study (i.e. 2004-2013), due to logistical considerations.

3.4.3.3 The networks chosen for case studies

Based on the criteria outlined in section 3.4.3.1, the networks were chosen from the WA agrifood sector, as was discussed in section 1.13. The agrifood sector appeared to be a suitable empirical setting as it is an important WA sector (second only to the mining sector in the State) and it trades internationally on its ‘clean and green’ reputation in the Australasian region (DAFWA 2009), which suggested ES practices had been taking place and were important to the sector. Further, the agrifood supply chains are long, including farmers and their suppliers, food processors, food retailers, customers and end-of-life organisations (e.g. waste and recycling organisations). Within the agrifood setting, two network case studies were initially sought, which turned out to be the pork and dairy industries, as is described in the next section. In addition to the two network case studies, a third embedded case study emerged from the data in the pork industry that related to the spread of a group of practices (sow stall free practices), as discussed in section 3.4.4.3. Thus, there were three network case studies, two relating to the WA pork industry and one to the WA dairy industry.
3.4.3.4 Choice of interviewees

The plan was to investigate the spread of ES practices in two network case studies within the WA agrifood sector. A desktop review of the WA agrifood sector, industries, government and other organisational websites, ES legislation and other documents (such as sustainability reports) was undertaken to better understand who the actors were in the WA agrifood network in relation to ES. Preliminary interviews were conducted with government officials from the WA Department of Agriculture and Food (DAFWA) and an agrifood sector researcher at a local university to gain an overview of ES in the WA agrifood sector and a list of potential food processors who might be suitable participants. Food processing companies were targeted as focal companies from which directly and indirectly related organisations radiating from these focal companies were sought using a snowball technique (where an interviewee was asked for further relevant parties to interview).

This process led to case study A1 which was the spread of ES practices in the WA pork industry network surrounding OrgA, a significant WA pork processing company and a large WA agrigroup. Using the snowball technique mentioned already, directly and indirectly related organisations around OrgA were identified and interviewed where possible, which resulted in a comprehensive case study of the spread of ES practices in the WA pork industry. When building up the interviews of organisations related to OrgA, the researcher was mindful of ensuring perspectives were gained from the various types of organisations in the WA pork industry, including more indirectly related organisations, such as government departments. Hence the researcher tried to ensure perspectives were obtained from farmers, other food processors, food retailers, industry representative organisations, food distribution companies, green specialist companies, not-for-profit organisations, environmental specialist organisations and various governmental departments at the local, State and federal government levels, to try to capture a holistic perspective of spread in the WA pork industry. Thus, perspectives from multiple organisations in diverse network positions were obtained; thereby not privileging the perspective of the focal company above other network actors.

The actors relevant to the processes of spread of ES practices at the WA pork industry level were based on interviewees’ perceptions of relevant actors, as well as
the researcher’s review and interpretation of the interviews and documents; following the double sense-making perspective suggested by Halinen et al. (2013). To assist in the identification of the main actors, sources of evidence were triangulated and interview data were triangulated to see whether interviewees perceived the same organisations as key ES actors in the WA pork industry.

As case study A1 progressed the issue of sow stall free practices was found to be very topical as it was brought up spontaneously by interviewees. A preliminary analysis of the data suggested the spread of sow stall free practices showed processes distinct from the spread of general ES practices and a decision was made to look at these practices as a separate, embedded case study (A2), as is discussed further in section 3.4.4.3.

Data from a second industry case study was needed to allow a cross-case comparison of the processes of spread of ES practices. Hence, a second industry network was sought. The WA dairy industry was considered a good comparative case study, as it met the desired criteria outlined in section 3.4.3.1. Dairy processors and manufacturers were targeted to obtain a focal company. Representatives from two of WA’s four main dairy processors were interviewed, together with directly and indirectly related organisations where possible, providing the data for case study B.

3.4.4 Collecting case study evidence

The case study evidence was mainly sourced from interviews and documents. Data collection followed Yin’s (2009) three principles, namely the use of multiple sources of evidence (perspectives from various organisation types, interview and documentary data), the creation of a case study database of evidence and the maintenance of a chain of evidence that linked the original questions asked, the data collected and the conclusions drawn.

3.4.4.1 Interview procedures

The interviewees were chosen as described in section 3.4.3.4. Interviews were sought with high level managers familiar with their organisation’s ES issues or with interviewees recommended in prior interviews. Targeted interviewees were emailed to briefly explain what the study entailed and to request an interview. Where
appropriate, the emails explained who had recommended the interviewee be contacted, to try to increase participation by showing participants they had been recommended by someone they knew. Prior to each interview, the interviewee and the organisation they represented were investigated through a desktop review of organisation websites, documents and newspaper articles. Before commencement of the interview, interviewees were asked if they consented to the interview being recorded and transcribed. It was explained the data would be kept anonymously as required by UWA ethics procedures. The interviewees were asked to sign an interviewee consent form that outlined what the study was about and that the data could be kept anonymously. The interviews were semi-structured, loosely following the interview protocol shown in Appendix A. Many questions were open ended, such as asking the interviewees to explain their organisation’s approach to ES. By leaving the interview questions open ended, unexpected issues came up that were then discussed further and included in future interview preparation and interviews.

The initial interviews were conducted in late 2011. Approximately half of the interviews were completed by late 2012. The remaining half was conducted in the first half of 2013. The average interview lasted 38 minutes (ranging from 20 minutes to 105 minutes). When further interviews suggested a saturation of information it was decided there was sufficient data.

The interview data was transcribed by the researcher using the ‘Dragon speak’ tool for initial transcription, which was checked and corrections made. The interview recordings were listened to a third time and remaining corrections made. The transcripts were then emailed to interviewees who were encouraged to contact the researcher with any corrections. Care was taken to keep data anonymous and confidential so interviewees and later readers could not identify who said what, especially as the WA pork and dairy industries are relatively small.

3.4.4.2 Documentary data

Welch (2000) suggested the use of archival data in combination with interview data in business network case studies. Archival analysis takes time into account and can lead to insights about antecedent conditions, the role of history, relationship dynamics, the evolution of network structures and processes as well as relationship
life cycles. To this end, evidence was sourced from environmental laws and regulations relevant to the WA pork and dairy industries and the WA agrifood network, trade press, environmental policies on organisation websites, financial statements, sustainability reports and newspaper articles.

Some interviews provided leads that required further documentary investigation, such as following up statements by searching for related newspaper articles. Given the power and influence of the large supermarkets (Woolworths and Coles) in the WA agrifood sector, as indicated by interviewees and the media, it was imperative to understand their role in the spread of ES practices. This was accomplished by a focused review (i.e. concentrating on aspects relevant to the current study’s research questions and objective) of the supermarkets’ sustainability reports over the ten year period from 2004 to 2013, together with a review of the sustainability issues on the website of a further significant food retailer in WA (the IGA independent chain of supermarkets, which has Metcash Ltd as marketer and distributor). The sustainability reports of comparative UK and USA supermarkets were also reviewed.

**Ten year review of supermarket sustainability reports**

Coles and Woolworths have comprehensive and independently assured sustainability reports (SRs) and all three large Australian supermarkets (Coles, Woolworths and IGA) have comprehensive sustainability information on their websites. Thus, a documentary review of the three Australian supermarkets’ websites and sustainability reports (where available) over the past 10 years (ended June 2013) was undertaken. In addition, interviews indicated the influence of the UK on the WA agrifood sector, so the websites and sustainability reports of Sainsbury and Tesco, the two largest UK supermarket chains, were also analysed over the ten year period. Further, an interviewee referred to Walmart (USA), the largest retailer in the world, as an inspiration for their green supply chain practices (Res15 2012). Thus, Walmart was included, providing a further international comparison. The supermarkets reviewed are large global companies, as indicated in Deloitte’s ‘Global Powers of Retailing’ report, which lists the 250 largest retailers in the world (Wal-Mart is the largest, Tesco PLC 3rd, Woolworths Ltd 17th, Wesfarmers Ltd (owner of Coles) 18th and J Sainsbury PLC 29th (based on 2011 figures)) (Deloitte 2013). The review
focused on trends over the 10 year period, as well as company cross-comparisons and country cross-comparisons of:

1) The main environmental issues.
2) Intra-organisation ES practices.
3) Inter-organisation ES practices and approach to ‘whole-of-supply-chain’.
4) ES events.

The ‘whole-of-supply-chain’ approach referred to in item 3 was of importance, as it represents a process of spread and has been emphasised as an important issue in the latest GRI series 4 sustainability reporting guidelines, as well as in the EU sustainability reporting review (European Commission 2011). When reviewing the sustainability report of a company that has diverse operations (e.g. supermarkets, office supplies and insurance), the review was restricted to the part of the report dealing with general sustainability policies and the section dealing with supermarket operations.

3.4.4.3 ‘Sow stall free’ practices and their inclusion as an embedded case

A topical issue in the Australian pork industry at the time of the interviews, which was highlighted by most pork industry interviewees, was the banning of sow stalls in Australia. ‘Sow stalls’ are narrow individual stalls in which sows are kept during pregnancy, which can be most of their adult lives. Sow stall issues were also highlighted in the Farming for the Future documentation that suggested it had been an issue in the WA pork industry for some time (DAFWA et al. 2008). This led to a question as to whether the spread of ‘sow stall free’ practices should be considered as an environmental or social sustainability practice.

At the time of the interviews there were mixed interpretations about the classification of animal welfare practices. For example, the GRI sustainability reporting G3 guidelines did not mention animal welfare and, in the GRI G3 food processing sector supplement, ‘animal welfare’ was addressed under social sustainability, while biodiversity was addressed under ES (GRI 2011). In the WA Farming for the Future Baselines document, animal welfare was addressed under ‘biodiversity’, which was a
separate category to the ‘natural resource and production sustainability’, ‘social sustainability’ and ‘economic sustainability’ categories (DAFWA et al. 2008), adding to the confusion. Subsequently, the 2014 GRI G4 food processing sector supplement placed ‘animal welfare’ under ‘social’ and ‘biodiversity’ under ‘environmental’ sustainability. Some organisations suggest animal welfare issues cut across these classifications (Eurogroup-for-animals 2010).

It was decided to include the spread of sow stall free practices in this study as:

1) Interviewees consistently included these practices in their discussion of ES practices.

2) It was a very topical issue in the WA pork industry.

3) There appears to be some room for interpretation as to the appropriate category of these practices, given the differences in the categorisation of ‘animal welfare’ and ‘biodiversity’ in the Farming for the Future Baselines document and the GRI food industry sector supplement.

4) The interviews suggested significant inter-dependence between sow stall free practices and general ES practices (for example, how pigs are housed (animal welfare issue) impacts on waste management procedures (ES issue)).

5) The spread of sow stall free practices offered an interesting embedded case comparison to the spread of general ES practices.

Thus, even if ‘sow stall free’ practices are social sustainability practices, their spread was included as their spread was interrelated with other ES practices and offered an interesting comparative process of spread.

3.4.5 Analysing the case study evidence

The case study evidence consisted of 34 interview transcripts and the analysis of secondary data, including a ten year review of the sustainability reports of five large supermarkets. Pettigrew (1997) argued a weakness of some case study research is a neglect to explain how the data was analysed. Hence, an explanation of the data analysis undertaken in the current study is provided.
Prior to conducting the interviews secondary data was used to generate an initial understanding of the relevant events relating to ES in the WA agrifood sector at a global, Australia, State (WA), agrifood sector and industry level. Initial interviews were then conducted with actors who were expected to have an overarching perspective of ES in the agrifood sector. When approximately 60 percent of the interviews were completed, the interview data was analysed to draw out key themes from the data, such as whether spread was occurring or had occurred, the main processes of spread, the main influencing factors concerning spread, similarities and differences in interviewees’ perspectives, perceived important events and whether there was evidence of SCM taking place. An open minded approach was employed and key themes were allowed to emerge from the data.

A flexible approach, as suggested by Halinen et al. (2013), was taken in identifying relevant ES events and influencing factors. Events potentially relating to the spread of ES practices were identified using the interview data, secondary data and when following up leads from the interviews. The 10 year sustainability report review also showed what was high on the sustainability reporting agenda each year for the large supermarkets, which offered a way of detecting relevant events at local, State, Australia, and global levels. It was found events, their antecedents and consequences were sometimes difficult to distinguish. Thus, a flexible approach was adopted and all such occurrences were termed ‘events’, as only on later analysis could one start to gain an understanding of the roles that an event played in the process(es) of spread.

Concurrently, theories of spread from the literature review were borne in mind and there was a constant reconciling between the empirical and theoretical world, as is required in abductive research. When analysing the interview transcripts, key themes were made into headings and quotes were accumulated under the relevant heading and sometimes under multiple headings.

At this interim stage of analysis, the detailed 10 year review of the supermarket sustainability reports was conducted to confirm and add to the timeline of events relating to ES, as well as to get a better understanding of the roles the supermarkets played in spread. This review helped triangulate the interview data.
Once the interviews were complete, all of the interview data was reanalysed into major themes, using some of the themes identified in the preliminary analysis as a starting point, but adopting an open mind as to what might emerge. The interviews relating to the individual cases were analysed at a more detailed level of analysis by summarising the relevant events in tables that can be seen in subsequent Chapters.

The empirical findings were constantly compared with the theory outlined in Chapter 2 and processes of spread were identified in the data. The processes of spread for each case were summarised in a table, which denotes the associated events, interview quotes and other relevant evidence. Cross-case comparisons were conducted between the processes of spread of ES practices in the WA pork and dairy industries (case study A1 and case study B) and between the spread of ES practices and sow stall free practices in the WA pork industry (case study A1 and case study A2).

3.5 Some limitations of the methodology and ways to overcome these

One of the main detractions of case study research is a lack of ability to generalise results (Yin 2009). However, this was mitigated in the current study by aiming to achieve analytic generalisation from empirical results to a theoretical understanding. There are limitations to interview data, such as the ‘guinea-pig’ effect, in which people react differently when they know they are being measured. These weaknesses are reduced by being aware of them and by using multiple sources of data, such as documents and the sustainability report review. The interviewees may also not remember facts retrospectively with accuracy. This was mitigated by scrutinising media reports and the sustainability reports when issues arose in interviews.

There was difficulty in differentiating influencing factors from events and consequences of events. This was mitigated by taking a flexible approach to events and including all events potentially affecting the spread of ES practices in the WA agrifood sector in the analysis and later excluding an event if irrelevant. An unexpected challenge related to the categorisation of animal welfare practices, as was discussed in section 3.4.4.3.

Process research in an industrial network setting can be complicated due to interconnectedness, multiple processes and multiple levels involved. This was
partially overcome by tracking events over time and at different levels to try to identify core patterns.

3.5.1 Research quality

In accordance with Yin (2009), quality control was addressed. Construct validity refers to the establishment of operational measures for the concepts being studied. This was addressed by, for example, describing what is meant by ‘relevant events’ and ‘process of spread’. Internal validity was addressed, where logical and temporal connections between events were shown, and the case study evidence was analysed in a systematic and coherent way. External validity was addressed by delineating the extent to which the study’s findings might be generalised. Reliability was addressed by describing the data collection and analysis procedures in detail and supporting conclusions with case study evidence so if the case study were to be repeated the same findings and conclusions could be reached.

Further suggestions to improve quality control were also accepted (Yin 2009), such as using multiple sources of evidence (e.g. multiple interviewees, interview and documentary data), establishing a chain of evidence (e.g. the processes of spread identified were backed up by sources of evidence, which led to the identification of the processes in various tables), asking key informants to review a case study report (interviewees were asked to review their transcripts and case study findings were discussed with Res5, an industry specialist) and addressing rival explanations (e.g. explanations were sought from interviewees in various network positions and four areas of literature were considered, namely industrial networks, the diffusion of innovations, complexity science and SCM).

Dubois and Gadde (2002) suggested logical coherence is an important foundation for quality in case research. To this end, for each case, the network case history is presented in detail, the relevant events summarised in a table and the processes identified are summarised in a further table, including supporting evidence such as relevant events and interview quotes. Triangulation, which refers to using more than one source of data concerning a single point (Marshall & Rossman 2011), was applied throughout the research process to improve data verification. Data triangulation (the comparison across data sources, such as interview, documentary
and sustainability report review data), theoretical triangulation (the evaluation of different theoretical explanations for the same data set such as the consideration of the various theories of spread in Chapter 2) and methodological triangulation (the use of different research strategies – such as interviews and the sustainability report review), were used here (Welch 2000). The third party assurance of the Wesfarmers, Woolworths and Walmart sustainability reports added to the validity of the data. The interview data, newspaper articles, sustainability reports and industry documents were also triangulated to improve data validity.

A number of actions were taken to increase the design validity of the case studies, in accordance with criteria discussed by Newman and Benz (1998). The data was considered to be neutral, as multiple perspectives were obtained from actors in various positions in the network. Sufficient time was spent conducting fieldwork to obtain a good picture of the consistency of behaviour, as a saturation point was seen as reached when new data yielded similar results. Interviews with agrifood sector academic experts and government officials with holistic perspectives of the sector provided ‘peer debriefing’ (i.e. where the researcher conferred with other professionals to get their perspectives on what they had seen or experienced). To this end, the researcher spoke to one industry expert (Res5) towards the end of the data collection phase and, after inquiring about the interviewee’s views, presented some preliminary findings and asked if the interviewee concurred with these interpretations (the interviewee concurred on most points).

‘Member checking’ was used where the researcher triple checked the accuracy of the transcriptions and asked interviewees to review them and report any errors. Referential materials (i.e. supportive material, such as media reports of events reported in the interviews) were used. Structural relationships were used in that there was a logical consistency between different data sets (e.g. interview data and media reports), as well as between the various interviews. Theoretical sampling was used, as the researcher followed the data where it led. Design validity was increased by ‘leaving an audit trail’ (i.e. good documentation of transcripts and other documents and details about the analysis of the data) that would enable another researcher to replicate the research.
3.6 Chapter summary

This Chapter discussed the research philosophy used in the current study. The details of the research design, data collection and analysis methods were also delineated and there was a discussion of the reasons why a case study methodology was chosen. Challenges faced during the study were outlined and the approaches used to address them were explained. The next Chapter presents the results of the review of the sustainability reports of the large Australian retailers (Coles and Woolworths) and their UK and USA comparatives. These results provide a background to the case study results that are presented in Chapter 5.

3.7 Structure of the results, analysis and discussion Chapters

The following three Chapters present the results, analysis and discussion of results in terms of the literature review. When deciding how to present the data, analysis and discussion, the size and complexity of the three case studies, as well as the supermarket review, led to the need to think carefully about structure. The supermarket review results are presented first in Chapter 4. This enabled the role played by these dominant actors in the case study networks, as well as trends in comparative international supermarkets that influence the WA agrifood sector, to be understood.

The three network case studies are then presented in Chapter 5. Each network case included a detailed systematic case history over time. The events identified as relevant to the processes of spread are summarised in event tables for each case, with events being categorised as occurring at an international, Australian, Western Australian and industry level. The case studies included events and data discussed in the supermarket review presented in Chapter 4.

The narrative case histories and events tables led to an understanding of the processes of spread and these were summarised in process tables. The tables show which events and interview quotations were related to each identified process. The complexity of the network case studies and the need to systematically lay out the chain of evidence from events to processes led to the decision to present the results and analysis in Chapter 5, while a more in-depth discussion of the results in terms of
the literature is provided in Chapter 6. In Chapter 6, the cases are compared and the data are discussed in terms of the initial conceptual framework and the literature review. Chapter 6 culminates in an empirically informed framework that can be used to understand the spread of ES practices in business networks.
CHAPTER 4 - THE SUPERMARKET SUSTAINABILITY REPORT REVIEW

4.1 Introduction

This Chapter presents the results of the ten year review (2004-2013) of the sustainability reports of the large Australian supermarkets (Coles and Woolworths), as well as international comparative companies. The sustainability reporting of IGA, a further important retail chain in WA, was also reviewed. The review provides background context relevant to the three case studies presented in Chapter 5. Interviewees and documents consistently indicated the dominance of Coles and Woolworths over the Australian and WA agrifood sector, as well as the WA pork and dairy industries. Coles, Woolworths and IGA were important actors in the three case studies and this Chapter provides an interpretation of their perspectives of sustainability issues.

4.1.1 Brief background of the large Australian supermarkets

In March 2013, Coles accounted for 32% of the Australian ‘supermarket and grocery store’ industry and Woolworths 39% (IBISWorld 2013). The IGA supermarket chain also features strongly in WA, followed by much smaller retailers. The growing importance of private-label/house-brand merchandise has led to supermarket price wars on everyday goods and intense competition between Coles and Woolworths (IBISWorld 2013). ‘House-brands’ are goods manufactured by one company that are sold under the brand of another company. At a national level, house-brands account for around 25% of the Australian grocery market, compared to over 53% in Europe and 35% in North America (IBISWorld 2013). The price wars have made survival difficult for smaller independent retailers and price cuts on everyday items, such as milk, bread, meat, fruit and vegetables, have led to fears farmers will be pushed off their land. However, it is suggested retailers, processors and distributors have absorbed these price cuts, not farmers (IBISWorld 2013). Everyday items are being used as loss leaders by the retail giants to get people to their shops in the hope customers will purchase other items at the same time (IBISWorld 2013). The relationship between the major retailers and suppliers is also under scrutiny, as can
be seen in reports by the media and the Australian Competition Commission (Trute 2013).

4.1.2 Key details of the sustainability reports of the companies

Table 6 shows some key details from the sustainability reports (SRs) of the six companies reviewed. As seen in Table 6, Tesco and Walmart have operations in many countries, while the other four supermarkets are limited to operations in one or two countries. Table 6 shows that all supermarkets, except for IGA, started producing sustainability reports (SRs) in the 2000s. The Woolworths and Coles SRs have been independently assured since 2008 using the Global Reporting Initiative (GRI) 3 series reporting guideline and Walmart since 2012. Woolworths attained an A+ rating since 2009. The Sainsbury SRs were the first to emphasise animal welfare, followed by Tesco, with the Australian retailers following five years later; the Walmart reports did not focus on animal welfare during the period under review. The Woolworths SRs emphasise animal welfare issues two to three years before the Coles SRs. However, the Coles SRs have shown a significant focus on some animal welfare practices (e.g. sow stall free pork) since 2010.

<table>
<thead>
<tr>
<th>Countries present</th>
<th>Woolworths</th>
<th>Coles</th>
<th>IGA</th>
<th>Tesco</th>
<th>Sainsbury</th>
<th>Walmart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia, New Zealand</td>
<td>Australia</td>
<td>Australia</td>
<td>UK and global</td>
<td>UK</td>
<td>USA and global</td>
<td></td>
</tr>
</tbody>
</table>

|-------------------------------|------|-------------------------------|--------|------|------|--------------------------------|

<table>
<thead>
<tr>
<th>Independently assured</th>
<th>Since 2008</th>
<th>Since 2008</th>
<th>n/a</th>
<th>n/a</th>
<th>n/a</th>
<th>Since 2012</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>GRI 3 series rating</th>
<th>2009-2013: A+ 2008: B+</th>
<th>2010-2013: B+</th>
<th>n/a</th>
<th>n/a</th>
<th>n/a</th>
<th>2012-2013: B</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Animal welfare issues a focus</th>
<th>Mentioned in 2007, in focus in 2010</th>
<th>2010</th>
<th>n/a</th>
<th>2005</th>
<th>Since before 2004</th>
<th>Not a key focus</th>
</tr>
</thead>
</table>

The supermarkets have used various names for their ‘sustainability’ reports, sometimes changing the name of the reports over time (e.g. Woolworths). In the
current study, the term ‘sustainability report’ (denoted as ‘SR’), refers to all reports that, together with the annual financial statements, cover the sustainability triad of the social, environmental and economic aspects of the business. The following sections present the findings from the SRs of the six companies, after which inter-company and inter-country comparisons are reported.

4.2 Woolworths Limited (Australia)

4.2.1 Introduction

Woolworths is Australia’s largest supermarket chain and has stores in Australia and New Zealand. The supermarket chain is owned by Woolworths Ltd (Woolworths), which has been listed on the Australian Stock Exchange since 1993. Woolworths has multiple business units, including clothing, home improvement and financial services areas. Table 7 shows the sustainability documents included in the review.

Table 7: Documents included in the 10 year SR review for Woolworths

<table>
<thead>
<tr>
<th>Year ended:</th>
<th>Report:</th>
<th>Comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 2004</td>
<td>‘Woolworths Ltd annual report June 2004.’</td>
<td>Integrated report, more pages dedicated to environment and community than in previous years. Comments made about ‘triple bottom line’.</td>
</tr>
<tr>
<td>Year ended:</td>
<td>Report:</td>
<td>Comments:</td>
</tr>
<tr>
<td>-----------</td>
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</table>

Over the review period (2004-2013), the SRs have been very comprehensive, holistic, transparent and explanatory, helping stakeholders better understand Woolworths’ approach and decision-making processes regarding sustainability issues, including difficulties experienced. An example of the transparent and explanatory approach is seen in the acknowledgement in their first SR in 2005 that:

“Some of the environmental objectives we have set are straightforward - reducing energy consumption and increasing waste recycling, for example. However, some are more complex where finding a balance between competing objectives is more difficult to achieve. For example, how far do we reduce food packaging without compromising food safety? How do we continue to reduce general waste disposal against a backdrop of increased sales activity in our stores?” (Woolworths Ltd 2005, p. 2).
Another example of their transparent reporting approach is recognition that:

“the measurement of our environmental impact is a complex process. One of the major considerations is the definition of scope. For example, when assessing the carbon emissions associated with food transport, where do we draw the line? Do we count emissions generated by the journey from farm to market, from market to distribution centre, from distribution centre to store and from store to home? Do we set the boundary even wider?” (Woolworths Ltd 2007a, p. 10).

The SRs suggest Woolworths is aiming for, and achieving, leadership status in sustainability and sustainability reporting, nationally and internationally. The independent assurance report by NetBalance (the independent assurance company that audits both Australian retailers) noted “Woolworths continues to demonstrate leadership in the retail sector globally in regards its corporate responsibility disclosure and performance” (Woolworths Ltd 2011, p. 53). The 2008 to 2013 independent assurance reports are complimentary stating the improvements made each year. The achievement of a leadership position is also demonstrated by Woolworths’ achievement of an A+ GRI level from 2009 to 2013. The leadership and performance is further demonstrated by sustainability awards such as the ‘sustainable retailing’ category in the ‘2012 BRW Australian Retailer of the Year Awards’ and being the ‘2013 Global leader in the Dow Jones sustainability indices for food and staples retailing industry.’

Woolworths’ strategic goal to be a sustainability leader is shown in their 2007 strategy document: “By virtue of our size, scale, and the complexity of our business, Woolworths is a significant player in the Australian and New Zealand economies. With that profile comes not only a responsibility to understand and manage our impacts, but also a tremendous opportunity to achieve lasting and beneficial change that extends beyond our own operations. We aim to move to a leadership position on sustainability” (Woolworths Ltd 2007a, p. 3). This goal was reiterated by Woolworths in the 2009 SR: “Woolworths Limited’s long-term goal is to be recognised as the leader in sustainable retailing in the Australian retailing sector. As such, integrating corporate responsibility and sustainability into our day-to-day business practices is a high priority” (Woolworths Ltd 2009, p. 1).
Woolworths interacts at an international level over sustainability issues and policies. Woolworths’ role as a global actor in sustainability and retail and their role in championing national interests and spreading ES practices to other organisations is indicated by the organisation’s recognition that through “close association with global organisations such as The Consumer Goods Forum and The United Nations Global Compact Network, we are at the forefront of debate and central to the positive change taking place in critical areas such as ethical sourcing. Working collaboratively with the world’s best retail organisations, Woolworths is actively ensuring that Australia’s and New Zealand’s interests are represented and paving the way for other retailers to follow and adopt more sustainable working practices” (Woolworths Ltd 2012, p. 6). Thus, Woolworths is interacting at an international level, as well as at national, state and local levels, and strives to be an exemplar company in terms of sustainability, thereby assisting the spread of ES practices.

The reports indicate Woolworths are open to ideas and seek to learn from other organisations, and, at the same time, are willing to share their learnings. For example, they look to world best practice regarding sustainability and have a Corporate Responsibility panel that communicates national and international best practice to the CEO and senior management (Woolworths Ltd 2009). They also engage specialists to help them improve sustainability. The SRs also suggest Woolworths provides training for employees, suppliers and customers regarding sustainability issues.

The SRs highlight Woolworths’ notion that sustainable behaviour should make business sense (i.e. contribute to environmental and economic sustainability):

“As one of Australia’s largest companies, the changes we make can have an enormous impact - on our shareholders, our suppliers, our staff, our customers, and our local communities. But more than anything, sustainable behaviour just makes good business sense” [italics added] (Woolworths Ltd 2007a, p. 2).

“Driving change through the demonstration of clear and quantifiable business payback is central to all Woolworths investments, and sustainability is no different…Business decisions are now more frequently
assessed on the basis of both fiscal and sustainability outcomes” (Woolworths Ltd 2010, p.3).

4.2.2 Trends in the main ES issues

The Woolworths SRs address many and diverse areas, such as the environment, ethical sourcing, support for Australian suppliers, Fairtrade, consumer health, safety and indigenous rights. Some sustainability areas have been a consistent focus in the decade under review, such as ES. The key areas covered in ES include climate change, energy use, water use, packaging, waste, food waste and green buildings. The SRs indicate the key role played by the voluntary Australian Packaging Covenant in informing Woolworths’ approach to packaging.

Other areas of sustainability receiving consistent focus over the period are ethical sourcing and support for Australian suppliers. The Woolworths Ethical sourcing policy was introduced in 2009 in response to concerns over products sourced from emerging economies. In 2012 Woolworths noted “67.6% of factories making our own brand products were audited on Ethical Sourcing criteria” [italics added] (Woolworths Ltd 2012). So the ethical sourcing policy audit applies predominantly to house-brand suppliers and not to all suppliers.

Woolworths have a long house-brand history of more than 25 years (Woolworths Ltd 2008). Woolworths provides figures of the percentage of products that are branded versus house-brand goods. For example, in packaged groceries and perishables, they stock more than 44,000 lines, of which 94% are branded products and 2,500 (6%) are Woolworths house-brand products (Woolworths Ltd 2012). Knowing the percentage of house-brand versus other brands is significant when understanding claims made about house-brand products, which increases transparency.

Some sustainability issues have grown in importance over the years under review, such as animal welfare. Animal welfare issues relating to free range pork and eggs were briefly mentioned in the 2007 SR (Woolworths Ltd 2007b). At that time, while Woolworths wanted to increase their free range products, they acknowledged that environmental and climatic requirements in Australia may constrain the supply of free range production (Woolworths Ltd 2007b). The focus on caged eggs and sow stall free pork had grown significantly by 2010 and remained a highlighted feature in
the 2013 report. Woolworths focuses on a number of issues in their SRs, such as domestic sourcing, ethical sourcing and animal welfare (e.g. sow stall free pork, cage-free eggs and sustainable seafood) in their house-brands. They place emphasis on a number of issues and do not highlight one in particular.

4.2.3 Intra-organisation ES practices

Woolworths uses a number of intra-organisation ES practices and the focus on sustainability is integrated at all levels within the business, from the Board to the shop floor. Woolworths use various processes to spread ES practices within its business, such as the use of a Board committee, eco-ambassadors and staff sustainability training. While acknowledging their influence and role in green SCM, Woolworth’s approach is to focus in-house and then on the supply chain: “Our environmental impact and footprint extends well beyond resources directly used to operate our stores and transport goods. However, it is our responsibility to first address our immediate and direct environmental impacts before influencing those of our suppliers. This philosophy has underpinned our boundary determination in focusing on issues we directly control or have significant influence on so we can implement improvements faster and more effectively” [italics added] (Woolworths Ltd 2008, p. 60).

4.2.4 Inter-organisation ES practices and approach to ‘whole-of-supply-chain’

Woolworths’ key strengths, as indicated in the SRs as well as in the independent assurance reports, are interactions, communication and feedback about sustainability issues obtained by Woolworths from its internal and external stakeholders (such as staff, suppliers, not-for-profit organisations, government, green specialist companies, industry representative organisations, customers and other retailers). Woolworths play a role in joint ES initiatives, such as establishing a ‘Plastic Bags Task Force’ with the Australian Government, State Governments and industry bodies (Woolworths Ltd 2006). Woolworths has partnered with the national Landcare programme since 2007. Woolworths interacts with many organisations at local, national and international levels.

At a local and national level Woolworths sees itself as a long-standing supporter of Australian growers, farmers and producers and as the largest single customer of
Australian agricultural and horticultural products (Woolworths Ltd 2007b). In 2013, Woolworths sourced 96% of its fresh fruit and vegetables and 100% of its fresh meat from Australian farmers and growers (Woolworths Ltd 2013b). Woolworths claim most of their house-brand groceries (71%) by sales volume are made in Australia (Woolworths Ltd 2012), noting: “Our customers have told us they want Woolies to support their local communities and source more local foods” (Woolworths Ltd 2013a, p. 14). To this end, Woolworths have engaged in an import replacement program, working with Australian suppliers to help develop their technology and farming practices (Woolworths Ltd 2007b). One such initiative is the ‘$1 million Woolworths Fresh Food Grant Fund’ announced in 2007, through which a grant of A$100,000 is awarded annually to encourage Australian fresh food suppliers in the development of commercially and environmentally sustainable fresh food innovations (Woolworths Ltd 2007b).

Woolworths have an ‘Ethical Sourcing Policy,’ the objectives of which include working with suppliers to improve their social and environmental practices and providing clear guidance to buying staff. All Woolworths suppliers are expected to comply with requirements of the policy, which is complemented by a compliance audit programme for suppliers of house-brand products (Woolworths Ltd 2009). They aim to audit all suppliers of house-brands over a two-year timeframe, based on a risk assessment type approach to prioritise who to audit first (Woolworths Ltd 2009). Interestingly, many claims are made about house-brands, but not as many claims are made about branded products.

All suppliers of fresh food products and some general merchandise products in Australia must be certified to the Woolworths Quality Assurance (WQA) standard (Woolworths Ltd 2009). The WQA programme is also audited globally to ensure the compliance of international suppliers of house-brand and fresh food suppliers. Woolworths Ethical Sourcing policy was updated and included in the WQA standard since 2009 (Woolworths Ltd 2009). Thus, environmental (and other) sustainability criteria are now included in the Woolworths Quality Assurance programme. The reports suggest Woolworths takes more responsibility for the supply chain of fresh food and house-brand products than other suppliers. There is limited discussion of
the green purchasing criteria or the auditing of *internationally-sourced, branded, non-fresh* products.

There has been much press and investigations into the power of Coles and Woolworths and their treatment of suppliers (The Sydney Morning Herald 2014; Trute 2013). In a number of the issues, such as ‘A$1 per litre milk’ and ‘sow stall free’ practices, Woolworths seems to have followed Coles and not been the initiator. In June 2014, there was renewed tension between Woolworths and the Australian Vegetable Growers Association (AusVeg) because of a levy charged by Woolworths to farmers for a recent Jamie Oliver marketing campaign (The Sydney Morning Herald 2014).

Thus, even though Woolworths note their support of Australian farmers and suppliers, there is tension between the supermarket and its suppliers, also seen by the need to develop a voluntary code of conduct that was negotiated between Coles and Woolworths and the Australian Food and Grocery Council (AFGC). The purpose of the code is to “‘even up the imbalance’ in market power in negotiations between the supermarkets and suppliers” (Trute 2013). In November 2013, Coles and Woolworths “agreed to a code of conduct governing how they deal with suppliers, providing a potential solution to long running tension between food and grocery producers and retail giants” (Trute 2013, p. 1).

Woolworths’ claim to engage in a ‘whole-of-supply-chain’ approach to animal welfare to meet community expectations. The reports suggest Woolworths “work closely with our trade partners, supply chain, certification bodies and industry experts to help ensure that our standards, procedures and practices are in keeping with the community’s expectations” (Woolworths Ltd 2011, p. 16).

Woolworths reported on animal welfare issues earlier than Coles, but use less onerous purchasing criteria. The Woolworths reports show understanding of stakeholders’ issues. For example, the reports acknowledge the increased costs incurred by suppliers to go ‘sow stall free’: “We are mindful of the magnitude of change and investment such developments may represent for our suppliers. We have a responsibility to suppliers and customers to introduce any fundamental change such as this in a responsible manner so suppliers have the capacity to invest in change and
can provide our customers with affordable product” (Woolworths Ltd 2010). Nevertheless, Woolworths has imitated Coles in these contentious issues, suggesting financial sustainability overrides supplier relationships.

4.3 Coles supermarkets (division of Wesfarmers Limited) (Australia)

4.3.1 Introduction

The Coles supermarket chain (Coles) is owned by Wesfarmers Limited (Wesfarmers) which is one of Australia’s largest listed companies (Wesfarmers Ltd 2013a). Wesfarmers operates diverse business operations, including supermarkets, department stores, home improvement and coal mining. The Coles group was acquired by Wesfarmers Limited in 2007. Coles consists of supermarkets, liquor stores, Coles Express sites and hotels (Wesfarmers Ltd 2013a). The focus of the review is on Coles’ supermarket operations. Table 8 shows the documents included in the review.

Coles has a history of sustainability reporting, with its first sustainability report being issued in June 2004. When Wesfarmers bought Coles in 2007, Wesfarmers already had a long history of sustainability reporting (since June 1998). Apart from being assured by its Board, the Wesfarmers SRs have been independently assured since June 2007. In addition, the SRs have been assured according to the GRI 3 series guidelines since June 2010, being rated at the B+ application level since 2010.

The Coles website gives more sustainability information than the Wesfarmers SRs, which gives information for Wesfarmers as a whole and then dedicates a section of the report to the Coles division. The reports clearly show Coles Myer (former owner of Coles) and Wesfarmers are large companies with resources, including funding and expertise, which they have applied to sustainability issues (including reporting), as indicated in the independent assurance report comment: “Wesfarmers would now be considered an organisation with substantial expertise in preparing public Sustainability Reports. The organisation produces a good quality Report that addresses its environmental, social and broader economic issues” (Wesfarmers Ltd 2008, p. 131). The reports show an emphasis on sustainability from top management and the Board.
<table>
<thead>
<tr>
<th>Year ended:</th>
<th>Report:</th>
<th>Comments:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 June 2005</td>
<td>‘Coles Myer Ltd 2005 annual report.’</td>
<td>Annual report and separate SR. Ethical sourcing code introduced.</td>
</tr>
<tr>
<td>3 June 2006</td>
<td>‘Coles Myer Ltd 2006 annual report.’</td>
<td>Annual report, could not access SR.</td>
</tr>
<tr>
<td>4 June 2007</td>
<td>‘Coles Group Ltd 2007 annual report.’</td>
<td>Sustainability information included in the annual report. ‘Wesfarmers Limited Sustainability Report 2007.’ Coles is not in report since it was only bought in 2008 financial year.</td>
</tr>
<tr>
<td>5 June 2008</td>
<td>‘Wesfarmers Limited Sustainability Report 2008.’</td>
<td>Coles is included in Wesfarmers’ SR for the first time. Coles included as a separate section in the report (each division of Wesfarmers is discussed individually in the report) together with general sustainability issues pertaining to the whole of Wesfarmers, which are discussed at a group level. SR independently assured.</td>
</tr>
<tr>
<td>7 June 2010</td>
<td>‘Wesfarmers Limited Sustainability Report 2010.’</td>
<td>SR independently assured. GRI 3 series B+ application level rating. Revamped ethical sourcing code. Increased marketing on animal welfare such as sow stall free pork.</td>
</tr>
<tr>
<td>Year ended</td>
<td>Report:</td>
<td>Comments:</td>
</tr>
<tr>
<td>-----------</td>
<td>---------</td>
<td>-----------</td>
</tr>
</tbody>
</table>

4.3.2 Trends in the main ES issues

The 10 years’ SRs relating to Coles are comprehensive and holistic, in that they cover many aspects of the business and stakeholders. Over the ten years, the basic environmental sustainability issues addressed have remained stable. In the 2005 Coles Myer report, the ES focus was on climate change and on reducing greenhouse gas emissions, energy use, water use, waste and packaging, which remain significant issues up to the 2013 report. Over the 10 years reviewed, animal welfare issues have become an increased focus, particularly since 2010, when Coles announced that they would only sell sow stall free fresh house-brand pork. To achieve this, Coles used their full supply chain and industry power to ensure Australian pork suppliers changed their practices. This shows that, when they choose, Coles has the power to bring about industry changes.

Many of the Coles marketed credence criteria (sow stall free, cage-free eggs, hormone-free beef) relate only to their house-brands and not their entire product range. For example, the sow stall free criteria initially applied to fresh pork in Australia (since fresh pork may not be imported into Australia) and later to house-brand processed pork. Since much processed pork is imported, this has allowed processed pork to be imported from countries that are not sow stall free. Coles do not give detail about the percentage of house-brands versus branded products which would enable a better understanding of their marketing claims.

The year 2010 seems to be a turning point in Coles marketing strategy, with an increased focus on issues such as sow stall free house-brand pork. Organic products have been promoted over the 10 years. In 2011, health and animal welfare issues were even more prominent than in 2010. Coles also started to promote “no added hormone beef” for fresh beef, the extension of sow stall free fresh pork to include
hams and bacon made from local and imported pork, all house-brand eggs being cage-free by 2013, an RSPCA-approved range of chicken products and sustainable seafood in partnership with WWF Australia for house-brand fresh, frozen and canned fish. The reports place an emphasis on relevant Australian, state and local laws, regulations and reporting requirements with which Coles needs to comply. Over the 10 year period, the reporting burden in terms of such laws, regulations and reporting requirements have increased.

4.3.3 Intra-organisation ES practices

Over the 10 years, Coles have achieved a high level of intra-organisation ES practices, such as building greener stores, using more efficient transport, refrigeration, lighting, and improved management of food waste, cardboard and plastic. Most of these practices seem to be ‘win-win’ in both economic and ES aspects. The voluntary ‘Australian Packaging Covenant’ appears to have played a key role in their waste minimisation efforts, which has directed innovations and actions, such as recycling at stores.

4.3.4 Inter-organisation ES practices and approach to ‘whole-of-supply-chain’

While the reports suggest Coles uses many intra-organisation ES practices, the reports suggest a comparatively low level of green SCM responsibility with some suppliers. Coles has focused on supply chain efficiencies, such as a five-year turnaround programme in 2001-2005 to improve supply chain business processes, and then again in 2008 when Wesfarmers acquired Coles. However, these programmes focused on productivity efficiencies and cost reductions, not ES issues.

Coles has an ‘Ethical Sourcing Code,’ which was developed in November 2005 and revamped in 2010. This code is used to manage non-Australian suppliers of house-brand products. Coles makes use of an audit process to improve ES practices in these non-Australian, house-brand suppliers: “In line with our approach of ensuring suppliers of Coles brand products comply with our ethical sourcing policy, over the past year we audited 85 suppliers out of 316 operating in non- Organisation for Economic Co-operation and Development member countries” (Wesfarmers Ltd 2011, p. 32). The focus of the code is more on social aspects (such as the use of child labour and working conditions) than the environment, although environmental
aspects are included. Over the ten years, the SRs show an increasing prevalence of house-brand products. The Coles ‘Australia first’ sourcing policy, especially for fresh food and house-brand products, shows they are responding to Australian customers’ preference for Australian fresh fruit and vegetables.

The reports suggest Coles has not used its full power to increase ES in all suppliers. It focuses on green SCM and green supplier development effort (through ethical purchasing criteria) on non-Australian suppliers of house-brands. Thus, they do not place an emphasis on spreading further ES practices to Australian suppliers nor to branded goods made in Australia or internationally. The SRs are silent on ‘whole-of-supply-chain’ responsibility (which is the focus of the latest GRI 4 series).

While Coles does not use its full power with respect to green purchasing, they have implemented some inter-organisation ES practices, such as reusable crates for farmers’ fresh produce, which reduces the packaging required. Environmental criteria are included in their purchasing criteria and they promote green products to niche markets (such as eco-friendly packaging of OrgN’s (see Chapter 5) products).

The observation that Coles does not take a ‘whole-of-supply-chain’ focus is echoed in the NetBalance assurance report in 2008 and 2009, which recommended in 2008 (and again in 2009):

“To be seen as an industry leader, the next step for Wesfarmers is to look beyond its own sustainability performance and look to use its large market capitalisation and exposure to diverse industries to influence the operations and behaviours of its stakeholders (largely retail and wholesale customers and to a degree its suppliers) to make positive sustainable impacts. Wesfarmers can achieve this through various means. Two immediately available options for the organisation are to increase the focus on supply chain management and to develop innovative products to tackle climate change through its products and services. The organisation is encouraged to develop a Sustainable Procurement Policy (either at the Group level or tailored policies at the Division level). This will serve as guidance for all procurement decisions and will encourage suppliers to offer more sustainable goods and services […]... As part of the
organisation’s extensive training suit, specific sustainability related training programmes need to be developed to help raise awareness amongst staff as to the importance and benefits of conducting business in sustainable manner” [italics added] (Wesfarmers Ltd 2008, p.131).

Thus, the independent assurers recognised that Wesfarmers was not using its influence over stakeholders to further the spread of sustainability practices. This quote illustrates processes can be spread through green specialist company assurance reports. The recommendations may assist in spreading international best practices to Coles and is, thus, one of the processes of spread. While Coles has not fully used its supply chain power to spread ES practices, they have played a significant role in the spread of ‘sow stall free pork’ practices, which suggests Coles has the power to exert supply chain influence if it should choose to do so.

The reports suggest Coles interacts with many actors, such as employees, customers, competitors (in managing one-use plastic), suppliers, government, animal welfare organisations, environmental organisations (e.g. teaming up with First Bite to use food past sell by date) and industry representative organisations. Coles has also partnered with the Landcare programme since 2001. Sometimes these actors have conflicting interests. In 2013 Coles decided to sell shopping bags promoting Animals Australia, which led to an outcry from farmer representative organisations who felt Animals Australia was anti-farmer (Res12 2013). Coles withdrew the bags within 48 hours, showing a need to manage stakeholders’ conflicting interests.

4.4 IGA (Australia)

4.4.1 Introduction

The IGA (Independent Grocers of Australia) is a large chain of retailers in WA that is an alliance between wholesalers, retailers and manufacturers. IGA first came to Australia in 1988 and are supplied by Metcash Food and Grocery (Metcash), which is a marketing and distribution company, operating in the grocery, liquor and hardware wholesale industries (Metcash 2013). Metcash is a publicly listed company and a signatory to the Australian Packaging Covenant. IGA and Metcash do not issue SRs, but the IGA and Metcash websites, as well as the Metcash annual report, provide sustainability information. A scrutiny of this information shows an
interest in sustainability and sustainability initiatives. However, IGA is not in the same league of sustainability reporting as other large retailers and is not discussed further.

4.5 Sainsbury (UK)

4.5.1 Introduction

Sainsbury published their first SR in March 2004. However, it had reported on its environmental performance since 1996 (J Sainsbury plc 2004) and was the first UK food retailer to publish an environment report (J Sainsbury plc 2009). Since 2004, the SRs have been very detailed and holistic. Sainsbury has won a number of sustainability awards, such as the Global Industry Leader in the Dow Jones Sustainability Index 2009/10. The Sainsbury reports lead in sustainability issues. For example, an organic range was introduced in 1986, an Environmental policy was issued in 1990, an ‘Ethical sourcing: Code of Conduct for Socially Responsible Sourcing’ was launched in 1998 and, in 1999, Sainsbury was the first major supermarket to eliminate genetically modified (GMO) ingredients from all house-brand food.

Sainsbury adopted a ‘whole-of-supply-chain’ and supplier development approach in 2004 and regards itself as an industry leader on sustainability issues (J Sainsbury plc 2004). Sainsbury acknowledge competing interests: “The right thing to do is rarely clear cut, as good intentions in one area can create unintended consequences in another” (J Sainsbury plc 2010, p. 1). Sainsbury try to ensure all globally sourced products are measured against an equivalent UK standard, showing a reliance on the UK legislation. This is unusual, as some retailers comply with standards in the country of manufacture, which may be lower.

Surprisingly, Sainsbury have never been assured by a third party, nor have they been assessed according to the GRI series. However, they state they have referred to the international environmental management systems (ISO 14000 (International Organisation for Standardisation) and EMAS (Eco-Management and Audit Scheme)) since 2004 and GRI ‘G3’ and Accounting for Sustainability’s ‘Connected Reporting Framework’ guidelines since 2009 (J Sainsbury plc 2009). The reports that were reviewed are shown in Table 9.
### Table 9: Documents included in the 10 year SR review for Sainsbury

<table>
<thead>
<tr>
<th>Year ended:</th>
<th>Report:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 March 2004</td>
<td>‘J Sainsbury plc. Corporate Social Responsibility report 2004.’ Sainsbury’s <strong>first</strong> SR. However they have reported on the environment since 1996.</td>
</tr>
<tr>
<td>2011</td>
<td>‘Sainsbury’s 20 by 20.’</td>
</tr>
<tr>
<td>9 March 2012</td>
<td>‘20x20 sustainability plan, 2012 update.’</td>
</tr>
</tbody>
</table>

#### 4.5.2 Trends in the main ES issues

As early as 2004, the Sainsbury SR was very comprehensive and covered many sustainability areas, such as Fairtrade, free range and gender equality. In 2004, Sainsbury was already established in sustainable fisheries, supporting national (British) products, animal welfare and GMO. The reports suggest Sainsbury differentiates itself through high animal welfare standards. Animal welfare issues were a focus in all of the reports. Sainsbury have been global leaders in animal welfare, as indicated by it becoming the first major supermarket to stop selling eggs from caged hens (in 2009) and they are trying to be number one in animal welfare:

> “Animal welfare continues to be one of our customers’ top concerns. Although our customers are looking for value in the current economic climate, they also want food which is reared to meet high animal welfare standards” (J Sainsbury plc 2009, p. 12).

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4.5.3 Intra-organisation ES practices

Sainsbury has implemented substantial intra-organisation ES practices since the start of the review period (2004). The retailer has used international management systems and identified eight categories in which its activities had a significant impact on the environment. Intra-organisation practices include reducing carbon emissions, energy and waste. Sainsbury focuses on reducing the environmental impact of products, which shows some product stewardship.

4.5.4 Inter-organisation ES practices and approach to ‘whole-of-supply-chain’

As early as 2004, the Sainsbury reports showed recognition of the need for green SCM:

“We recognise that our business has many environmental and social impacts. Some of these are associated with the activities of our suppliers and are outside of our direct control. We want to promote more sustainable practices within our own operations and where possible use our influence as a major customer to improve environmental standards in our supply chain” (J Sainsbury plc 2004, p. 31).

Included in their 2004 goals was a clear focus on their house-brand products and suppliers, as indicated by their goal to: “Influence our suppliers to reduce their direct environmental impacts and improve the environmental quality of own-brand products through more sustainable sourcing” (J Sainsbury plc 2004, p. 35).

As early as 2004, the SRs show stakeholder engagement, supplier training and development. The reports mention working with suppliers on issues such as ‘Buy British’, animal welfare (including cage-free eggs), fisheries, organic, pesticides, palm oil, health, and work life balance. In 2011, they launched a ‘supplier environmental scorecard’ to track and measure supplier environmental footprints and launched a Carbon Academy to train 20,000 suppliers, contractors and colleagues to reduce Sainsbury’s carbon footprint by 2020 (J Sainsbury plc 2011). Thus, the reports show a focus on a ‘whole-of-supply-chain’ approach to ES.
4.6 Tesco (UK)

4.6.1 Introduction

Tesco has stores in many parts of the world, which makes sustainability reporting more challenging due to the different ES legislation in various countries. Table 10 shows the SRs reviewed. Tesco has issued a separate SR since 2001. The quality of the reports was poor at the start of the review period (2004). For example, the early reports did not include data from operations outside of the UK, showing a lack of completeness in reporting. The 2005 report focused on the UK business (which made up 75% of sales) and did not consider green SCM.

**Table 10: Documents included in the 10 year SR review for Tesco**

<table>
<thead>
<tr>
<th>Year ended:</th>
<th>Report:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Feb 2004</td>
<td>Could not be found.</td>
</tr>
</tbody>
</table>
Tesco website, Nov 2013. |

However, there was considerable improvement in the reporting and ES practices employed by Tesco over the years. By 2010, supply chain and stakeholder issues were a focus and the reports covered Tesco’s global operations. In 2011, Tesco was named the top retailer in the Carbon Disclosure Project’s 2010 UK FTSE 350 and Global 500 reports for carbon reporting and performance (Tesco 2011). Tesco
reports are neither independently assured nor rated according to the GRI 3 series guidelines. In the 2006 report, Tesco claimed to take the principles of the GRI 2002 Sustainability Reporting Guidelines into account.

The issues addressed in the initial reports did not seem to be as advanced as later reports and, by 2013, the focus was on sustainability: “Corporate responsibility is neither new nor optional. It reflects the inescapable reality that, if the values of a business fail to resonate with the values of the society in which it operates, it is endangering its own long-term prosperity. Customers will simply go elsewhere” (Tesco 2013, p. 3).

4.6.2 Trends in the main ES issues

From 2005 (the 2004 report could not be found), the Tesco SRs covered a wide range of issues, including the promotion of local produce. ES areas of concern included energy, water, emissions, waste and recycling, products, seafood, green reusable trays and vehicle efficiency. Over the period, many issues were covered, but animal welfare was not a main focus (as it was with Sainsbury), although it was present. The 2013 report was presented in a different format and condenses the issues in focus to ‘new opportunities for young people’, ‘improving health’ and ‘reducing food waste’; marking a divergence from more traditional SR categories.

4.6.3 Intra-organisation ES practices

The reports suggest intra-organisation ES practices are at a high level and have improved over the period. Issues addressed included climate change, green buildings, transport, waste, packaging and recycling.

4.6.4 Inter-organisation ES practices and approach to ‘whole-of-supply-chain’

The early reports had a focus on high risk house-brand suppliers to ensure they upheld Tesco’s labour standards (Tesco 2005). In 2005, Tesco did not assume responsibility for green SCM, particularly in countries other than the UK (Tesco 2005). Over the review period, however, the reports indicated an increasing supply chain responsibility.
In 2009, Tesco tried to assist suppliers and customers to reduce their carbon footprint:

“Our climate change programme has three main parts: leading by example - reducing our own direct carbon footprint; working with our supply chains and partners to reduce emissions more broadly; and leading a revolution in green consumption” (Tesco 2009, p. 7).

This highlights a focus not only on Tesco’s organisation and supply chain, but on influencing end consumers. The 2009 report states: “We are working with major suppliers to find ways to cut emissions in the supply chain” (Tesco 2009, p. 11). Thus, even in 2009, Tesco articulated a green SCM approach. In 2010, Tesco pledged to cut emissions in the products in their supply chain by 30% by 2020 and to identify ways in which customers could halve their household carbon footprints by the same date; showing an attempt to apply a ‘whole-of-supply-chain’ focus and an end-consumer focus. Tesco clearly recognises the importance of focusing on the supply chain and consumers’ behaviour.

In 2010, Tesco claimed to be working with many actors as part of their supply chain strategy, including other retailers, government, suppliers, industry representative organisations, academics, non-governmental organisations (NGOs) and suppliers (Tesco 2010). Thus, by 2010, Tesco’s collaboration with multiple stakeholders suggested they had assumed supply chain management responsibility. In 2010, Tesco also took on a product stewardship approach: “This year we committed to achieving a 30% reduction by 2020 in the carbon impact of the products we sell. Clearly we cannot do this alone; we have invited all our suppliers to join us in this endeavour” (Tesco 2010, p. 14). By 2011, they had carbon footprinted over 1,000 and labelled over 500 everyday products (Tesco 2011).

By 2011, Tesco was embracing a ‘whole-of-supply-chain’ approach and recognising their role in spreading ES practices along supply chains and to other countries: “By engaging our thousands of suppliers across the globe, by sharing knowledge, and by collaborating with other global businesses and NGOs, Tesco and our industry can have a transformative effect” (Tesco 2011, p. 7), indicating Tesco’s acknowledgement of their global reach and potential to influence suppliers in other
countries. Recent reports reiterated a focus on working with suppliers and customers to achieve ES goals and again showed a green SCM focus. The title of the 2013 report highlights Tesco’s recognition of its influence: “What matters now: using our scale for good” (Tesco 2013, p. 1).

4.7 Walmart (USA)

4.7.1 Introduction

As already mentioned Walmart is the largest retailer in the world and has operations in most regions of the world. Table 11 provides a summary of documents included in the review.

<table>
<thead>
<tr>
<th>Year ended:</th>
<th>Report:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Jan 2004</td>
<td>Could not be found.</td>
</tr>
<tr>
<td>5 Jan 2008</td>
<td>‘Walmart Sustainability Progress to Date 2007–2008.’</td>
</tr>
<tr>
<td></td>
<td>Start of comprehensive sustainability reporting.</td>
</tr>
<tr>
<td>6 Jan 2009</td>
<td>‘2009 Global Sustainability report.’</td>
</tr>
<tr>
<td>7 Jan 2010</td>
<td>‘Walmart Global Sustainability Report 2010 Progress Update.’</td>
</tr>
<tr>
<td></td>
<td>Supplier development programme.</td>
</tr>
<tr>
<td></td>
<td>GRI 3 series: B rating.</td>
</tr>
<tr>
<td></td>
<td>GRI 3 series: B rating</td>
</tr>
</tbody>
</table>
As can be seen in Table 11, prior to 2007/08, Walmart issued ‘Ethical Sourcing’ reports, rather than SRs. In 2007/08 the reports suggested Walmart placed an emphasis on understanding their sustainability issues and they have issued comprehensive sustainability reports since then. Although no comprehensive SRs were issued prior to 2007/08, Walmart claimed their focus on ES started in 2005 (Walmart 2009). From 2007/08 the reports suggest Walmart has taken responsibility for spreading sustainability practices to all of their operations and suppliers. The reports suggest Walmart has adopted a SCM focus and a focus of working collaboratively with multiple actors.

Walmart have used some techniques such as ‘Sustainability 360’, which provides a comprehensive view of their business by engaging more than 100,000 suppliers, 2.2 million associates and hundreds of millions of customers around the world in their efforts (Walmart 2012). This shows a focus on supply chain as well as on consumers. Another innovative approach is the use of ‘Sustainable Value Networks’ to integrate sustainable practices into all parts of their business. Walmart claims these networks bring together actors from Walmart, suppliers, academia, government and NGOs to explore challenges and develop solutions to benefit Walmart, as well as local and global communities (Walmart 2012). Although GRI principles were mentioned in previous SRs, they were only rated against GRI 3 series criteria from 2012, receiving a ‘B’ rating.

4.7.2 Trends in the main ES issues

Prior to 2007/08, Walmart reports focused on labour, environment, health and safety at factories. From 2007/08 the reports covered a wider range of issues and report on operations in all regions. Animal welfare was not a particular focus over the review period.

4.7.3 Intra-organisation ES practices

From 2005, Walmart has undertaken practices to become a more environmentally-friendly retailer (Walmart 2009). From 2005, Walmart has focused on their products being ‘green’, showing product stewardship (Walmart 2009). From 2007/08 Walmart noted many internal ES practices in operations in all regions of the world.
4.7.4 Inter-organisation ES practices and approach to ‘whole-of-supply-chain’

Prior to 2007/08, Walmart used audits to ensure suppliers adhered to their supplier standards and local laws. The audits focused on high risk suppliers and house-brand suppliers. Over the review period, Walmart developed more supplier training and a more collaborative approach to bringing about changes in supplier operations.

The 2009 report suggested Walmart felt a focus on the supply chain was more effective than a focus on intra-organisation ES practices and outlined ways to help customers and suppliers with ES issues. Walmart noted its use of auditing had left a gap and that they needed to collaborate more with suppliers. Walmart subsequently launched an official supplier development programme, dealing mostly with working conditions but also covering environmental management issues (Walmart 2012).

Walmart has acknowledged that they are a large player on the world stage and that they should interact in public debates, such as the UN Summit on Climate Change in Copenhagen in 2009: “As the world’s largest retailer, we strive to positively impact global supply chain practices by consistently raising our own standards and partnering with other retailers, brands, suppliers, NGOs and government leaders to find innovative and sustainable ways to improve working conditions. Through this collaboration we work to help build ladders to a better life in the countries we source from” (Walmart 2012, p. 32).

4.8 A discussion of the supermarket reviews

What is apparent from the decade of reports are the numerous and varied, and sometimes conflicting, issues and pressures supermarkets need to consider. For example, pressure from shareholders to perform financially, pressure from consumers for good value, but also quality, health aspects of food, food labelling, food origin, traceability, food safety, child labour issues, environmental issues and convenience. Stakeholders also have conflicting priorities (e.g. farmers versus animal activists).

The SRs followed their own formats, which made it difficult to compare across companies. Many of the companies also changed the format of their reports (and
even their names) over time. The reports all showed improvement in comprehensiveness over time.

4.8.1 A comparison between Woolworths and Coles

Table 12 and Table 13 summarise the similarities and differences between the Woolworths and Coles SR data. Table 12 shows the supermarkets’ intra-organisation ES practices were similar, as was their focus on issues such as domestic sourcing, ethical sourcing and animal welfare. The specific environmental issues addressed were similar (e.g. climate change, carbon emissions, water, energy and waste).

The two retailers exercised green SCM through their quality assurance and ethical sourcing policies. Woolworths seemed more focused on the environmental side, whereas Coles emphasised social aspects. Even though the companies recognised their potential green supply chain influence, both focused on in-house ES issues, before considering supply chain ES issues. The focus of their green SCM was on house-brand goods manufactured in foreign countries with high ES risks. Neither company embraced a ‘whole-of-supply-chain’ responsibility. Both recognised the dominance of economic over environmental sustainability, by highlighting that ES practices need to make ‘business sense’. Both recognised and interacted with consumers, suppliers and other stakeholders about ES issues.

Table 12: Similarities between Coles and Woolworths SR data

<table>
<thead>
<tr>
<th>Factors</th>
<th>Similarities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intra-organisation practices</td>
<td>Both companies used substantial intra-organisation ES practices over the review period.</td>
</tr>
<tr>
<td>Inter-organisation practices</td>
<td>Neither company used their full SCM capability for ES practices, whereas they used this power to bring about industry changes regarding sow stall free pork.</td>
</tr>
<tr>
<td>Practice priorities</td>
<td>Both companies focused first on intra-organisation ES practices and then on green SCM.</td>
</tr>
<tr>
<td>Dominance of economic sustainability</td>
<td>Both companies highlighted the need for ES practices to make ‘business sense.’</td>
</tr>
</tbody>
</table>
Factors | Similarities
--- | ---
**House-brand versus branded goods** | Both companies focused on the ES supply chain practices of suppliers of house-brand products.

‘Whole-of-supply-chain’ | Neither company has embraced a ‘whole-of-supply-chain’ responsibility.

**Level of reporting** | Both companies are recognised by NetBalance (an assurance company) as producing comprehensive SRs. The assurance reports by NetBalance, as well as scrutiny of the reports, reflect improvements in reporting over the review period.

**Support Australian suppliers** | Both companies reported support for Australian suppliers. Yet, media reports indicate a tension with suppliers.

**Ethical sourcing policies** | Both companies have ethical sourcing policies, which focus on suppliers of house-brands in foreign countries. Audit procedures and supplier development activities are used to improve the ES practices of these suppliers.

**Consumer** | Both companies mentioned being involved with consumer education efforts related to ES issues.

**Stakeholder interaction** | Both companies claimed to interact with multiple stakeholders about ES issues, such as suppliers, consumers, industry representative organisations, NGOs and government.

As can be seen in Table 13, Woolworths has taken a clear lead in sustainability reporting over Coles.

**Table 13: Differences between the Coles and Woolworths SR data**

<table>
<thead>
<tr>
<th>Factors</th>
<th>Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leadership</strong></td>
<td>Woolworths is recognised as a leader in sustainability performance and reporting by NetBalance.</td>
</tr>
<tr>
<td><strong>GRI rating</strong></td>
<td>Woolworths have received higher GRI ratings than Coles.</td>
</tr>
<tr>
<td><strong>Transparency</strong></td>
<td>Woolworths are more transparent in reflecting the percentage of their products which are branded versus house-brand to enable better interpretation of their claims regarding house-brand products.</td>
</tr>
</tbody>
</table>
The Woolworths SRs are more transparent and explanatory than the Coles SRs. Woolworths seems to market a number of factors, such as health, animal welfare and organics, whereas Coles seem to have more specific and aggressive marketing campaigns, particularly since 2010, on issues such as ‘sow stall free pork’ and ‘A$1 per litre milk.’ Although Woolworths argued these decisions were instigated by Coles, they imitated these policies so as to not lose market share.

The reports suggest the two retailers are influenced by each other, since there is imitation and similarities in the issues addressed. Woolworths seem to engage more with stakeholders than Coles. This is reflected in assurance reports that, over the years, made recommendations to Wesfarmers to engage more with stakeholders. Woolworths acknowledge more responsibility for a whole-of-supply-chain focus, while Coles is silent on this matter.

### 4.8.2 A Comparison between the two large Australian retailers and overseas comparators

Table 14 shows the many similarities between the SR data of the five supermarkets included in this phase of the study. All companies employed substantial and similar intra-organisation ES practices and have long sustainability reporting histories. All companies focused first on intra- and then on inter-organisation ES practices. The dominance of economic over environmental sustainability is indicated by all companies. The focus of all companies is on house-brand products. All companies profess support for local suppliers and follow ethical sourcing policies. The level of reporting was shown to have improved over the review period for all companies. All

<table>
<thead>
<tr>
<th>Factors</th>
<th>Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initiator/Imitator</strong></td>
<td>Coles have been the instigator, and Woolworths the imitator of a number of recent campaigns, such as sow stall free pork.</td>
</tr>
<tr>
<td><strong>Interactions with stakeholders</strong></td>
<td>The assurance reports by Netbalance indicate that Woolworths has more interaction and feedback from stakeholders, whereas this was shown as a recommendation to Coles (Wesfarmers).</td>
</tr>
<tr>
<td><strong>Marketing focus</strong></td>
<td>Coles reports and website indicates emphasis on specific issues, such as animal welfare issues (sow stall free) and health issues (hormone-free beef), whereas Woolworths places emphasis on a wider range of issues.</td>
</tr>
</tbody>
</table>
companies mention a focus on the consumer in addressing ES issues and a multiple stakeholder orientation and interactions.

Table 14: Similarities between Australian and overseas supermarkets

<table>
<thead>
<tr>
<th>Factors</th>
<th>Similarities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intra-organisation practices</td>
<td>All companies focus on similar intra-organisation ES practices.</td>
</tr>
<tr>
<td>Length of sustainability reporting</td>
<td>All companies are similar in the starting dates of comprehensive sustainability reporting.</td>
</tr>
<tr>
<td>Practice priorities</td>
<td>All companies focus first on intra-organisation ES practices and then on green SCM.</td>
</tr>
<tr>
<td>Dominance of economic sustainability</td>
<td>All companies highlight the need for ES practices to make ‘business sense.’</td>
</tr>
<tr>
<td>House-brand versus branded goods</td>
<td>All companies focus ES supply chain practices on suppliers of house-brand products.</td>
</tr>
<tr>
<td>Support for local suppliers</td>
<td>All companies report support for local suppliers.</td>
</tr>
<tr>
<td>Ethical sourcing policies</td>
<td>All companies have ethical sourcing policies.</td>
</tr>
<tr>
<td>Level of reporting</td>
<td>Scrutiny of the SRs and the assurance reports (where available) indicate an improvement in the sustainability reporting over the 10 year period.</td>
</tr>
<tr>
<td>Consumer</td>
<td>All companies mention being involved with educating consumers regarding ES issues.</td>
</tr>
<tr>
<td>Stakeholder interaction</td>
<td>All companies claim to interact with multiple stakeholders regarding ES issues, such as suppliers, consumers, industry representative organisations, NGOs and government.</td>
</tr>
</tbody>
</table>

Table 15 highlights country differences between the supermarkets. It suggests that, by 2013, the overseas supermarkets were embracing a ‘whole-of-supply-chain’ approach ahead of the Australian retailers. As can be seen in Table 15, it seems that
the Australian agrifood industry lags trends in the UK. The UK companies (particularly Sainsbury) showed an early lead in focusing on animal welfare issues.

Table 15: Differences between Australian and overseas supermarkets

<table>
<thead>
<tr>
<th>Factors</th>
<th>Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Whole-of-supply-chain’ and inter-organisation practices</td>
<td>The UK and USA comparative companies articulate ‘whole-of-supply-chain’ responsibility by 2013, whereas the reports of the Australian supermarkets do not indicate this.</td>
</tr>
<tr>
<td>Leadership in ES issues</td>
<td>Australian supermarkets appear to lag the UK companies, supporting interview data.</td>
</tr>
<tr>
<td>Leadership in animal welfare issues</td>
<td>Sainsbury has had a continuous and early focus on animal welfare issues. Thereafter follows Tesco and the Australian supermarkets. Walmart does not emphasize animal welfare issues in the 10 year review.</td>
</tr>
<tr>
<td>GRI rating</td>
<td>The Australian supermarkets have been rated according to GRI 3 series since 2008 (Woolworths) and 2010 (Wesfarmers). The UK companies are not rated. Walmart has been rated since 2012. The Australian supermarkets received a higher rating than Walmart.</td>
</tr>
</tbody>
</table>

The Australian retailers have focused on animal welfare issues since 2010, but Walmart has yet to focus on animal welfare issues. The Australian supermarkets have led in terms of external assurance, since Woolworths has been rated according to GRI 3 series since 2008 and Wesfarmers since 2010. Walmart has been rated since 2012 while the UK companies have never had their SRs independently rated. The Australian supermarkets received a higher rating than Walmart.

4.9 Chapter summary

This Chapter outlined the results of a focused review of the SRs of the Australian supermarkets and a small number of UK and USA comparator supermarkets. The review focused on trends in ES issues, intra-organisation ES practices and inter-organisation ES practices, with a particular focus on whether a whole-of-supply-chain responsibility was being adopted. The Chapter provides a comparison between the Woolworths and Coles SR data, as well as a cross-country comparison between the Australian, UK and USA retailers included in the study. The purpose of the
focused review was to better understand the role played by Coles and Woolworths in the three case studies presented in Chapter 5. The review also assisted in identifying relevant events related to the processes of spread of ES practices in the three case studies (since the Australian SRs mention significant legislation, projects and actors etc.). Further, the review allowed for triangulation of the case studies’ interview and documentary data. Next, Chapter 5 presents the results and analysis of the three cases studies in the WA pork and dairy industries.
CHAPTER 5 - RESULTS AND ANALYSIS

5.1 Introduction

This Chapter presents and analyses the results of the three case studies that were undertaken in the WA agrifood sector (two in the WA pork industry (Case A1 and A2) and one in the WA dairy industry (Case B)). Sections 5.2 and 5.3 present the findings from the WA pork industry case studies and section 5.4 the dairy industry case study. The data in the WA pork industry shows that some of the processes of spread relating to ES practices differ from the processes concerning a particular group of animal welfare practices, namely ‘sow stall free’ practices. Thus, the processes of spread relating to these two groups of practices are discussed as two embedded case studies, namely the spread of ES practices in the WA pork industry (Case A1) and the spread of sow stall free practices in the WA pork industry (Case A2). For each of the three cases the relevant events, processes of spread and factors influencing spread are presented. Thereafter, the data relating to the characteristics of ES practices influencing their spread is discussed in section 5.6. The cross-case comparisons are discussed in Chapter 6. The next section presents and analyses the spread of ES practices in the WA pork industry.

5.2 Case A1: WA pork industry – spread of ES practices

5.2.1 Introduction

The following sections provide a brief background of the WA pork industry, details of the WA pork network actors in the study and an overview of their interactions. The following figure offers a key to interview quotations.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>[]</td>
<td>Indicates the researcher adding in an explanation.</td>
</tr>
<tr>
<td>[...]</td>
<td>Means that some of the conversation has been cut out since it is not relevant to the point being made.</td>
</tr>
<tr>
<td>…</td>
<td>Indicates a pause in conversation.</td>
</tr>
</tbody>
</table>

Figure 10: Key to quotations from interview transcripts
5.2.2 Brief background of WA pork industry

Pork is the most widely consumed animal protein in the world (APL 2014a). The Australian farm-gate value of pork is around a billion Australian dollars (APL 2014b). The national pork supply chain is valued at A$3.5 billion and employs more than 33,000 people (APL 2014a). Most of the pig meat produced in Australia (87%) is consumed domestically, while the remainder is exported, predominantly to Singapore, New Zealand and Hong Kong (APL 2014a). During 2010-11, pork products accounted for around 10% of Australia’s total fresh meat retail consumption (APL 2014a).

It is illegal to import fresh pork into Australia due to quarantine regulations protecting Australia against diseases (APL 2013b); this provides protection for the national fresh pork industry. Import restrictions on processed pork (e.g. ham, salami, frozen pork) entering Australia were recently relaxed, resulting in a significant decrease in domestic processed pork production (Res21 2012). Approximately 70% of processed pork is imported (Res21 2012), mainly from the USA, Canada and Denmark (USDA Foreign Agricultural Service 2010).

The WA pork industry represents 12% of the Australian pork industry (DAFWA 2014b). The farm-gate value of WA pork is approximately A$130 million and the industry employs 1,500 people along the supply chain (DAFWA 2014b). Most WA pork produced is sold as fresh pork in the domestic market, although 20% is exported to Singapore (DAFWA 2014b). The pork industry in WA is smaller than other food industries, such as live cattle, live sheep, beef meat and sheep meat (DAFWA 2012b). The WA pork industry is small by international standards and, like many pork-producing countries, there has been a decline in breeder numbers in recent years (DAFWA 2013a), with an increasing number of pigs being grown under contract with the processing sector (DAFWA 2014b). Little pork processing is undertaken in WA.

5.2.3 WA pork network actors

The relevant actors in the WA pork network are shown in Figure 11. ‘Relevance’ is based on interviewees’ perceptions of relevant actors, the documentary review and a ‘double sense-making’ process. In Figure 11, the traditional supply chain is shown as
blue circles, government organisations in light orange squares, industry representative organisations in dark green hexagons, support organisations in dark orange circles, not-for-profit organisations as pink diamonds and media and other actors as light green circles.

**Figure 11: Actors in the WA pork network**

In Figure 11, the WA pork traditional supply chain shows the flow of product, starting with suppliers of farmers (e.g. feed, water and chemicals) then to farmers, to pork processors, to retailers, consumers and thereafter to end-of-life organisations. The WA pork industry has two large producers, OrgA and OrgB (both family-owned), each producing 40% of the fresh pork market in WA, after which the size of piggeries decreases quickly (Res21 2012).

Pork processors include WA’s largest pig abattoir (owned by OrgA), which slaughters about 95% of WA pigs (Res21 2012). There are also a number of small to medium pork smallgoods producers, often family-owned (such as OrgC). Since much of the processed pork is imported, international processed pork suppliers are
relevant actors. WA retailers of pork include the large supermarkets (Coles and Woolworths), the IGA supermarket chain, butcheries, fast food sector, restaurants, as well as international buyers. A key feature of the WA agrifood network, as with the rest of Australia, is the domination of the sector and supply chains by the large supermarkets (Coles and Woolworths) that cater for 70% of the food retail market (IBISWorld 2013). In WA, IGA, a chain of independent supermarkets, is also a significant supermarket actor. The end-of-life organisations include recycling organisations and a rendering plant (owned by OrgA) that processes unused animal by-products into tallow.

As shown in Figure 11, government departments relevant to the spread of ES practices in the WA pork industry include organisations at an Australian, state and local level. At the Australian level, departments playing a role in ES are the Department of Sustainability, Environment, Water, Population and Communities, the Department of Climate Change and Energy, the Department of Agriculture, Fisheries and Forestry (DAFF) and the Department of the Environment (DoE). At the state level, relevant departments include the Department of Environment Regulation (DER) (formerly (up until June 2013) part of the Department of Environment and Conservation (DEC)), the Department of Water (DoW), the Department of Planning (DoP), the Environmental Protection Authority, Minister of the Environment and the Department of Agriculture and Food (DAFWA). DAFWA have units dedicated to supporting various WA industries, such as the ‘Pork Innovation Group’, which conducts research in the WA pork industry. In 2013 WA had 140 local governments which are represented by the Western Australia Local Government Association (WALGA).

Industry organisations represent the pork industry at a national and state level. At a national level, the pork industry is represented by Australia Pork Limited (APL) and the National Farmers’ Federation (NFF). APL is a producer-owned company funded mainly through statutory pig slaughter levies and research-specific funds provided by the Australian Government (APL 2013a). At a state level, the pork industry is represented by the Western Australia Pork Producers Association (WAPPA), The WA Pork Innovation Hub and the WA Farmers’ Federation (WAFF).
The support organisations shown in Figure 11 include farm consultants, green specialist companies, logistics providers, environmental assurance companies, food service and distribution companies and so forth. Farm consultants offer productivity and economic advice to farmers and are represented by the Australian Association of Agricultural Consultants (WA) Inc. (AAAC). The not-for-profit organisations include animal welfare organisations (e.g. Animals Australia), environmental activist organisations (e.g. Planet Ark), consumer organisations and other community organisations.

The ‘other organisations’ shown in Figure 11 include universities and other research institutions, the Australian and UK media and celebrities, which interviews indicate as having an impact on the spread of ES practices in the WA pork network. Finally, local and international end consumers are shown in Figure 11. For all these organisations, their international counterparts are also relevant (e.g. the international suppliers of processed pork are competitors to the local WA pork producers and processors).

The WA and Australian pork industry has a small number of key actors, as indicated by Res6 (farm consultant and former DAFWA official) who was told by an Australian Government official that “at the national level, I can make 17 phone calls and I’ve got 80% of my pork supply covered.” Res6 suggested the limited number of farmers meant change can be spread more quickly in the national pork industry than some other agrifood industries (such as the dairy industry that has a large number of actors). Res6 commented that profit is the pork industry’s “number one driver and because they have got profit they are able to employ good animal welfare practices, good environmental practices, they are able to pay staff really well you know, they are able to generate income for their community, they are able to put into national marketing campaigns, all that sort of stuff that they need to do as a whole of industry.” Thus, Res6 suggested the WA pork industry has the resources to employ ES practices.

5.2.4 Details of pork network actors studied

Table 16 shows the actors studied in the WA pork network and details of whether interviews and/or documentary evidence were obtained. Data was collected from
representatives of the major organisation types in the WA pork network, which ensured a multi-perspective view of the processes of ES spread in the WA pork industry.

**Table 16: Details of pork network actors studied**

<table>
<thead>
<tr>
<th>Actor type</th>
<th>Organisation</th>
<th>Interview</th>
<th>Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Supply chain companies:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feed suppliers:</td>
<td>OrgD (large agrigroup)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Pork producers:</td>
<td>OrgA (large agrigroup)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>OrgB (large pork producer)</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>OrgD (large agrigroup)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Pork processors:</td>
<td>OrgC (medium smallgoods processor)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>OrgE (small butcher)</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OrgF (small butcher)</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OrgA (abbatoir)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Retailers:</td>
<td>Woolworths (large retailer)</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Coles (large retailer)</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>IGA (large retailer)</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>OrgJ (large independent supermarket, part of IGA)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>OrgE (small butcher)</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OrgF (small butcher)</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>End-of-life:</td>
<td>OrgA (rendering plant)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>OrgI (recycling)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Actor type</td>
<td>Organisation</td>
<td>Interview</td>
<td>Documents</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td><strong>Government:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Australian:</td>
<td>Department of Agriculture, Fisheries and Forestry (DAFF), Department of the Environment (DoE)</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>State:</td>
<td>WA Department of Agriculture and Food (DAFWA) (including the Pig Innovation Group)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Department of Environment Regulation (DER) (formerly part of the Department of Environment and Conservation (DEC))</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Department of Water (DoW)</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Department of Planning (DoP)</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Local:</td>
<td>Western Australia Local Government Association (WALGA)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Industry representative organisations:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>National:</td>
<td>Australia Pork Limited (APL)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Australian Association of Agricultural Consultants (WA) Inc. (AAAC)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>National Farmers’ Federation (NFF)</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>State:</td>
<td>Western Australia Pork Producers Association (WAPPA)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Western Australia Farmers’ Federation (WAFF)</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Actor type</td>
<td>Organisation</td>
<td>Interview</td>
<td>Documents</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------------------------------------------------------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td><strong>Support organisations:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farm consultants</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>OrgK (green specialist company)</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>OrgI (logistics company)</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>OrgG (food service and distribution)</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>OrgH (food service and distribution)</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>OrgQ (cleaning chemical supplier to food industry)</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Other:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jamie Oliver (celebrity)</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>UK press (media)</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Australian press (media)</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Animals Australia (not-for-profit)</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Planet Ark (not-for-profit)</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

Table 17 provides details of the interviewees common to the three case studies, together with the organisations they represent, interviewee details and the interview type used (face-to-face or by telephone). Table 18 shows details of interviewees specific to the pork industry.
<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Organisation</th>
<th>Type of organisation</th>
<th>Interviewee details</th>
<th>Interview type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Res1</td>
<td>WA Department of Agriculture and Food (DAFWA)</td>
<td>State government</td>
<td>Director, DAFWA</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res2</td>
<td>DAFWA</td>
<td>State government</td>
<td>Director, DAFWA</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res3</td>
<td>DAFWA, Organics</td>
<td>State government</td>
<td>Development officer, DAFWA</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res4</td>
<td>DAFWA, food market development</td>
<td>State government</td>
<td>Manager, DAFWA</td>
<td>Telephone</td>
</tr>
<tr>
<td>Res5</td>
<td>DAFWA</td>
<td>State government</td>
<td>Leader, DAFWA</td>
<td>Telephone</td>
</tr>
<tr>
<td>Res6</td>
<td>Farm consultant, formerly with DAFWA</td>
<td>Farm consulting company / State government</td>
<td>DAFWA, thereafter farm consultant</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res7</td>
<td>Department of Environment and Conservation (DEC) (later Department of Environment Regulation (DER))</td>
<td>State government</td>
<td>Director of Environmental Regulation</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res8</td>
<td>DEC (later DER)</td>
<td>State government</td>
<td>Strategic Policy and Programmes</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res9</td>
<td>Western Australia Local Government Association (WALGA)</td>
<td>Association representing local government councils</td>
<td>Deputy Chief Executive Officer</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res10</td>
<td>WALGA</td>
<td>Association representing local government councils</td>
<td>Executive manager - Environment and waste</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res11</td>
<td>Farm consultant / Australian Association of Agricultural Consultants (WA) Inc. (AAAC)</td>
<td>Farm consulting company / AAAC</td>
<td>Management consultant</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Interviewee</td>
<td>Organisation</td>
<td>Type of organisation</td>
<td>Interviewee details</td>
<td>Interview type</td>
</tr>
<tr>
<td>-------------</td>
<td>---------------------------------------------------</td>
<td>----------------------</td>
<td>---------------------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Res12</td>
<td>Western Australia Farmers’ Federation (WAFF)</td>
<td>Industry representative organisation</td>
<td>Director of Policy</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res13</td>
<td>Large independent supermarket (OrgJ)</td>
<td>Retailer</td>
<td>Owner manager</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res14</td>
<td>Organic vegetable farmer and retailer</td>
<td>Retailer/farmer</td>
<td>Owner, partner of farmer</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res15</td>
<td>Food service, seafood distributors, ship suppliers</td>
<td>Food service and distribution</td>
<td>Chief executive officer</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res16</td>
<td>Food service and distribution</td>
<td>Food service and distribution</td>
<td>General manager of division (2 interviews)</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res17</td>
<td>Food service and distribution</td>
<td>Food service and distribution</td>
<td>Special Projects Co-ordinator</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res18</td>
<td>Logistic provider, recycling (OrgI)</td>
<td>Logistics provider, recycling</td>
<td>Director</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res19</td>
<td>Curtin University and DAFWA</td>
<td>University, DAFWA</td>
<td>Lecturer, worked on ‘Farming for the Future’ initiative</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res20</td>
<td>Green specialist company</td>
<td>Green specialist company</td>
<td>Consultant</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Interviewee</td>
<td>Organisation</td>
<td>Type of organisation</td>
<td>Interviewee details</td>
<td>Interview type</td>
</tr>
<tr>
<td>------------</td>
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<td>---------------</td>
</tr>
<tr>
<td>Res21</td>
<td>WA Department of Agriculture and Food (DAFWA), Pork Innovation Group</td>
<td>State government</td>
<td>Development Officer. Worked in the pig industry in a research capacity for over 20 years.</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res22</td>
<td>DAFWA. Pork Innovation Group.</td>
<td>State government</td>
<td>Director, Livestock Industries Innovation</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res23</td>
<td>Western Australia Pork Producers Association (WAPPA)</td>
<td>Industry representative organisation</td>
<td>Executive officer</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res24</td>
<td>Largest integrated agrigroup in WA (OrgD)</td>
<td>Large agrigroup</td>
<td>General manager of division at OrgD. Executive Board member of Australia Pork Ltd.</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res25</td>
<td>Small butcher (Org E)</td>
<td>Small butcher</td>
<td>Owner and manager</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res26</td>
<td>Small butcher (Org F)</td>
<td>Small butcher</td>
<td>Butcher</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res27</td>
<td>Large WA agrigroup. Farming, abattoir, rendering plant. Family-owned (OrgA)</td>
<td>Large agrigroup</td>
<td>Executive Director. Corporate Social Responsibility &amp; Credit Control Manager.</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res28</td>
<td>Smallgoods processor, family-owned, 450 staff (OrgC)</td>
<td>Food processor</td>
<td>Chief engineer. Contact for Australian Packaging Covenant. General manager of division.</td>
<td>Face-to-face</td>
</tr>
</tbody>
</table>
For clarity Table 19 provides a summary of the interviewees and interview statistics.

Table 19: Summary of interviewee and interview statistics

<table>
<thead>
<tr>
<th></th>
<th>Pork cases (A1 and A2)</th>
<th>Dairy case (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total number of interviewees</strong></td>
<td>28 interviews (20 interviewees related to the pork and dairy cases; 8 related to the pork industry)</td>
<td>26 (20 interviewees related to the pork and dairy cases; 6 related to the dairy industry)</td>
</tr>
<tr>
<td><strong>Total number of interviews</strong></td>
<td>25 interviews (17 common; 8 related to the pork industry)</td>
<td>24 interviews (17 common; 7 related to the dairy industry)</td>
</tr>
<tr>
<td><strong>Total number of organisations represented</strong></td>
<td>19 organisations (12 common; 7 related to the pork industry)</td>
<td>17 organisations (12 common; 5 related to the dairy industry)</td>
</tr>
</tbody>
</table>

For ease of reference, Table 20 provides a listing and description of the organisations discussed frequently in the pork case studies (A1 and A2).

Table 20: Listing of organisations for ease of reference

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OrgA</td>
<td>Large agrigroup. Family-owned. Owns five pig farms, abattoir, rendering plant.</td>
</tr>
<tr>
<td>OrgB</td>
<td>Large pig farmer.</td>
</tr>
<tr>
<td>OrgC</td>
<td>Smallgoods processor. Family-owned, 450 staff.</td>
</tr>
<tr>
<td>OrgD</td>
<td>Largest integrated agrigroup in WA.</td>
</tr>
<tr>
<td>OrgE</td>
<td>Small butcher.</td>
</tr>
<tr>
<td>OrgF</td>
<td>Small butcher.</td>
</tr>
<tr>
<td>OrgG</td>
<td>Food service, seafood distributors, ship suppliers. Large, family-owned.</td>
</tr>
<tr>
<td>OrgH</td>
<td>Large international food services and distribution company.</td>
</tr>
<tr>
<td>OrgI</td>
<td>Logistics provider, recycling.</td>
</tr>
<tr>
<td>OrgJ</td>
<td>Large independent supermarket, part of IGA chain.</td>
</tr>
<tr>
<td>OrgK</td>
<td>Green specialist company.</td>
</tr>
<tr>
<td>OrgQ</td>
<td>Cleaning chemical supplier to the food industry.</td>
</tr>
<tr>
<td>DAFWA</td>
<td>WA Department of Agriculture and Food.</td>
</tr>
</tbody>
</table>
5.2.5 Overview of interactions between the actors in Case A1

The following section discusses the interactions between the actors in Case A1. The two large WA pork producers (OrgA and OrgB) are competitors. OrgA has multiple businesses, while OrgB is only a pork producer. OrgA is a large, family-owned business with a long history in Australia. OrgA’s businesses include five pig farms, the State pig abattoir and a rendering plant. OrgA’s abattoir operations slaughter pigs from OrgB and OrgD (large agribusiness). OrgA supplies Coles, Woolworths and OrgC (smallgoods manufacturer), among others, and exports a small amount. OrgA has used OrgK, a green specialist company, to prepare data for the Australian Government’s National Greenhouse and Energy Reporting (NGER) scheme reporting requirements. OrgA uses logistics and recycling company, OrgI, to transport waste meat to OrgA’s rendering plant. OrgA requires licences to operate their piggery and rendering plant and, thus, interacts directly with the DER (the regulator).

OrgA has been proactive in the ‘sustainability’ area and has produced internal sustainability reports for shareholders and have applied for and won a number of environmental awards (Res27 2012). OrgB has had recent negative media attention about animal welfare practices and was fined A$225,000 for breaches of the Animal Welfare Act 2002 (DAFWA 2013b).

OrgC is the largest food manufacturer of smallgoods (such as ham and salami) in WA. It is family-owned and has around 450 employees. OrgC sources pork from
OrgA as well as processed pork from international suppliers. OrgA is OrgC’s biggest supplier (Res28 2012). OrgC supplies processed pork smallgoods to Coles, but Woolworths is its biggest customer (Res28 2012).

OrgD is one of WA’s largest agrifood groups, involved with animal feed, grain, cattle, poultry and pigs. Their marketing edge is high animal welfare standards and their products include free range pork and chicken and grass-fed beef (Res24 2012). All OrgD products are consumed in WA (Res24 2012). OrgD supplies a range of customers, including Coles, Woolworths, IGA and small butchers (Org E and OrgF). They consider all pork producers (except OrgA) as “friends” and “not competitors” because “we only have one competitor and that is [OrgA]” (Res24 2012).

OrgE and OrgF are small butchers with a focus on high quality and high animal welfare products. They sell products supplied by OrgA and OrgD. OrgI is a logistics provider and recycler. OrgI’s logistics division transports meat by-products to OrgA’s meat recycling plant from butchers, OrgC, Woolworths, IGA, abattoirs and others (Res18 2012). OrgI’s logistics division has been in business for 45 years and the cardboard, paper and plastic recycling division has operated for six years (Res18 2012).

OrgJ is an independent supermarket (part of the IGA chain) that purchases products from OrgA and OrgD. OrgG and OrgH are food service and distribution companies; OrgG is family-owned, while OrgH is a large multinational company. Interviewees agreed that the large supermarkets dominate the WA agrifood sector (Res1 2012; Res2 2012; Res21 2012; Res24 2012; Res27 2012; Res30 2013; Res32 2013; Res34 2013).

At a state level, DAFWA, DoW, DER and DoP play important roles in the WA pork network. DER is the “regulator” (Res12 2013) and has been referred to as “the stick” (Res2 2012). DER issues and monitors compliance with licences (e.g. piggeries, abattoirs and the rendering plant). DAFWA (together with its Pork Innovation Group) is seen as a “helping hand” (Res21 2012) and often acts as an intermediary between DER and piggeries. DAFWA has, at times, sought to “train” DER staff to explain issues specific to the pork industry and to make the legislation more industry specific (Res22 2012). The DoW is important in dealing with the treatment of water.
used in processes, such as those in abattoirs that clean equipment. Such processes require a lot of water that needs to be treated before being allowed to enter the environment (Res27 2012). The DoP is significant to the pork industry as piggeries are an ‘offensive trade’ in the WA Health Act 1911 (Res21 2012) and, so, community interests need to be protected in deciding where and how piggeries operate.

Local governments and regional councils, such as the Southern Metropolitan Regional Council (SMRC), deal with waste (Res9 2013; Res10 2013). In 2013 there were 140 WA local governments represented by the Western Australian Local Government Association (WALGA). WALGA interacts with DER to address some ES issues, such as the management of feedlots (Res10 2013). Res9 from WALGA explained that there appears to be a political divide at the state and local council level regarding ‘sustainability’ and that the WA State sustainability strategy has encountered obstacles. Res9 (2013) explained that the concept of ‘sustainability’ is a “high-end intellectual issue in the elected sphere,” which is not easily sellable to voters. Res10 from WALGA suggested WALGA has had more successful interactions with the Australian Government than with the WA State Government about sustainability initiatives, as the Australian Government “has been useful at actually funding programs without mandating them but making them attractive for local governments to participate in; but again those programmes come and go with government.”

The WA farmers’ representative organisation (WAFF) interacts with DER and describes their relationship with the DER as: “I am always one for collaboration - collaborative approaches. But I won't sit here and tell you that there are not … no tensions between farmers and DEC [now DER] officers. Of course there is” (Res12 2013). From the DER’s perspective, Res7 argued: “we have a collaborative approach; we try to work more in partnership with the industries and the premises. That’s not to say that we know that we are the regulator and I will have no qualms in drawing the line, if you cross that line…” (Res7 2013).

Res12 of WAFF reports “a lot of interaction” with DAFWA (Res12 2013). Res12 commented that the research side of DAFWA is very useful, yet believes DAFWA’s “focus has moved clearly away from research and development and extension …[]…
They are more about centres for economic development and that sort of stuff” (Res12 2013). WAFF are part of the National Farmers’ Federation (Res12 2013) which Res12 believes is “important because particularly in the food industry which is a federally regulated industry, you need to have national representation because you can't influence from over here [WA]” (Res12 2013).

At a national level, APL play a significant role in the pork network and has been involved with government and industry in developing industry-specific regulations and guidelines (Res21 2012). At a state level, WAPPA interacts with the DAFWA Pig Innovation Group, local government, APL, producers and animal welfare groups (Res23 2012).

An important group of actors in the WA pork industry are the farm consultants (Res1 2012; Res19 2012; Res6 2013; Res12 2013). They are intermediaries between farmers and government, as well as between farmers and banks (Res11 2012). In recent times, WA government departments have interacted with farmers indirectly through their farm consultants (Res1 2012). Res12 noted “good consultants probably influence farm practice quite a lot” (Res12 2013) and, so, are an important group here. International actors also play an important role in the WA pork industry. Interviewees noted the influence of the British pork industry, suggesting the Australian (and WA) pork industry lagged trends in the British pork industry by five to ten years (Res5 2012; Res17 2012; Res21 2012; Res24 2012).

5.2.6 Events relating to the processes of spread of ES practices in the WA pork industry

As discussed in Chapter 3, a process is a sequence of events unfolding over time (van de Ven & Poole 1995). Thus, to understand the processes of spread of ES practices in the WA pork industry it was necessary to identify events that were directly and indirectly relevant to the spread of ES practices. To identify these events, it is useful to consider the history of the WA pork industry, including the development of relevant legislation, regulations, guidelines and projects. Data from interviews and the review of sustainability reports (Chapter 4) suggested the processes of spread of ES practices in the WA pork industry were influenced by events occurring at international, Australian, state (WA), industry and organisational levels.
Table 21 provides a summary of events relevant to the processes of spread. The events were identified through the analysis of the interview data and the 10 year supermarket review discussed in Chapter 4, media reports and other documents. The table does not include all relevant events but, rather, the events emerging from the data. The ‘relevance’ of the events was based on interviewees’ perspectives, documentary analysis, media reports and the double sense-making process (Halinen et al. 2013).

Table 21 shows time in column A and relevant events emerging at international (column B), national Australian (column C), WA state (column D) and WA pork industry (column E) levels. Many of the events in columns B to E are macro-events that are made up of sequences of other events. For example, event D1.1 (column D, row 1, item 1) (the enactment of the WA Health Act) would have emerged from a sequence of other events involved with its development and enactment (i.e. a process). Table 21 is a form of a narrative sequence map (Buttriss & Wilkinson 2004, 2006), as discussed in Chapter 3. It is noteworthy that the interviewees and industry documents did not mention any environmental disaster events in the WA pork industry (or in the agrifood sector in general), as may have been expected as ‘trigger’ events.
Table 21: Events relevant to the spread of ES practices in the WA pork industry

<table>
<thead>
<tr>
<th>Year</th>
<th>International level</th>
<th>Australian level</th>
<th>WA state level</th>
<th>WA pork industry level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1911</td>
<td></td>
<td>1) WA Health Act.</td>
<td>1) In the Health Act the piggery is defined as an “offensive trade.” 2) Local governments control how piggeries are run.</td>
</tr>
<tr>
<td>2</td>
<td>Up to 1960</td>
<td></td>
<td></td>
<td>1) Pigs are a sideline industry compared to wheat, sheep and dairy (Res21 2012).</td>
</tr>
<tr>
<td>3</td>
<td>From 1960</td>
<td></td>
<td></td>
<td>1) Larger and more intensive piggeries attract the attention of regulators (Res21 2012).</td>
</tr>
<tr>
<td>5</td>
<td>1986</td>
<td></td>
<td>1) Environmental Protection Act.</td>
<td></td>
</tr>
<tr>
<td>Year</td>
<td>International level</td>
<td>Australian level</td>
<td>WA state level</td>
<td>WA pork industry level</td>
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<tr>
<td>------</td>
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<tr>
<td>6</td>
<td>1987</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(A)</td>
<td>(B)</td>
<td>(C)</td>
<td>(D)</td>
</tr>
<tr>
<td></td>
<td>1) UN ‘Brundtland Report.’</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2) Start of the era of sustainability (DEC 2003).</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>3) UN Montreal Protocol on Substances that Deplete the Ozone Layer.</td>
<td></td>
<td></td>
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<tr>
<td>7</td>
<td>1989</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(A)</td>
<td>(B)</td>
<td>(C)</td>
<td>(D)</td>
</tr>
<tr>
<td></td>
<td>1) ‘WA Environmental Management Guidelines For Animal Based Industries - Piggeries.’</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>1989-1991</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(A)</td>
<td>(B)</td>
<td>(C)</td>
<td>(D)</td>
</tr>
<tr>
<td></td>
<td>1) Start of the ‘Decade of Landcare’ programme.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2) Australia developed the ‘National Strategy for Ecologically Sustainable Development.’</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>1991-1992</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(A)</td>
<td>(B)</td>
<td>(C)</td>
<td>(D)</td>
</tr>
<tr>
<td></td>
<td>1) UN World Commission on Environment and Development (the Brundtland Commission).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2) UN begins a long-term project to make the global economy more sustainable (DEC 2003).</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Year</td>
<td>International level</td>
<td>Australian level</td>
<td>WA state level</td>
<td>WA pork industry level</td>
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<tr>
<td>(A)</td>
<td>(B)</td>
<td>(C)</td>
<td>(D)</td>
<td>(E)</td>
</tr>
<tr>
<td>10</td>
<td>1992</td>
<td>1) Agenda 21 (a detailed action plan for the 21st century) agreed at the UN Conference on Environment and Development held in Rio de Janeiro, Brazil (DEC 2003).</td>
<td>1) All Australian state and territory governments agree to the ‘Intergovernmental Agreement on the Environment’ - to provide for a cooperative national approach to the environment (DEC 2003).</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>1995</td>
<td>1) Start of the development of the National Environment Protection (National Pollutant Inventory) Measure (NPI NEPM).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>1997</td>
<td>1) Kyoto Protocol agreement under the UN Framework Convention on Climate Change. 2) Formation of GRI.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>1998</td>
<td>1) NPI NEPM comes into effect on 27 Feb.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year</td>
<td>International level</td>
<td>Australian level</td>
<td>WA state level</td>
<td>WA pork industry level</td>
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<tr>
<td></td>
<td>(A)</td>
<td>(B)</td>
<td>(C)</td>
<td>(D)</td>
</tr>
<tr>
<td>16</td>
<td>2000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year</td>
<td>International level</td>
<td>Australian level</td>
<td>WA state level</td>
<td>WA pork industry level</td>
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<tr>
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<td>(A)</td>
<td>(B)</td>
<td>(C)</td>
<td>(D)</td>
</tr>
<tr>
<td>20</td>
<td>2004</td>
<td></td>
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<td></td>
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<tr>
<td>21</td>
<td>2005</td>
<td></td>
<td></td>
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<tr>
<td>22</td>
<td>2006</td>
<td></td>
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<tr>
<td>23</td>
<td>2007</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>National Greenhouse and Energy Reporting Act (NGER Act).</td>
<td>1) ‘Farming for the Future’ project (cont.).</td>
<td>1) FFF pork</td>
<td>1) FFF pork</td>
</tr>
<tr>
<td>Year</td>
<td>International level</td>
<td>Australian level</td>
<td>WA state level</td>
<td>WA pork industry level</td>
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<td>------</td>
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<td>-----------------------</td>
</tr>
</tbody>
</table>
2) UN Copenhagen Climate Change Conference. | 1) National environmental sustainability strategy for pork industry.  
2) Carbon Pollution Reduction Scheme Green Paper outlining a cap-and-trade emissions trading scheme (ETS).  
3) Report of the Garnaut Review released. | 1) Farming for the Future project (cont.).  
2) Farming for the Future industry practice baselines issued in Dec.  
3) WA ‘Walking the walk on environmental assurance’ project. | 1) FFF pork.  
2) ‘FFF industry practice baselines pork’ issued in Dec. |
| 26   | 2010                | 1) UN Cancun Climate Change conference. | 1) Australian Packaging Covenant.  
2) ‘National environmental guidelines for piggeries’ (updated).  
3) Start of the update of the 2008 Garnaut Climate Change Review.  
4) The passing of ‘The Carbon Pollution Reduction Scheme Bill 2010’ lapsed at the Senate due to the calling of national elections. |  |
<table>
<thead>
<tr>
<th>Year</th>
<th>International level</th>
<th>Australian level</th>
<th>WA state level</th>
<th>WA pork industry level</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>2011</td>
<td>1) GRI 3 series food processing sector supplement.</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>1) Australian Government announces ‘Clean Energy Future’ plan including carbon price and Land Sector Package.</td>
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<td></td>
<td></td>
<td>2) The Carbon Credits (Carbon Farming Initiative) 2011 (CFI Act) passed by Parliament.</td>
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<td></td>
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<td>3) Clean Energy Act.</td>
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<tr>
<td>Year</td>
<td>International level</td>
<td>Australian level</td>
<td>WA state level</td>
<td>WA pork industry level</td>
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<td>------------------------</td>
</tr>
<tr>
<td>28</td>
<td>2012</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1) UN Rio + 20 Earth Summit.</td>
<td>1) Land sector package which includes the Carbon Farming Futures and ‘Regional Natural Resource Management’ (NRM) Planning for Climate Change Fund commences. 2) Amendments to the CFI regulations come into force on 29 May. 3) Introduction of ‘carbon pricing scheme’ from 1 July (under the Clean Energy Act 2011). 4) Implementation of Australian Government’s ‘Clean Energy Future’ legislative package. 5) Biogas success story - Blantyre Farms (piggery) successfully returns electricity to grid and first to get carbon credits from the Carbon Farming Initiative.</td>
<td>1) DAFWA’s Agrifood 2025+ initiative.</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>2013</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1) GRI 4 series published.</td>
<td>1) Attempt to repeal the carbon pricing scheme. 2) Under development: ‘National environmental guideline for free range and outdoor grown piggeries’ (Res21 2012).</td>
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<td></td>
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<tr>
<td>Year</td>
<td>International level</td>
<td>Australian level</td>
<td>WA state level</td>
<td>WA pork industry level</td>
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<tr>
<td>30</td>
<td>2014</td>
<td></td>
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<tr>
<td></td>
<td>1) UN Climate Change Conference held from 4 to 15 June in Bonn, Germany, as governments work towards a new agreement in Paris in 2015 (UN Framework Convention on Climate Change 2014).</td>
<td>1) Attempt to repeal carbon pricing scheme. 2) April - Australian Government release the white paper on Direct Action Climate Change Plan which includes a A$2.5 billion emissions reduction fund (ERF) which is slated to start 1 July and will pay industries for activities that reduce carbon emissions (ABC news 2014). 3) July. Carbon pricing scheme repealed.</td>
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<td></td>
<td>2) UN Summit on Climate Change in New York.</td>
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<td>31</td>
<td>2015</td>
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<td></td>
<td>1) Planned UN Framework Convention on Climate Change (UNFCCC) in Paris to reach agreement that will take effect from 2020.</td>
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</tbody>
</table>
5.2.6.1 Events at the international and Australian level (columns B and C)

As shown in column B in Table 21, although there were events such as the UN Conference on the Human Environment in 1972, the world’s focus on ‘sustainability’ gained momentum from 1987 with the UN’s ‘Brundtland report’ that highlighted a potential conflict between pursuing economic growth and maintaining the environment and introduced the now well-known term - ‘sustainable development’ (WCED, 1987).

The Brundtland report marked the start of the ‘era of sustainability’ (DEC 2003). International agreements, such as the UN Montreal Protocol on Substances that Deplete the Ozone Layer (1987), show attempts to address ES issues at an international level. The 1990s saw the start of the Brundtland Commission (1991-1992). Events such as the UN Agenda 21 in 1992 (a detailed action plan for the 21st century) and the Kyoto Protocol in 1997 (an agreement under the UN Framework Convention on Climate Change) demonstrate attempts in the 1990s at world cooperation to combat threats to sustainability. Success was hindered by major polluting nations, such as the USA and China, refusing to sign the Kyoto Protocol (O’Malley 2014). The UN continues to bring nations together to address ES issues, such as the conferences in 2002, 2009, 2010, 2012 and 2014 (as seen in column B of Table 21). The recent global financial crisis (GFC) is a further significant global event influencing international and national approaches to ES issues.

The UN is working towards a meeting in 2015 in Paris, where it is hoped 195 countries will make voluntary pledges on carbon gases and that financial aid will be provided to poorer countries (news24.com 2014). Challenges in the 2014 Bonn negotiations include richer nations focusing on carbon mitigation (i.e. reducing emissions), while poorer nations are focusing on assistance for climate change adaption (i.e. addressing the effects of carbon emissions that have already occurred). While these events display global recognition of ES issues and many attempts to improve ES, there is a lack of consensus about how to manage global ES issues.

Against this international backdrop, Column C of Table 21 shows Australia has been proactive in international climate change initiatives and other sustainability issues by developing national strategies, laws and regulations. The Australian Government
supports international agreements such as the United Nations Montreal Protocol on Substances that Deplete the Ozone Layer (1987) and the Kyoto Protocol (1997) (Department of Foreign Affairs and Trade 2013). At a national level, Australia developed the ‘National Strategy for Ecologically Sustainable Development’ as early as 1989.

In 1989, the then Prime Minister announced the Australian Government’s support for Landcare with the establishment of the ‘Decade of Landcare’ and the National Landcare Programme (DAFF 2009). Landcare funding provides investment at a national, regional and local level to assist farmers, landholders and community groups in undertaking on-ground sustainable agricultural and environmental actions (DAFF 2009). In 1995, the Australian Government began the National Environment Protection (National Pollutant Inventory) Measure (NPI NEPM), which provides the community, industry and government with free information about substance emissions.

In 1999, the ‘Environment Protection and Biodiversity Conservation Act 1999’ (EPBC Act) was enacted. The EPBC Act is the Australian Government’s central piece of environmental legislation, providing a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places that are defined as matters of national environmental significance (Department of the Environment 2013). Further Australian Government legislation affecting ES practices include the Energy Efficiency Opportunities Act 2006 (EEO Act) and the National Greenhouse and Energy Reporting Act 2007 (NGER Act). The NGER Act introduced a framework for the reporting and dissemination of information about greenhouse gas emissions, greenhouse gas projects, as well as corporate energy use and production.

The Garnaut Climate Change Review (2008) examined climate change’s impacts on the Australian economy and the Australian Government released a Carbon Pollution Reduction Scheme (CPRS) Green Paper (a cap-and-trade emissions trading scheme) designed to reduce Australia’s greenhouse gas emissions (Parliament of Australia 2010). This was followed by the Australian Government’s White Paper, which incorporated findings from the Garnaut review and public feedback. Two versions were rejected by the Australian Senate and a later version lapsed due to the calling of
the 2010 Australian general election (Parliament of Australia 2010). The influence the 2008 GFC had on Australia’s national approach to ES issues is recognised, even though Australia did not experience a recession.

In 2011, the Australian Government, under a new Prime Minister, announced the ‘Clean Energy Future’ plan including a carbon price and Land Sector Package, the Clean Energy Act and the Carbon Credits (Carbon Farming Initiative) (CFI Act) (Department of the Environment 2011). This new scheme replaced the proposed CPRS. These Acts, including the introduction of the carbon pricing scheme (i.e. a carbon tax), came into effect in 2012. The Land Sector Package includes the Carbon Farming Futures (CFF) and Regional Natural Resource Management (NRM) Planning for Climate Change Fund (Department of the Environment 2011).

The CFF planned to provide A$429 million over six years to help farmers and land managers benefit from carbon farming and provided access to direct support to demonstrate new and innovative practices that could reduce emissions and store carbon. The Carbon Farming Initiative allowed farmers and land managers to earn carbon credits by storing carbon or reducing greenhouse gas emissions on the land; these credits could then be sold to other entities wishing to offset their emissions (Department of the Environment 2012).

However, after national elections in 2013, the newly elected Australian Government attempted to repeal the carbon tax. In April 2014, the new Australian Government released a White paper on the Direct Action climate change plan, which included a A$2.5 billion emissions reduction fund (ERF) to pay industries for activities that reduce carbon emissions (ABC News 2014). In July 2014, the ‘carbon tax’ was repealed. Thus, while there has been a proactive approach by the Australian Government to address ES issues, there are policy differences in the approach taken to address these issues.

In addition to legislation, the Australian Government has also been involved in joint government/industry projects and funding to improve ES, such as the Decade of Landcare programme (1989) and Land Sector Package (2011). Other joint government/industry projects include the National Packaging Covenant, introduced in 1999 and relaunched as the Australian Packaging Covenant (APC) in 2010. The
Australian Packaging Covenant “is a sustainable packaging initiative which aims to change the culture of business to design more sustainable packaging, increase recycling rates and reduce packaging litter. It is an agreement between government, industry and community groups to find and fund solutions to address packaging sustainability issues” (APC 2014, p. 1).

5.2.6.2 Events at the WA state level (column D)

While taking account of the influence of the events occurring at the international and Australian levels (columns B and C), column D shows relevant events occurring at the WA state level. The states and territories of Australia have been proactive in ES issues, such as in 1992 when all Australian state and territory governments agreed to the Intergovernmental Agreement on the Environment, which provides for a cooperative national approach to the environment (DEC 2003). WA has been proactive in embracing international and national calls for a ‘sustainability’ focus, particularly in the early 2000s. In 2002, WA joined the UN’s ‘Network of Regional Government for Sustainable Development’ and signed the Gauteng Declaration (DEC 2003). WA was the first state in Australia to develop a state level Sustainability Strategy document (DEC 2003). The strategy stressed partnerships between government, business and the community as central to the process of sustainability.

While the EPBC Act (1999) deals with matters of national environmental significance, the states and territories have responsibility for matters of state and local significance. The central WA State environmental legislation is the Environmental Protection Act of 1986, with its many regulations. The Act provides for the prevention, control and abatement of pollution and environmental harm, for the conservation, preservation, protection as well as enhancement and management of the environment.

5.2.6.3 Pork industry (columns D and E)

As shown in Column D and E in Table 21, the current legislation in the WA pork industry is the culmination of a relatively long history (since 1911) of environmental and public health legislation. As mentioned earlier, many interviewees noted the influence of the British pork industry on the Australian and WA pork industries and
suggested trends in the practices in the Australian pork industry tend to lag five to ten years behind the British pork industry (e.g. Res5 2012; Res17 2012; Res21 2012).

Legislation in WA has run parallel to the Eastern States of Australia (Res21 2012). Res21 cast a humorous light on this long history of regulation by noting: “the pork industry has been regulated since Moses’ day. He put the first public health constraints on pork” (Res21 2012). As shown in column E, an early significant piece of legislation in WA with relevance to the pork industry was the 1911 WA Health Act that prescribes “what you can and can't do in terms of running a piggery and it grants local government the right to regulate piggeries in their respective areas” (Res21 2012). One of the purposes of the Health Act is to protect the public from “public-health nuisances, which are usually odour - that is number one, noise because of the squealing of pigs, flies and rodents and impact on visual amenity” (Res21 2012). Importantly, the 1911 Health Act classified the pig industry (together with intensive chicken farming, cattle feedlots, fowl mongering and tanning) as an ‘offensive trade’, which meant a licence and DER inspections are required (Res21 2012).

As shown in Table 21, up to the late 1960s, pig farming was a sideline enterprise in WA, with most wheat, sheep and dairy farms keeping a few pigs (Res21 2012). Pork meat consumption has historically been secondary to beef and lamb and, more recently, to the fast growing chicken industry (Res21 2012). In the late 1960s, the first larger scale, intensive piggery emerged, in which animals were fully housed and professionally managed with inputs from nutritionists and veterinarians (Res21 2012).

The transition from a sideline enterprise to more intensive enterprise “started to attract the attention of the environmental regulators, the Departments of the Environment, and various other bodies, and also they were not just aimed at the pig industry but all intensive livestock generally” (Res21 2012). Res21 explained the reason intensive livestock attracted environmental regulators’ attention was that, when livestock is concentrated in one space, it creates significant effluent in terms of nitrogen, phosphorus and potassium, which has to be managed to protect the environment and the public. Res21 noted: “Once you get to perhaps 30,000 grown or 50,000 SPU’s [standard pig units] - that is the size of a large country town in
terms of waste management” (Res21 2012); illustrating the significant waste management requirements of large piggeries.

In the late 1960s there was increasing regulation Australia-wide. Res21 noted the increased regulation “was completely independent of any supermarket pressure or whatever, it was just straight out response to protecting the, for the most part, the amenity value, which is the odour, dust, noise, flies, vermin, but also groundwater, and also surface water” (Res21 2012). Thus, the regulation of piggeries was driven by community health and amenity interests and protection of environmental resources.

The pork industry has been proactive at a national and WA level in addressing environmental and animal welfare issues specific to its industry. The WA government, in consultation with the WA pork industry, has developed guidelines for the pork industry and, in 1989, developed the ‘WA Environmental Management Guidelines For Animal Based Industries – Piggeries’ (Res21 2012), which was superseded in 2000 by ‘Environmental Guidelines for New and Existing Piggeries’ (Latto, Noonan & Taylor 2000).

The national pig industry body, APL, tried to develop a consistent national environmental guideline for piggeries so they “got together all the regulators, the departmental staff, myself [Res21] and private consultants and so on, and said ‘look we need a national guideline’ ” (Res21 2012). APL worked with industry, the community and government to develop ‘National Environmental Guidelines for Piggeries’, which was released in 2004 and provided a general framework for managing the environmental issues associated with piggeries that was revised in 2010 (APL 2010). Res21 again highlighted: “so all this is long before Coles and Woollies even thought about green products, this is just straight out environmental protection and management” (Res21 2012). In the mid-2000’s, the WA pork industry participated in the WA ‘Farming For the Future’ project to get piggeries to follow practices that lead to green accreditation. Thus, the pork industry has been proactive at state and national levels in developing industry-specific guidelines to assist the industry comply with relevant legislation.
The Australian Government’s Clean Energy Future plan (2011) was expected to significantly increase input costs for the pig industry, even though the agriculture sector was exempt from carbon pricing (IBISWorld 2012a). There have been national pork environmental success stories where piggeries have used Australian Government funding to employ ES practices, such as Blantyre Farms (piggery), which returned electricity to the grid and obtained carbon credits from the Australian Government’s Carbon Farming Initiative (The Sydney Morning Herald 2012b).

In recent times, there has been increasing environmental reporting requirements affecting the WA pork industry. Piggeries emit greenhouse gases and may need to report gaseous emissions to the National Greenhouse and Energy Reporting (NGER) scheme and the National Pollutant Inventory (NPI) (APL 2010) if they are large enough. Such a need to report may mean a company will employ environmental consultants and adopt additional ES practices to comply with reporting requirements. For example, OrgA, a large WA piggery, has to report under the NGER scheme and has employed an environmental specialist company (OrgK) to assist in setting up required reporting systems. In addition to legislation and reporting requirements and other events discussed above, the WA and Australian Government have engaged in joint government/industry programmes to try to spread ES practices which have relevance to the WA pork industry.

5.2.6.4 Joint government/industry programmes

WA state government organisations have developed programmes and plans to assist the agrifood sector, such as DAFWA’s ‘Food Industry Development 2009-2012’ plan and 2012 Agrifood 2025+ plan (DAFWA 2012a). WA government has also engaged in joint projects relating to ES, such as the Farming for the Future (FFF) project. This project is relevant to the discussion of spread of ES practices, as it was carried out in the WA pork and dairy industries (Case A1 and B, respectively), among others.

5.2.6.5 The Farming for the Future (FFF) project

The FFF project was initiated by the WA Minister of Agriculture in 2005 and run by DAFWA from 2005 to 2008, in cooperation with industry representative organisations (England & White 2009). Its objective was to ensure “Western
Australia’s food and fibre industries have the information and processes required to ensure that they can meet the growing demand to demonstrate that the food and fibre they produce is clean and safe, and is not degrading the environment” (England & White 2009, p. 207). At the time the WA State Government was responding to increasing demand from international markets and local consumers for sustainably produced products (DAFWA 2006d).

As shown in Table 21 (column D), FFF started in WA at a time when sustainability issues were receiving much attention at international, national and WA state levels. At the inception of FFF, many industries had initiated projects to develop environmental assurance programs with funding from the Australian Government’s ‘EMS [Environmental Management Systems] Pathways To Sustainable Agriculture programme’ (England & White 2009). The FFF project aimed to assist industry representative organisations develop and deliver food safety, environmental and animal welfare assurance processes, rather than implement new systems (England & White 2009).

In the FFF project, DAFWA worked with industry representative organisations from eight key agricultural and horticultural industries (dairy, grains, sheep, beef, pastoral, horticulture, poultry and pig industries) to establish a set of ‘current recommended practices’ (CRPs) for sustainable agriculture for each industry (England & White 2009). These CRPs were the key outputs from the FFF project and were published for each industry in the ‘Farming For The Future Industry Practice Baselines’ document (England et al. 2009). In each baseline, management practices were categorised under five main headings namely ‘Business planning’, ‘Economic sustainability’, ‘Social sustainability’, ‘Natural resource and production sustainability’ and ‘Biosecurity’ (England et al. 2009). Animal welfare issues were categorised under ‘Biosecurity’ and not as ‘Social’ or ‘Natural resource and production sustainability’. The baselines document is comprehensive and discusses baseline practices at a generic level, as well as for each of the eight industries in the project (England et al. 2009). The FFF baseline practices were developed for the pig industry through a desktop assessment using the APL and DAFWA environmental guidelines which had already been developed (England et al. 2009). The DAFWA
Pork Innovation Group and WAPPA worked with APL to develop and deploy codes of practice (England et al. 2009).

The FFF project seemed to have many of the ingredients for success, such as cooperation between DAFWA and industry representative organisations, DAFWA’s facilitation of networking and sharing of ideas between the WA industries, as well as appropriate funding. Another factor suggesting the FFF would be successful in spreading ES practices was the international, national and WA interest in sustainability issues at the time of inception, as shown in Table 21.

However, the interviews suggested the FFF did not achieve all of its EMS practices goals (Res1 2012; Res6 2013; Res2 2012; Res19 2012). A key finding of the FFF project was that “the adoption of on-farm assurance processes is generally not favoured by farmers” (England & White 2009, p. 207), suggesting a significant group of actors (farmers) did not fully engage in the initiative. With the benefit of hindsight, interviewees involved with the project offered explanations as to why it had limited success in spreading ES practices.

**Factors contributing to a lack of success of the FFF project**

The first factor was that the market demand for certified ES credentials never materialised (Res1 2012; Res2 2012; Res19 2012; Res6 2013). Res1 from DAFWA explained “there wasn’t really strong market pressures particularly around environmental” and that credence attributes (such as ES credentials) “wax and wane in relation to what is happening in the world.” Res1 cited the example that, after the poison milk crisis in China, the consumer focus was on food safety and consumers “didn’t care whether you were dumping nutrients into a river or anything like that” (Res1 2012). Res1 believes end consumers determine the spread of ES practices since, “if you [i.e. a farmer or a company] don’t have to do it [ES practices] you don’t do it” (Res1 2012). Res1 commented that DAFWA’s “feeling was at the end of it that this [FFF] is all a bit too early” since the FFF took place before market demand for certification emerged. A factor contributing to the lack of Australian demand for ES accreditation is the high overall ‘clean and green’ standards already in place. This is illustrated in the following comment by Res6: “people don't get sick from chemical applications … because our farmers are educated and they know how to use them … whereas if you go into other countries, they are not educated, they
don't know how to use them, people do get sick,… so we don't have that pressure on us, not right in our face, like it is in some other countries” (Res6 2013).

A second factor leading to lack of spread of ES practices in the FFF project was the cost of the ES practices in a climate in which many farmers were struggling to remain economically viable. Res19 noted a farmer said: “it is hard to be ‘green’ when you are in the ‘red’ ” (Res19 2012). Res1 explained that farmers would say to FFF project officials: “show us an increase in profit else we won’t do it” (Res1 2012).

Another factor hindering spread in the FFF project was the vague nature of the ‘environmental’ claim: “it’s a more disaggregated kind of claim. You have ‘environmental’ ‘a bit’ to ‘a lot’ ” (Res2 2012). Res2 commented “that’s where FFF fell down because it couldn’t get that aggregation of effort, that marketing effort, that chain effort …[…] it doesn’t lend itself to that collective marketing as much as the ‘local’ [claim] does” (Res2 2012). Res2 was referring to a successful WA marketing campaign of ‘local’ food, namely the ‘Buy West Eat Best’ campaign. Res3 from DAFWA explained “farmers had to do this extra work to be part of the [FFF] scheme but there was no market advantage, so no commercial advantage which came from it” (Res3 2012).

The interviews suggested another factor hindering spread was mixed support within DAFWA (Res1 2012; Res6 2013). One group within DAFWA was focused on the ‘triple bottom line’ (which includes economic sustainability), while another group was focused only on environmental sustainability (Res1 2012). At the time, some DAFWA members felt FFF baselines were a waste of money (Res1 2012).

A further factor contributing to a lack of success was that “farmers hated it … because they don’t like government telling them what practices they can do” (Res1 2012). Res1 added that DAFWA found “because we tried to push this stuff up … we were told, often at times almost physically, to go away” (Res1 2012). Also, farmers “didn’t want to fill out all the paperwork” (Res1 2012). Another factor deterring spread was that most WA agricultural products are commodities (e.g. wheat), which means they are hard to differentiate on ES accreditation criteria (Res6 2013; Res11 2012; Res1 2012). Also, while consumers demand high ES standards from Australian
producers, they are not willing to pay a premium for it (Res2 2012; Res3 2012). A further hindering factor was that farmers are disengaged from the accreditation process, as they are far removed from the end market (Res6 2013).

The lack of spread was also due to farm consultants not focusing on ES accreditation (Res1 2012). This was crucial as farm consultants influence farmers’ decisions (Res1 2012; Res19 2012; Res30 2013; Res6 2013). Res1 suggested most WA farmers have two to three consultants and often government departments communicate with farmers indirectly through their farm consultants (Res1 2012). Res19 noted the focus of most farm consultants is yield optimisation, as economic viability is a concern for many farmers. Farmers are focused on “short-term viability … [which] causes them to compromise their medium- to long-term sustainability” (Res19 2012). The FFF project’s relative failure was also affected by Australian supermarkets not demanding environmental accreditation (Res19 2012), which reduced its value.

A further factor contributing to the lack of success of the FFF project was the change in direction of Australian Government funding towards the end of the FFF project. Australian Government funding for EMS practices (such as those in the FFF project) ceased and were now directed to carbon emission abatement practices (Res6 2013). Res6 explained the impact of the withdrawal of Australian Government financial support: “that removal of funds was when we saw everything fizzle out” in the FFF project. When the Australian Government funding changed focus, the Australian Government told industry that they need to fund EMS and the FFF project themselves, which resulted in each of the industries funding projects to varying degrees (Res6 2013). Res6 commented that “government policy really does direct where industry funds go” (Res6 2013). The GFC, which started in 2008 shortly before the project ended, also influenced government funding and farmer profitability, reducing the FFF’s effectiveness.

Some interviews (Res2 2012; Res19 2012; Res1 2012) and scrutiny of the current WA Agri 25+ plan suggest the WA State Government, while mindful about ES issues, did not actively pursue EMS and ES accreditation in the 2010s. The State Government believed work in this area had been done (in the FFF project) and, if the demand should arise in the future, the FFF project could be reactivated (Res1 2012; Res6 2013; Res19 2012). The amount of spread of the ES practices and the success
of the FFF project differed between industries that had various pressures and circumstances. Although the FFF project may not have been a success, the current study suggested it did contribute to the spread of ES practices, when considered in combination with other processes of spread (see section 5.2.9).

**Synopsis of FFF project**

The FFF project provides an interesting illustration of the factors contributing to a lack of spread of ES practices. The project had good ingredients for success, including a supportive international and national environment. However, the factors contributing to the lack of spread reinforced each other and, in the end, the project did not spread EMS practices as planned.

**5.2.7 Processes of spread of ES practices in the WA pork industry**

The processes of spread of ES practices in the WA pork industry are summarised in Table 22. Column B in Table 22 shows the 12 macro-processes identified using the abductive approach. The macro-processes include multiple sub-processes, each of which had further sub-processes. Examples of the sub-processes are shown in column C. The events from Table 21 and other sources of evidence relevant to the processes are shown in column D. Column E provides examples of relevant quotes from interviews and other evidence relevant to these processes.

Some spread processes relate to only some types of organisations, while other processes relate to many types of organisations. Hence column F in Table 22 is divided into separate columns for farmers, processors and retailers. This allows for an indication of the degree to which the organisation type was affected by the process, where ‘H’ indicates high prevalence, ‘M’ indicates medium and ‘L’ indicates low prevalence of the process in relation to the organisation type. This categorisation of prevalence was based on triangulation between interviewees’ perspectives and documents, as well as a double sense-making process.
### Table 22: Processes of spread of ES practices in the WA pork industry

(H=high, M=medium and L=low. F=farmers, P=processors and R=retailers)

<table>
<thead>
<tr>
<th>Macro-processes of spread</th>
<th>Examples of sub-processes of spread</th>
<th>Relevant events from Table 21 and other evidence</th>
<th>Examples of relevant quotes from interviews / other evidence</th>
<th>Prevalence for farmers, processors and retailers</th>
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<tbody>
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<td>(A)</td>
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<td>(D)</td>
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| S1                        | Enacting and enforcing environmental (and other relevant) legislation, regulations and reporting requirements | 1) Enacting and enforcement of the WA Health Act of 1911.  
3) Enacting and enforcement of the WA Environmental Protection Act of 1986.  
4) The DER issuing and enforcing the licences required for the piggery, abattoir and rendering plant of OrgA.  
5) The development and enforcement of the National Greenhouse and Energy Reporting Act (NGER Act).  
6) OrgA implementing the NGER requirements, which included consulting a green specialist company. | D1.1, E1.1, E1.2, E3.1, D5.1, C11.1, C14.1, C15.1, C22.1, C23.1, C24.2, C25.1, C26.4, C27.1, C27.2, C27.3, C27.4, C28.1, C28.2, C28.3, C28.4, C29.1, C30.1, C30.2, C30.3, interviews, supermarket review | Res5 of DAFWA describes this macro-process as the “culmination of clean/green procedures and practices over a long history which has given Australia the clean/green image it enjoys today.”  
Res27 of OrgA: government “are a necessary evil - you need to have regulations.”  
Res27 of OrgA said of NGER scheme: “we probably spent nearly 30 or 40 000 dollars on getting external advice but it’s quite a serious legislative commitment that you have got to make and the CEO will go to jail if you don’t tell the truth. And it is auditable.” | H H H |
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<th>Macro-processes of spread</th>
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3) Development of the National environmental guidelines for Piggeries in 2004.  
5) National Packaging Covenant (1999) then later the Australian Packaging Covenant (2010).  
2) Res22 of DAFWA: the DER “don't know a lot about the pork industry. They often have a very high turnover of staff …[]… so we have started that fairly recently - running training workshops for them just to explain to them this is the reason we do things this way and it's not that we are trying to break the rules but to do it the other way is just too expensive”. | H | H | H |
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<th>Macro-processes of spread</th>
<th>Examples of sub-processes of spread</th>
<th>Relevant events from Table 21 and other evidence</th>
<th>Examples of relevant quotes from interviews / other evidence</th>
<th>Prevalence for farmers, processors and retailers</th>
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</table>
2) Development and implementation of Kyoto Protocol agreement in Australia.  
3) Development and implementation of Australian Packaging Covenant of 2010.  
5) Coles and Woolworths producing comprehensive sustainability reports.  
6) Coles and Woolworths being assured and rated according to GRI 3 series. | B6.3, E7.1, B10.1, C10.1, B12.1, C12.1, B13.1, B13.2, C15.2, E16.1, C17.1, B18.3, C18.1, D18.1, D19.1, C26.1, C26.2, B27.1, B29.2, B31.1, interviews, supermarket review | 1) Res 28 of OrgC: “brand owners such as ourselves have really got, once you get to a certain size, have got two choices …[].… You can become a voluntary signatory to the Australian Packaging Covenant or you can comply with government legislation. And from our understanding the complying with the government legislation is a lot more onerous.”  
2) Wesfarmers (Coles) SR assurance report: “Wesfarmers would now be considered an organisation with substantial expertise in preparing public Sustainability Reports. The organisation produces a good quality Report that addresses its environmental, social and broader economic issues” (Wesfarmers Ltd 2008, p. 131). | H | H | H |
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<th>Macro-processes of spread</th>
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<th>Examples of relevant quotes from interviews / other evidence</th>
<th>Prevalence for farmers, processors and retailers</th>
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| S4 Spread through consumers demanding ES practices | 1) Australian consumers expecting a high ‘clean and green’ standard from Australian companies.  
2) Consumers in wealthier countries expecting higher ES standards than in lower income countries (Res11 2012).  
3) Consumers contacting OrgD and enquiring about their ES practices (Res24 2012).  
4) Spread through Coles and Woolworths educating consumers about ES issues such as the use of plastic shopping bags.  
5) The education of consumers through government programmes such as the Australian Landcare programme.  
6) Education of consumers by environmental organisations such as the WWF. | C8.1, B21.1, interviews, supermarket review | 1) Res5 of DAFWA: Australian consumers “inherently expect product to be produced in an eco-friendly and ethical way.”  
2) Res 24 of OrgD: “the consumer is becoming very informed … […] very informed about what they’re eating … […] they want to understand the welfare and the environmental impacts. So that’s probably one of our driving factors.”  
3) Res1 of DAFWA: “really at the end of the day it’s the last buyer in the chain that determines these things [ES practices] because if you don’t have to do it you don’t do it.” | L | L | M |
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<th>Macro-processes of spread</th>
<th>Examples of sub-processes of spread</th>
<th>Relevant events from Table 21 and other evidence</th>
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<th>Prevalence for farmers, processors and retailers</th>
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| **S5** Spread through (international) movement of staff | 1) Tesco directors moving to Coles and bringing ES experience from the UK.  
2) Staff moving to other companies and recommending the use of recycling company OrgI.  
3) OrgA hiring farm managers from European countries with much experience with pigs (Res27).  
4) OrgD hiring staff from the UK bringing ES and pork experience to the WA pork industry (Res24). | Interviews | 1) Res22 of DAFWA: Coles “are quite open about having brought in some of their executives from Tesco's, so they are UK-based. So they are implementing what they implemented in the UK.”  
2) Res27 of OrgA: “our farm manager …[]… has come from Peru - he has got a fantastic history in pig farming and those operations, our other farm operators have all come from the UK or other parts of the world where there has been a greater or bigger [pig] industry.” | M M M |
| **S6** Spread through actors wanting to ‘do the right thing’ | 1) UN implementing a focus on the ‘Era of sustainability’.  
2) Australia implementing the ‘Decade of Landcare’ programme in 1989.  
3) OrgA implementing ES practices because the shareholders want to ‘do the right thing.’  
4) Companies utilising recycling by OrgI to ‘do the right thing.’ | B6.2, C8.1, B9.2, Interviews | 1) Res27 of OrgA: “we do a lot [of ES practices] just for our shareholders …[]… they want to know that we are doing you know the right thing.”  
2) Res27: “every one of those 500 employees [at OrgA] wants to know that the company is doing the right thing for everything - paying them for sure - but also environmentally and so forth.” | L L L |
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<th>Macro-processes of spread</th>
<th>Examples of sub-processes of spread</th>
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<tr>
<td>S7 Green supply chain management</td>
<td>1) Coles and Woolworths assisting suppliers in foreign countries to adhere to Ethical sourcing policies and green purchasing criteria. 2) OrgG encouraging suppliers to implement further ES practices, as part of OrgG’s ISO 14001 requirements. 3) Coles and Woolworths enquiring of OrgC (smallgoods manufacturer) about their ES practices.</td>
<td>Interviews, supermarket review</td>
<td>1) Res16 of OrgH: “it’s part of our supplier agreements and our assessment of suppliers […] suppliers are asked to provide us with information that will support their environmental and sustainability initiatives and procedures that they have.” 2) Res28 of OrgC: “people like Woolworths and Coles who have green initiatives ask us [OrgC] to tell them what initiatives we have. So they want us to support them in their effort to come across to the customers as ‘green’.” 3) Res28: “I don’t think there’s a huge pressure [from Coles and Woolworths] that says that if you don’t do this then you will no longer supply us. You have to demonstrate that you are doing some [ES] things.” 4) Woolworths SR: “67.6% of factories making our own brand products were audited on Ethical Sourcing criteria” (Woolworths Ltd 2012).</td>
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<td>Macro-processes of spread</td>
<td>Examples of sub-processes of spread</td>
<td>Relevant events from Table 21 and other evidence</td>
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<td>1) Spread by assurance companies making recommendations to e.g. Coles and Woolworths. 2) Spread by farm consultants advising farmers to take part in government ES projects or to implement additional ES practices. 3) Spread by green specialist companies (such as recycling company OrgI) approaching prospective clients and encouraging them to recycle.</td>
<td>Interviews, supermarket review</td>
<td>5) Coles (Wesfarmers) SR: “In line with our approach of ensuring suppliers of Coles brand products comply with our ethical sourcing policy, over the past year we audited 85 suppliers out of 316 operating in non-Organisation for Economic Co-operation and Development member countries” (Wesfarmers Ltd 2011, p. 32).</td>
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**S8**

**Spread through intermediaries**

1) Spread by assurance companies making recommendations to e.g. Coles and Woolworths.
2) Spread by farm consultants advising farmers to take part in government ES projects or to implement additional ES practices.
3) Spread by green specialist companies (such as recycling company OrgI) approaching prospective clients and encouraging them to recycle.

1) Res18 of OrgI: “we drive people to recycle. We’re the driver, we’re the germ in there.”
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</table>
| **S9**                   | Spread by organisations choosing to pursue green marketing |                                           | 1) Res2 of DAFWA: “the claim of ‘environmental’ is a deeper claim and it’s a more disaggregated kind of claim. You have ‘environmental’ ‘a bit’ to ‘a lot’, whereas ‘local’ is local and it’s a distinguishing factor which can be collectivised a lot easier. So a collective marketing effort for a local ‘Buy West Eat Best’ branding programme is a lot easier to do … it gives direct benefits than the environmental one.”
2) Res27 of OrgA commented that “I think when we pick up these [sustainability] awards it’s amazing how much the employees sort of get a buzz out of that as well”, suggesting that sustainability awards are good for their business.
3) Woolworths win the sustainable retailing category in the 2012 BRW Australian Retailer of the Year Awards and the “2013 Global leader in the Dow Jones sustainability indices for food and staples retailing industry” (Woolworths Ltd 2013a). | L | L | H |
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<th>Macro-processes of spread</th>
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| S10 | Spread due to international influence and global committees | 1) Spread of high ES standards in e.g. the UK pork industry to the WA pork industry through imitation.  
2) Spread through global interest in the environment (such as UN conferences on the environment) which influences Australia to take part in global initiatives concerning ES issues such as climate change.  
3) Spread though international voluntary agreements such as Kyoto protocol (relates to process S3) which Australia chooses to participate in.  
4) Spread through international projects to develop environmental standards such as GRI and ISO 14001. | B4.1, B6.1, B6.2, B6.3, B9.1, B9.2, B10.1, C10.1, B12.1, B13.1, B13.2, B18.1, D18.1, B18.2, B18.3, B21.1, B24.1, B25.1, B25.2, B26.1, B27.1, B28.1, B29.1, B30.1, B30.2, B31.1 | 1) Woolworths: by having a “close association with global organisations such as The Consumer Goods Forum and The United Nations Global Compact Network, we are at the forefront of debate and central to the positive change taking place in critical areas such as ethical sourcing. Working collaboratively with the world’s best retail organisations, Woolworths is actively ensuring that Australia’s and New Zealand’s interests are represented and paving the way for other retailers to follow and adopt more sustainable working practices” (Woolworths Ltd 2012, p. 6).  
2) Res17: “Western Australia specifically is about 5 to 6 to 7 years behind the UK.” | H H H |
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| S11 Spread through pursuit of economic sustainability | 1) Farmers implementing ES practices because they are sound business practices i.e. increase productivity or reduce costs.  
2) OrgA implementing a new low heat system at its rendering plant, utilising an Australian Government grant.  
3) Food processors reducing packaging since it saves costs.  
4) Coles and Woolworths implementing intra-organisation practices which reduce costs, such as more efficient refrigeration systems. | B24.1, B25.1, C28.5, interviews, supermarket review | 1) Res28: “So we want to be ‘green’[…]…but you know really a lot of this stuff is driven by sheer dollars.”  
2) Res28: “most of the march towards being a ‘greener’ company is driven by economics rather than actually wanting to be green.”  
3) Res1 of DAFWA: “we have got to the stage now where the only reason that the rest of the farmers will adopt is if there is a dollar economic advantage.”  
4) Woolworths SR: “But more than anything, sustainable behaviour just makes good business sense” (Woolworths Limited 2007, p. 2) and “Business decisions are now more frequently assessed on the basis of both fiscal and sustainability outcomes” (Woolworths Limited 2010, p.3). | H H H |
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<td>S12</td>
<td>Imitating</td>
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1) Coles and Woolworths imitating ES practices to avoid giving the other company a “point of difference.”
2) OrgC imitating ideas from international trade fairs.
3) Woolworths positioning itself as a global leader in sustainability performance and reporting, which other companies imitate.
4) Blantyre Farms (piggery) being the first farm to obtain carbon credits from the Australian Government’s carbon farming initiative by returning electricity to the grid through the use of biogas. Other companies can imitate this demonstration of ES practices.

Interviews, supermarket review

1) Coles and Woolworths SR issues lag the UK comparative companies, suggesting that they imitate certain practices.
2) NetBalance (the independent assurance company that audits both Australian retailers in terms of GRI) states that: “Woolworths continues to demonstrate leadership in the retail sector globally in regards its corporate responsibility disclosure and performance” (Woolworths Ltd 2011, p. 53).
3) Woolworths 2007 strategy document: “We aim to move to a leadership position on sustainability” (Woolworths Limited 2007, p. 3).
4) Woolworths 2009 SR: “Woolworths Limited’s long-term goal is to be recognised as the leader in sustainable retailing in the Australian retailing sector” (Woolworths Ltd 2009, p. 1).
The following sections discuss the processes of spread in Table 22 in more detail. First the 12 macro-processes of spread identified in relation to the spread of ES in the WA pork industry are discussed. The composition of the processes, the interactions between the processes and the multiple levels at which the processes occur are then analysed further.

5.2.7.1 Enacting and enforcing environmental (and other relevant) legislation, regulations and reporting requirements

This process refers to the spread of ES practices through the slow and steady momentum achieved by a long history of enforcing environmental and health legislation, regulations and reporting requirements. The WA pork industry is affected by national and WA legislations and reporting requirements, as shown in columns C and D of Table 21. The DER are responsible for enforcing environmental legislation in WA (Res7 2013) and plays an important role in this process. For example, OrgA’s abattoir, piggeries and rendering plant need licences to operate which are managed by the DER.

DAFWA also play a role in this process by being a bridge between the piggeries (particularly the smaller ones) and DER to assist in explaining to piggeries the reasons for DER requirements and to explain to DER the site and industry-specific issues that need to be taken into account (Res21 2012; Res22 2012). Pork industry-specific regulations and guidelines that help industry participants in adhering to the legislation have also been developed (Res21 2012).

As shown in Table 21, the number of statutory reporting requirements has increased over time. These reporting requirements (e.g. NGER scheme) lead industries and companies to implement additional ES practices to gather the required information for reporting. For example, OrgA has to report under the NGER scheme because they meet its energy consumption threshold. OrgA uses environmental specialist company OrgK to assist with this.

Res21 from the DAFWA Pig Innovation Group emphasised that process S1 is driven by environmental and health management, and not by the supermarkets or green marketing. Interviewees who had farming, processing and retail operations all
indicated the prevalence of this process, hence the assignment of ‘high’ prevalence in column F in Table 22 for all three organisation types.

5.2.7.2 Forming and implementing joint government/industry projects

This process refers to the spread of ES practices through the development of joint government/industry projects. There were examples of such projects involving various combinations of industry representative organisations, individual companies, local governments, state government departments and Australian Government departments. In the joint projects, government typically provided a significant proportion of the financial resources. Res6 explains that state and industry representative organisation level projects are often implemented to capitalise on Australian Government funding. In this way, the Australian Government can direct the focus of industry projects and the types of practices that are spread. This was seen in the FFF project, in which the Australian Government focus was first on environmental management systems (at the start of the project) and then, later, on carbon emission abatement (Res6 2013). Interviewees from farming, processing and retail operations all indicated the prevalence of this process, hence the assignment of ‘high’ in column F.

5.2.7.3 Developing and implementing voluntary agreements and reporting requirements

This process refers to the spread of ES practices when countries, states and organisations enter into voluntary agreements. For example, at an international level, the Kyoto Protocol agreement, of which Australia is a signatory, has spread ES practices, as the Australian Government implemented actions to meet their voluntary commitments. At an organisational level, the decision to issue voluntary sustainability reports is a process that can result in ES practices being undertaken to gather required information for reporting.

Res19, an industry specialist, suggests ISO 14001 accreditation is rare in the WA agrifood sector. Yet interviews suggested large and multinational companies have pressure from corporate clients to demonstrate their ES credentials (Res16 2012; Res15 2012), which has led them to attain formal accreditation. For example, OrgG and OrgH, which are large food distribution companies, are ISO 14001 certified.
Interviews and the supermarket review show the influential role the Australian Packaging Covenant (APC) initiative played in bringing about voluntary ES changes, particularly in processors (e.g. OrgC) and retailers/supermarkets. Brand owners with a turnover larger the A$5 million have to either become a voluntary signatory to the APC or comply with the National Environmental Protection Measure (Used Packaging Materials) 2011 (APC 2014). Res28 from OrgC believed reporting under the voluntary APC was the less onerous choice and the “least worst scenario” and “makes good business sense anyway.” Thus, the avoidance of more onerous reporting legislation led OrgC to report under the voluntary APC, improving ES packaging practices. Interviewees from farming, processing and retail operations indicated the prevalence of this process; hence the assignment of ‘high’ prevalence in column F.

5.2.7.4 Spread through consumers demanding ES practices

Such processes include the education of end consumers by retailers (e.g. Coles and Woolworths about plastic shopping bags), the Australian Government (e.g. the Landcare programme) and environmental advocacy groups. Interviewees suggested Australian consumers believed and expected Australian organisations to use ‘clean and green’ practices, which places Australian organisations, particularly those in close proximity to end consumers, under consumer scrutiny (Res21 2012; Res5 2012; Res7 2013). Interviewees argued most Australian consumers are not willing to pay more for environmentally friendly products (Res1 2012; Res22 2012; Res3 2012), although Res24 from OrgD noted niche high-end consumers are willing to pay a premium for such products. Hence this process was allocated a ‘low’ prevalence for farmers and processors. The retailers received a ‘medium’ prevalence as they are closer to consumers and the supermarket reports indicated some consumer ES pressure.

5.2.7.5 Spread through (international) movement of staff

This process occurs when ES practices are spread as staff move from one organisation to another, such as when Res28 moved from one company (with experience in APC reporting) to OrgC, bringing with him his ES experience. Another example cited by Res18 of OrgI is when an employee moved between companies and
recommended using OrgI for recycling. Res24 of OrgD commented that many experienced workers from the UK pork industry had moved to Australia, bringing their expertise with them, an example of international spread through this process. Res27 of OrgA also spoke of the international movement of management in OrgA, bringing international expertise with them. A further example of this process cited by Res24 and Res21 was the movement of directors from Tesco in the UK to Coles in Australia, bringing their experience with ES issues. The data suggests that farmers, retailers and supermarkets are affected by this process at a medium level of prevalence.

5.2.7.6 Spread through actors wanting to ‘do the right thing’

This process occurs when ES practices are implemented by organisations wanting to ‘do the right thing’. Res27 of OrgA highlighted the influence of staff and shareholders wanting to ‘do the right thing’ on OrgA’s ES practices. Res18 of recycling company, OrgI, also mentioned that managers wanted to ‘do the right thing’ which had led to the success of his recycling business. Other interviewees did not mention this process and indicated that organisations would not practice ES if they did not have to (Res1 2012); hence prevalence is indicated as ‘low’.

5.2.7.7 Green supply chain management

This process occurs when organisations assist and/or coerce suppliers to increase ES performance and take a supply chain perspective rather than a single organisation perspective on ES issues. As indicated in the supermarket review, Australian supermarkets practice green SCM, but mostly with respect to their house-brands sourced from countries with less stringent ES legislation than Australia. The supermarket review and interviews suggested supermarkets did not demand ES accreditation (Res19 2012; Res28 2012; Res27 2012), whereas they did make other demands on suppliers such as ‘sow stall free’ pork and ‘hormone-free’ beef.

Res28 of smallgoods manufacturer OrgC indicated a low level of green SCM by Coles and Woolworths and that OrgC did not use green purchasing practices or green SCM with their own suppliers. The pig farmers interviewed had little supply chain ES pressure on them from Coles and Woolworths and did not engage in green SCM with their own suppliers. However, the interviewees made it clear that Coles and
Woolworths have significant supply chain power and can create change in the supply chain, but that they are not currently wielding this power with Australian suppliers regarding ES.

The food service and distribution companies, OrgG and OrgH, indicated that, as part of their ISO 14001 accreditation, they are required to encourage ES in their suppliers. OrgG enquire about their suppliers’ ES practices, encourage suppliers to improve ES and conduct random audits on some suppliers; but do not exert pressure on suppliers regarding ES. This suggests green SCM had a low level of prevalence for farmers and processors and a medium level of prevalence for retailers.

5.2.7.8 Spread through intermediaries

This process occurs when organisations implement ES practices as a result of interactions with influential intermediaries, such as farm consultants, assurance companies (e.g. NetBalance, which audits Coles and Woolworths sustainability reports) and other green specialist companies that approach or are approached by companies about ES issues. Interviewees highlighted the strong influence farm consultants have on farmers’ decisions and that government departments often communicate with farmers indirectly through their consultants (Res1 2012; Res6 2013; Res12 2013). Res1 from DAFWA believed one of the reasons for the lack of spread of ES accreditation processes in the FFF project was that farm consultants did not promote these practices.

Assurance companies assist in spreading best international practices to the companies they audit through the advice they provide during the audit, as well as in the ‘recommendation’ section of their independent assurance reports. The supermarket review suggested some of this advice is implemented. Included in this process are interactions with other green specialist companies. For example Res27 of OrgA approached a green specialist company (OrgK) to help them comply with legislated reporting requirements. Some green specialist companies, such as OrgI (recycler), see themselves as a ‘spreader’ of ES, as they approach companies and motivate them to use additional ES practices. Res13 of retailer OrgJ is approached daily by people trying to sell him ES products and services, illustrating this process. Similarly, food service company OrgH is continuously approached by companies
trying to sell ES processes, products and machines, especially after OrgH won sustainability awards. The data indicates a ‘medium’ prevalence of this process of spread for farmers, processors and retailers.

**5.2.7.9 Spread by organisations choosing to pursue green marketing**

This process occurs when organisations’ pursuit of green marketing leads to the implementation of additional ES practices. This process includes the pursuit of sustainability awards. Interviewees suggested this is not a common process for farmers and processors (hence the ‘low’ prevalence level indicated in Table 22), but it does occur. For example, Res28 of OrgC, a smallgoods producer, noted OrgC is continuously on the look-out for innovative ES practices to reap green marketing opportunities. Res28 explained that, when company representatives attend international food fairs, they search for novel ES ideas, to give them a ‘point of difference’, such as the novel environmentally friendly packaging OrgC launched in 2013.

Interviewees argued ‘green’ and ‘environmental’ are vague terms that are difficult to market, as demonstrated by the failure of the FFF project. A further problem is that some consumers have had negative experiences with ‘greenwashing’, which has made them sceptical about ‘green’ claims (Res3 2012). Further, it is hard to trace ‘green’ credentials through the supply chain (Res11 2012; Res6 2013).

The supermarket review showed supermarkets market their intra-organisation ES practices and achievements in their sustainability reports and websites. However, their main marketing campaigns focus on issues such as animal welfare (e.g. Coles focus on sow stall free pork and free range eggs) and consumer health (e.g. Coles hormone-free beef). Nevertheless, the comprehensive SRs suggest a ‘high’ level is appropriate for the retailers.

**5.2.7.10 Spread due to international influence and global committees**

This process refers to ES practices being implemented due to international influences, such as the activities of the UN, international best practices, international ES agreements (such as the Kyoto Protocol) and attention paid to practices in other countries. Interviewees indicated the strong influence of other countries (Res1 2012;
Res15 2012; Res28 2012), in particular Britain (Res21 2012; Res22 2012; Res24 2012; Res17 2012), on the WA pork industry, hence the ‘high’ level of prevalence indicated in column F. Issues in the WA pork industry tend to lag trends in the UK by five to 10 years (Res17 2012; Res24 2012). Res28 indicated that smallgoods producer OrgC is influenced by international food shows in Europe and site visits to food processors in Europe and North America. The SRs of Woolworths and Walmart showed they interacted at a global level on debates about sustainability, indicating they are contributing to the spread of ES practices and in turn ES practices are being spread to them through global forums.

5.2.7.11 Spread through pursuit of economic sustainability

This process refers to the implementation of ES practices because of an expected net economic benefit for the organisation (i.e. implementation occurs because it makes good business sense). ES practices may have operational efficiencies and cost savings. Res15 from OrgG (a food distribution and services company), who continuously searches for ways to improve efficiency, which can result in improved ES, mentioned “starting with the small changes first,” such as reducing paper use (e.g. moving to a paperless inventory tracking system), reducing non-renewable energy consumption (e.g. using solar power) and reducing fuel consumption (e.g. using hybrid trucks). A further example can be seen in some farming practices (e.g. conserving water and energy and preventing soil and water from being contaminated) that are used in the normal course of farming to reduce costs and increase production, but also benefit ES (Res22 2012).

Since economic sustainability is a concern for many companies, government incentives, funding and taxes can alter the costs and benefits of ES practices and encourage the adoption of ES practices. For example, in 2010 OrgA moved from a high to a low temperature system at its rendering plant, reducing gas consumption by 40%. OrgA received an Australian Government grant to do this, tipping the analysis in favour of the new ES practice. A further example of a government tax assisting ES is WA’s ‘landfill levy,’ which encourages recycling by making the alternative (landfill) more expensive.
5.2.7.12 Imitation

This process occurs when organisations imitate other organisations’ ES practices. This may occur when organisations imitate best practice and the practices of exemplar companies, who are ES leaders. Interviews and the supermarket review suggested the major Australian supermarkets pay close attention to each other’s policies and imitate each other’s policies so as to avoid allowing a ‘point of difference’; hence the ‘high’ prevalence level allocated to supermarkets. Some companies, such as processor OrgC, observe overseas comparable companies’ practices at trade fairs and through site visits, which they may imitate (Res28 2012); hence the ‘high’ prevalence indicated for processors. Interviewees related how demonstration farms can show how ES practices work. The media coverage of the Blantyre Farm biogas success story was an opportunity for farmers to imitate biogas ES practices; hence the ‘high’ prevalence for farmers.

5.2.8 Composition of processes

As shown in Table 22, the 12 macro-processes of spread identified (shown in column B) have multiple sub-processes (examples of which are shown in column C). Each of the sub-processes in column C can be further analysed through the processes and events making up these sub-processes, as illustrated in the following example.

Process S1 (Enacting and enforcing environmental (and other relevant) legislation and regulations) arose from a number of sub-processes, such as ‘Enacting Australian legislation’ (S1.1), ‘Enacting WA legislation’ (S1.2), ‘Enforcement by the DER’ (S1.3) etc. Each of these sub-processes arose from other sub-processes. For example, ‘Enacting Australian legislation’ (S1.1) arose from a number of different laws and regulations, such as S1.1.1 (The development and enforcement of the National Greenhouse and Energy Reporting (NGER) Act of 2007 (example 5 in column C of Table 22)) and S1.1.2 (Enacting and enforcement of the Australian Environment Protection and Biodiversity Conservation (EPBC) Act of 1999 (example 2 in column C)). Similarly, ‘Enacting WA legislation’ (S1.2) arose from various laws and regulations, such as S1.2.1 (Enacting and enforcement of the WA Health Act of 1911 (shown as example 1 in column C)) and S1.2.2 (Enacting and enforcement of the WA Environmental Protection Act of 1986 (example 3 in column C)). The process of
‘Enforcement by the DER’ (S1.3) is made up of multiple interactions with organisations and groups of organisations (as indicated in interviews), called processes S1.3.1 and S1.3.2. This iterative process in which processes are composed of other processes can be illustrated further. For example, a particular Australian ES legislation (S1.1.1) arose from other processes, such as international influence (S1.1.1.1), getting the bill enacted (S1.1.1.2) and so forth. The same iterative process can be shown for the 12 macro-processes identified in Table 22.

From the above illustration it is clear many of the ‘events’ in Table 21 are representative of sub-processes leading to that event, depending on the level of aggregation at which the events and processes are analysed. Column D of Table 22 shows some events (from Table 21) form parts of multiple processes. Some events reinforce and some mitigate spread. For example, the repeal of the carbon pricing scheme in July 2014 (event C30.3 in Table 21) mitigated the process of spread S1 in Table 22, yet is still a relevant event to the process.

5.2.9 Interactions between processes

Table 22 shows that the spread of ES practices in the WA pork industry is the result of multiple processes that may occur in series (in sequence over time) or in parallel (simultaneously). An important aspect of the illustrative example in section 5.2.8 and the overall process of spread of ES in the WA pork industry is that the sub-processes do not ‘add-up’ to the higher order process. Rather, the higher order process (e.g. the spread of ES in the pork industry) emerges from the multiple interacting sub-processes.

Many processes resulted in more spread when combined with other processes. For example, although ‘Enacting and enforcing environmental (and other relevant) legislation and regulations’ (S1) is a successful process, the uptake of the legislated ES practices is assisted by the joint government/industry projects focusing on development of industry-specific guidelines for the pork industry, a sub-process of S2. Some processes lay the foundation for the success of processes occurring later. For example, the FFF project, although not in itself a success, still provided information about ES practices to the WA agrifood sector, which added to the success of future processes, such as Woolworths encouraging suppliers to improve
ES practices (a sub-process of S7). Thus, the case study data showed the importance of interactions between processes as they can give rise to higher level, macro-processes of spread. This process is not additive (i.e. the sum of the multiple interacting processes does not explain the resultant macro-process). Instead, the macro-process is emergent.

The data showed bottom-up and top-down processes. For example, SCM (S7) is a top-down process, whereas ‘Spread though consumers demanding ES practices’ (S4) is a bottom-up process. The macro-processes in column B of Table 22 that emerged from multiple interacting sub-processes are bottom-up processes. However, emergent macro-processes then affect factors influencing spread, which has a feedback effect on the processes. For example, multiple, interacting processes resulted in a ‘clean and green’ image for the Australian agrifood sector. This process results in consumers expecting ES practices, strengthening process S4.

5.2.10 Multiple levels

The events and processes in Table 21 and Table 22 were observed at various levels, such as the international, national, state, industry, supply chain and dyadic levels. For example, the process of green SCM can occur at an international level if international companies with operations or suppliers in multiple countries make green SCM policy decisions that affect the spread of ES to various countries (e.g. Coles, Woolworths, Walmart and Tesco). At a national level, companies can set green SCM policies that affect the spread of ES in Australia. A similar argument applies to green SCM practised at a WA, pork industry and pork supply chain level. The interactions between OrgD and its suppliers illustrated this process at a dyadic level.

At each level, various actors were involved. The actors’ embeddedness (i.e. relationships with other actors) influenced the levels at which they operated. For example, Woolworths operates at multiple levels, ranging from organisational to international (where it is part of international committees). When actors operate at multiple levels, they bring their ES knowledge to processes at various levels, which assists the spread of ES. For example, Woolworths interacts on global committees and brings this ES knowledge to Australia through its ES policies and, at the same
time, takes Australian issues to a global level, representing Australian interests on the
global committees.

5.2.11 Summary of spread of ES practices in the WA pork industry

The main process of spread relating to ES practices in the WA pork industry is the
slow, steady momentum of decades of *enacting and enforcing environmental
legislation and reporting requirements* (S1). Assisting this process of spread is the
related process of spread arising from *joint government/industry projects* (S2). Table
22 summarises the other processes of spread found in the WA pork industry. Notably
low in prevalence is the use of green SCM by Coles and Woolworths with *Australian
suppliers*, suggesting they are not using their full power to spread ES practices in the
WA pork industry. However, they use green SCM to improve ES practices in foreign
suppliers of house-brand products. Each of the macro-processes in Table 22 arises
from multiple interacting sub-processes that, in turn, are made up of additional
multiple interacting processes in an interactive progression. The processes occur in
series and parallel, resulting in emergent macro-processes and occur at multiple
levels (such as international, national, state, industry, supply chain, and dyadic).

5.2.12 Factors influencing spread of ES practices in the WA pork industry

5.2.12.1 Factors promoting the spread of ES practices in the WA pork industry

Table 23 tabulates the factors promoting the spread of ES practices in the WA pork
industry that emerged from the data.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Examples of relevant quotes from interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Enabling international, Australian, WA, industry and organisational aspects</td>
</tr>
<tr>
<td></td>
<td>1) Res6 commented that because the pork industry “have got profit they are able to employ good animal welfare practices, good environmental practices, they are able to pay staff really well you know, they are able to generate income for their community, they are able to put into national marketing campaigns, all that sort of stuff that they need to do as a whole of industry.”</td>
</tr>
</tbody>
</table>
**Factor Examples of relevant quotes from interviews**

<table>
<thead>
<tr>
<th>2</th>
<th>Embeddedness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Res6 (farm consultant and former DAFWA official) who had been told by an Australian Government official related to the pork industry that “at the national level, I can make 17 phone calls and I've got 80% of my pork supply covered.” Res6 thus concludes that this limited number of farmers means that change can be spread quickly in the national pork industry.</td>
<td></td>
</tr>
</tbody>
</table>

**Enabling international, Australian, WA, industry and organisational aspects**

Activities at international (such as UN conferences on climate change and international agreements such as the Kyoto Protocol), Australian (such as Australian participation in international ES initiatives, Australian Government environmental legislation and ES grants) and WA (e.g. joint government/industry projects such as FFF) levels provided an enabling and supportive environment for the development and spread of ES practices in the WA pork industry. Further, Australia’s first world status means local consumers have high expectations about Australian organisations’ ES practices and high GDP (gross domestic product) per capita, which provides an enabling environment for the spread of ES practices. Indeed, Res6 noted margins in the WA pork industry allow ES practices to be implemented. Contrast this with the environment in poor, third world countries in which the population needs protein and is unlikely to be as interested in ES issues (Res11 2012).

The active role played by government and industry representative organisations also forms part of the WA pork industry’s enabling environment. Interviewees indicated the influence of organisation specific factors, such as an organisation’s economic sustainability, size, proximity to final consumers and the types of product produced on the spread of ES practices (Res28 2012, Res27 2012, Res6 2013).

**Embeddedness**

The relationships between the small number of key actors in the WA pork industry also played a role. As Res6 noted (Table 23) key actors in the Australian pork industry can be contacted by making 17 phone calls. This helps the spread and the
speed of industry changes. Good relationships between government, industry representative organisations and industry also assisted in the spread of ES practices.

### 5.2.12.2 Barriers to the spread of ES practices in the WA pork industry

The data suggested a number of barriers to the spread of ES practices, which are summarised in Table 24, in which examples of relevant quotes related to these factors are provided. Subsequent sections provide more detail on these barriers.

#### Table 24: Barriers to the spread of ES practices in the WA pork industry

<table>
<thead>
<tr>
<th>Factor</th>
<th>Examples of relevant interview quotes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Cost and lack of economic sustainability</td>
<td>1) Res18 of OrgI: “unless the ‘green’ argument is driven by economics it won't get driven.”</td>
</tr>
<tr>
<td></td>
<td>2) Res17 of OrgH: “at the end of the day everything could be ‘green’ and all nice and everything but you know we are all in business so it needs to be commercially viable as well.”</td>
</tr>
<tr>
<td></td>
<td>3) Res22 of DAFWA: “from a green perspective you know if it starts to cost you money then that’s a big disadvantage if you are going to try to compete in an international market.”</td>
</tr>
<tr>
<td>2 Lack of consumers’ willingness to pay for ES attributes</td>
<td>1) Res3 of DAFWA: “I’m not sure if there is a lack of demand but there is a lack of willingness to pay.”</td>
</tr>
<tr>
<td></td>
<td>2) Res3: “people have an aspiration to lead a healthy life and protect the environment and so on. But what they actually do and their aspiration of is limited by a whole range of forces - whether they can afford it, whether they are just lazy, whether they know enough about it, whether their friends are doing it.”</td>
</tr>
<tr>
<td></td>
<td>3) Res2 of DAFWA: “all the consumer research we have seen … it goes price, quality, food safety, value for money, type calculations and then the rest is in there by a long distance. ‘Local’ is there.”</td>
</tr>
<tr>
<td></td>
<td>4) Res3 added that “pricing and convenience tends to sit at the top.”</td>
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<tr>
<td></td>
<td>5) Res15 of food distribution company OrgG: “there is more of a push for healthy and quality food definitely” than ES.</td>
</tr>
<tr>
<td></td>
<td>6) Res27 of OrgA: “At the end of the day the consumers don’t see a real advantage in the company who may be ‘green’ versus a company which may not be.”</td>
</tr>
<tr>
<td>Factor</td>
<td>Examples of relevant interview quotes:</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>7) <strong>Unintended consequences, trade-offs and inconsistencies</strong></td>
<td>7) Res3: “the commitment consumers have to it [buying green] is limited by [economic circumstances].”</td>
</tr>
<tr>
<td>8) <strong>Lack of integration and ‘big picture’ thinking</strong></td>
<td>8) Res22: Singaporean pork consumers “are more interested in taste …[]… From an Australian perspective ‘green’ is a very great thing. But in terms of going to overseas countries and asking for a premium they just say ‘forget it’.”</td>
</tr>
<tr>
<td>3) <strong>Unintended consequences, trade-offs and inconsistencies</strong></td>
<td>1) Res21: “The mainstream pork industry has been concerned, and the regulators again, about the potential damage that these outdoor piggeries could do to the environment as well …[]… That is a twist.”</td>
</tr>
<tr>
<td>4) <strong>Lack of integration and ‘big picture’ thinking</strong></td>
<td>2) Res21: Coles “haven't really cottoned on to the green aspect to promote it then. So far they've focused just purely on the welfare aspects and in the process have possibly created an environmental issue …[]… So you can see how it has almost gone full circle.”</td>
</tr>
<tr>
<td>5) <strong>ES practices associated with public goods</strong></td>
<td>1) Res8: “There are lots of things happening …[]… But there is nobody pulling the threads together.”</td>
</tr>
<tr>
<td>6) <strong>Unfavourable international, Australian, WA, industry and organisational aspects</strong></td>
<td>2) Res8: “You are not talking about snap decision, you're talking about well we are here now and we want to be there in 50 years’ time; so we have got 50 years to plan for that, but also put the infrastructure in, put the strategies in, educate the people, talk about you know quarantining land.”</td>
</tr>
<tr>
<td></td>
<td>3) Res8 contends “it has got to be integrated - and the dilemma then is you've got to have a government at the Australian level and at the state level that sees the ‘bigger picture’. And unfortunately most governments are just basing their operations on survival for the electoral cycle and trying to get elected again.”</td>
</tr>
<tr>
<td></td>
<td>1) Res2 of DAFWA: “we are going through another economic crisis right now and putting people out of work. How much interest will there be in environmental stewardship then?”</td>
</tr>
<tr>
<td>Factor</td>
<td>Examples of relevant interview quotes:</td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>7 Multiple and competing business objectives</td>
<td>1) Woolworths 2005 SR: “Some of the environmental objectives we have set are straightforward - reducing energy consumption and increasing waste recycling, for example. However, some are more complex where finding a balance between competing objectives is more difficult to achieve. For example, how far do we reduce food packaging without compromising food safety? How do we continue to reduce general waste disposal against a backdrop of increased sales activity in our stores?” (Woolworths Ltd 2005, p. 2).</td>
</tr>
</tbody>
</table>

Cost and lack of economic sustainability

Economic sustainability dominated environmental sustainability, as all interviewees expressed this opinion and the supermarket review came to the same conclusion. Thus, unless an ES practice is required by law, the practice must have an economic benefit to spread. Government economic assistance improved such economic benefits and, hence, encouraged adoption. For example, Australian Government funding supported OrgA’s move to a low temperature system at their rendering plant.

Lack of consumers’ willingness to pay for ES attributes

The data concurred with research that shows cost, convenience and health are dominant trends in Australian consumption patterns (IBISWorld 2013). Similarly, Woolworths 2011 SR cited research suggesting customers want value for money, choice, quality, good service and healthy options (Woolworths Ltd 2011). As previously mentioned, the interviews and the result of the FFF project suggest Australian consumers are not willing to pay for ES credentials, which hinders the spread of ES practices. Res11 suggested poorer consumers in export countries are not concerned with ES or animal welfare attributes but, rather, with cost, with ES being “a first world problem” (Res11 2012) and that in countries such as Indonesia, Bangladesh, or Ethiopia “consumers…need protein to eat.”
**Unintended consequences, trade-offs and inconsistencies**

A further barrier to spread was the unintended consequences, trade-offs and inconsistencies of ES practices. Res21 explained that, ‘free range’ piggeries had emerged in response to the call for ‘sow stall free’ pork, which had created ES issues that needed to be managed. In response to the environmental implications of such pig systems, a national environmental guideline for free range and outdoor grown piggeries was being developed (Res21 2012). A trade-off was described by Res22 (2012), who noted “recycling is a good thing but we need to use energy to recycle.”

**Lack of integration and ‘big picture’ thinking**

Res8 from the DER commented that, although there were many ES practices and projects, there is little higher level integration or ‘big picture’ thinking, such as governments considering land use for agriculture or mining. Res8 highlighted that there needed to be a gradual and planned movement towards sustainability, with a “paradigm shift” by governments and the public. Res8 had experienced short-term and narrow-minded approaches in sustainability reports he reviewed. Some sustainability reports failed to consider what was to happen to infrastructure when the project was over. Res8 was concerned that governments often adopted a short-term approach to sustainability issues, as they focus on the electoral cycle, which hinders action designed to improve long-term sustainability.

Res9 from WALGA suggested there was often a dearth of successful interactions between local governments and the State Government about ES projects, although he recounted more successful interactions between local governments and the Australian Government. Although there is a COAG (Council of Australian Governments), which provides a forum for interaction between local, state and Australian Government, further integration would benefit spread (Res9 2013; Res10 2013).

**ES practices associated with public goods**

The interviews suggested many ES practices were related to public goods and, hence, private companies were unwilling to absorb their costs as this would benefit others (sometimes competitors). Thus, in the absence of government intervention, such practices were unlikely to be implemented.
Unfavourable international, Australian, WA, industry and organisational aspects

There were barriers at multiple levels that mitigated spread. For example, at an international level, a lack of consensus among nations about ES issues, such as climate change, was a barrier to the global spread of ES practices and to their spread at national and industry levels. Policy instability can also reduce the spread of ES practices, as seen in the implementation of the carbon pricing scheme in 2012 and its repeal in 2014. The FFF project (section 5.2.6.5) suggested many barriers to the spread of ES practices in relation to joint government/industry projects. Company size can also act as a barrier, as illustrated by Res22 from DAFWA, who explained that small pork farmers do not have the resources and scale to use some ES practices. According to Res11, it is difficult to differentiate some agrifood products’ ‘green’ credentials, which hinders the spread of ES practices.

Multiple and competing business objectives

As noted in the Woolworths quote in Table 24 and as indicated in the interviews, the agrifood businesses face competing business objectives and demands on resources, such as food safety and occupational health and safety. The interviews suggested voluntary (i.e. not legislated) ES practices are low on the list of priorities for many businesses.

5.2.13 Case A1 summary

Case A1 illustrated the multiple, interacting processes of spread that contributed to the slow, steady momentum of spread of ES practices in the WA pork industry. Decades of enforcing environmental legislation, regulations and reporting requirements have resulted in the ‘clean and green’ reputation enjoyed by the WA pork industry. The events making up the processes and sub-processes of spread arose at multiple levels (such as international, Australian, WA, WA pork, supply chain and organisational levels). The factors promoting spread as well as the barriers to spread were discussed. While Case A1 investigated the spread of multiple types of ES practices, Case A2 looked at the spread of a particular group of practices (‘sow stall free’ practices) in the WA pork industry that followed a different spread pattern to those discussed in Case A1; which is presented next.
5.3 Case A2: WA pork industry - spread of ‘sow stall free’ practices

5.3.1 Introduction

In 2010, the Australian pork industry announced it would voluntarily phase out sow stalls by 2017; this voluntary approach being a world first (APL 2014a). By the end of 2013, the Australian pork industry was virtually sow stall free, ahead of the planned deadline (Wesfarmers Ltd 2013b; Woolworths Ltd 2013a). Interviews and industry documents (such as the FFF pork industry baseline document (England et al. 2009)) suggest animal welfare issues (in particular the use of sow stalls) is a very topical issue in the pork industry. While environmental sustainability issues have been in focus in the Australian pork industry for decades, as indicated in Table 21, Res21 believed animal welfare issues came into focus in the 2000s, peaking in 2010 (Res21 2012). As the Australian pork industry was virtually sow stall free in 2013, these practices spread rapidly when compared to the slow, steady momentum of the spread of the ES practices discussed in Case A1.

5.3.2 Events relevant to the spread of sow stall free practices

Table 25 shows the chronological order of events cited in interviews, newspaper reports and industry documents that guide an understanding of the spread of sow stall free practices in the WA pork industry. The first column shows the time in years, while column B shows events occurring at the international level that relate to this spread. Column C isolates the events in the British pork industry that interviewees suggested affected the Australian and WA pork industry. Column D shows the Australian pork industry events and column E the WA pork industry events.

As can be seen in Table 25, the UK had an international leadership role in pork animal welfare by introducing animal welfare rules, including the banning of sow stalls, in 1999 (Mother Nature Network 2012). The rest of the EU had until 2013 to adopt these animal welfare rules. The banning of sow stalls, ahead of competitor countries, caused a collapse in the British pig herd, as British pork became more expensive, leading to increased imports of pork from countries in which sow stall free legislation was not yet in effect (The Telegraph 2009). Res22 from DAFWA suggested British welfare rules “decimated an industry. It shrunk to probably a third of its size” and noted Britain “didn't produce enough pork, so a lot of pork was
coming in from Europe and it was being produced in stalls …[…] and it was being produced cheaper.”

Interviewees indicated that the Australian (and WA) pork industry is influenced by the UK pork industry (Res24 2012; Res21 2012; Res22 2012), as “they [UK] have probably been between five and ten years ahead over there” (Res24 2012). Table 25 supports this assertion. Sow stalls were banned in the UK in 1999 and, in 2010, the sow stall issue peaked in Australia (11 years later). The supermarket review suggested UK supermarkets, especially Sainsbury, have had an animal welfare focus for the ten year review period (2004-2013) and prior to the review period, well ahead of Australian supermarkets’ focus on sow stalls (2010). Interviewees argued the Australian pork industry was aware of the banning of sow stalls in Britain in 1999 and an expected banning in the EU (Res21 2012; Res22 2012).

There are no national laws in Australia applying to animal welfare, as this responsibility falls to the states and territories (RSPCA 2013; Department of Agriculture 2014). However there is a national voluntary ‘Model Code of Practice for the Welfare of Animals.’
Table 25: Events relevant to the spread of sow stall free practices in the WA pork industry

<table>
<thead>
<tr>
<th>Year</th>
<th>International</th>
<th>British pork industry</th>
<th>Australian pork industry</th>
<th>WA pork industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A)</td>
<td>(B)</td>
<td>(C)</td>
<td>(D)</td>
<td>(E)</td>
</tr>
<tr>
<td>1</td>
<td>1987</td>
<td>1) Brundtland Report.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>1999</td>
<td>1) 1 Jan 1999 sow stalls banned in Britain.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2003</td>
<td>1) The EU are warned that they will need to phase out sow stalls by 2013.</td>
<td>1) WA Animal Welfare (General) Regulations 2003.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>2005</td>
<td></td>
<td>1) Animals Australia campaign against sow stalls (2005-2010).</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>2007</td>
<td></td>
<td>1) Rivalea, Australia’s biggest producer of fresh pork, decides to phase out sow stalls by 2014. 2) Animals Australia campaign against sow stalls.</td>
<td></td>
</tr>
<tr>
<td>Year</td>
<td>International</td>
<td>British pork industry</td>
<td>Australian pork industry</td>
<td>WA pork industry</td>
</tr>
<tr>
<td>------</td>
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</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td>1) 12 Jan. Jamie Oliver TV show ‘Jamie saves our bacon’ screened in Britain.</td>
<td></td>
</tr>
</tbody>
</table>
| 9    |               |                       | 1) 5 Aug ‘Jamie saves our bacon’ TV show screened in Australia.  
2) Dec: Coles asked by Australian consumers whether Coles uses pork farmed with sow stalls.  
3) Animals Australia campaign against sow stalls. |                 |
<p>| 10   | 1) GRI 3 series food processing sector supplement (including animal welfare. |                       |                         |                 |</p>
<table>
<thead>
<tr>
<th>Year</th>
<th>International</th>
<th>British pork industry</th>
<th>Australian pork industry</th>
<th>WA pork industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>2012</td>
<td>1) Feb 2012 McDonald’s (USA) will only source from sow stall free suppliers.</td>
<td>1) UK National Pig Association (NPA) ‘Save Our Bacon’ campaign to support British pig farmers.</td>
<td>1) APL: drafting of the ApIQ® free range standards, Model Code of Practice for Welfare of Animals: pigs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>2013</td>
<td>1) GRI 4 series published. 2) ‘Horsegate’ scandal.</td>
<td>1) Sow stalls banned in the rest of the EU. 2) UK National Pig Association (NPA) encourage Britain’s leading food companies to pledge total traceability for the imported pork they sell and to ensure that it is sourced from sow stall free compliant suppliers. 3) NPA ‘Wall of Fame’ initiative. 4) NPA ‘Exercise Compliance’ project. 5) April: McDonald’s UK announce that they are switching to 100 percent British Freedom Food labelled pork.</td>
<td>1) Jan. Animals Australia campaign against factory farming. 2) June. Coles agree to sell Animals Australia consumer bags. National Farmers Federation opposes this since they see Animals Australia to have an anti-farmer agenda. Coles removes the bags within 48 hours.</td>
</tr>
<tr>
<td>13</td>
<td>2014</td>
<td></td>
<td>1) From 2014 Coles no longer sells processed (and fresh) house-brand pork that has been farmed using sow stalls.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>2017</td>
<td></td>
<td>1) Date by which APL agreed to voluntarily phase out sow stalls.</td>
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</tbody>
</table>
In WA, DAFWA is responsible for animal welfare and there are a number of Acts and regulations dealing with animal welfare, such as the ‘WA Animal Welfare Act 2002’, as well as the ‘WA Animal Welfare (General) Regulations 2003’, as shown in Table 25. While animal welfare issues are addressed, sow stalls are not officially banned in the legislation, as in the UK or as demanded by animal welfare groups, such as Animals Australia, which has campaigned against the use of sow stalls in recent years (Animals Australia 2013).

As shown in Table 25, in 2007 Australia’s largest pork producer, Rivalea, in New South Wales, which is a major supplier to Woolworths, made a decision to phase out sow stalls by 2014, commenting: “We knew that, in terms of perceptions, it was going to be very difficult to defend [the use of sow stalls], so we did not want to end up in the situation in 10 years that we were left behind” (The Sydney Morning Herald 2012a, p. 1).

At the time of the FFF project (2005-2008), the use of sow stalls was recognised as a significant industry issue (England et al. 2009). Consultation took place between animal welfare groups, including Animals Australia and the Royal Society for the Prevention of Cruelty to Animals (RSPCA), industry, state and territory governments and the Commonwealth Scientific and Industrial Research Organisation (CSIRO), leading to the Australian Government’s endorsement of the pork industry’s model code of practice (England et al. 2009).

A further significant event highlighted by interviewees (Res21 2012; Res27 2012) was celebrity chef Jamie Oliver’s television show (‘Jamie Saves our Bacon’), which was screened in Britain in early 2009. The show encouraged British consumers to support the British pork industry, who were complying with a higher level of animal welfare standards than countries from which pork was being imported. In August 2009, Jamie Oliver’s show was screened in Australia. Res27 of OrgA explained that:

Coles “got more complaints at Christmas time, more questions from consumers about whether the pigs are in sow stalls for a lot of their lives, whether they are free range or not …[…] because there was a show Jamie Oliver put on …[…] and that brought the attention to some of the lives
some of the pigs live through. So that has driven a lot of changes certainly in the way that we operate but the industry operates.”

Res27 went on to explain:

“I think it [sow stalls] came to light because of Jamie’s show. It was quite sort of graphic …[...] and that then brought it to the attention of the consumers here in Australia and there are some animal activists that are out there all of the time and pushing this but I think it got more momentum. And then Coles has decided, just like they have gone hormone-free, and now they want to go ‘sow stall free’ …[...] because that is what their consumers are pushing for.”

In addition to the effect Jamie Oliver’s show had on Coles’ customers, Res21 believed Coles’ focus on sow stalls also arose because directors from Tesco in the UK (where the use of sow stalls was banned) came to work at Coles (Res21 2012). Thus, the Australian pork industry’s 2010 decision to phase out sow stalls came about because there was a series of important events and an environment conducive to the spread of sow stall free practices. The final impetus seems to have been Coles’ decision to no longer sell fresh pork under their house-brand from farmers using sow stalls. A media release suggested Coles was taking “the lead with its pork suppliers to phase out the use of sow stalls for raising pigs in Australia…[Our] customers are becoming increasingly interested in welfare issues surrounding pig farming, with the use of sow stalls their greatest concern” (Coles Media Release 2010, p. 1).

When Coles made their announcement, the immediate concern of Australian pork suppliers and pork industry representative organisations was whether Coles would apply the same ‘sow stall free’ criteria to processed pork (Res24 2012; Res21 2012). At the time, around 70% of processed pork was being imported from Denmark, Canada and the USA. Thus Australian pork processors and producers were concerned that they would be less competitive than other countries producing processed pork that did not have to be ‘sow stall free.’ Initially, Coles only placed a sow stall free ban on fresh, house-brand pork, but, later (in 2012) Coles announced the ban would also apply to house-brand processed pork.
Woolworths followed Coles’ lead in moving to ‘sow stall free’ house-brand fresh pork. The events culminated in November 2010, at the annual general meeting of APL, when the Australian pork industry agreed to voluntarily phase out sow stalls by 2017 (APL 2012). At the time, Rivalea went sow stall free immediately (they had been phasing out the use of sow stalls since 2007) (USDA Foreign Agricultural Service 2010). After Rivalea’s decision “the industry had no option but to follow” (Res21 2012).

In Wesfarmers 2012 sustainability report, it was reported that Coles had worked with pork suppliers to meet their sow stall free target early in response to a demand from customers for more responsibly sourced products. The 2012 sustainability report stated that Coles was absorbing production cost increases from this change so customers would not pay more for sow stall free pork (Wesfarmers Ltd 2012). Coles also noted that their local and imported house-brand ham and bacon (i.e. processed pork) was sow stall free. The 2013 Woolworths Ltd sustainability report made no claim about processed pork, but noted 99% of fresh pork was sourced from farmers who used sow stalls for less than 10% of the gestation period (Woolworths Ltd 2013a).

Res22 commented that, although Jamie Oliver’s show and Coles’ decision to source sow stall free house-brand pork were important events, the sow stall free issue “was building up anyway” and “that comes very much from Britain, that's where it really started.” Table 25 suggests animal welfare issues were acknowledged internationally later than ES issues. For example, the GRI 3 series reporting guidelines did not address animal welfare issues until the 2011 food processing sector supplement and the GRI 4 series in 2013; whereas environmental reporting has been addressed since 1997.

Table 25 shows other British measures to support their pork industry and its high welfare standards since 2010, which is likely to provide Australia with positive reinforcement for the industry decision to phase out sow stalls. The UK’s National Pig Association (NPA) recently ran a British pig farmers ‘Save Our Bacon’ campaign (NPA 2012), in which British shoppers were encouraged to look for the ‘Red Tractor’ logo, which proves the meat which is advertised as ‘high quality and high welfare’ comes from British farms (NPA 2012). In early 2013, the NPA set up a
‘Wall of Fame’ website, which lists British companies that have and have not made a commitment to ensure all their pork is sourced from suppliers who comply with new EU welfare directives (NPA 2013c). NPA also instituted an ‘Exercise Compliance’ project, in which imported pork products are selected randomly and British companies are asked to trace them back to the farm of origin (NPA 2013b). These campaigns gained traction from the 2013 ‘horsegate’ scandal, in which the Food Safety Authority of Ireland found horse DNA in beef burgers on supermarket shelves (The Guardian 2014), which reduced consumers’ faith in the food chain.

Another important UK event was McDonald’s announcement in April 2013 that they were switching to 100% British Freedom Food labelled pork, which adheres to RSPCA welfare standards (FreedomFood 2013). This decision arose partly from marketing data, which showed animal welfare standards ranked second in importance only to price and higher than traceability, British sourcing and organic credentials (FreedomFood 2013; McDonald's UK 2013). It is not the first time McDonald’s has adopted animal welfare sourcing criteria, as it switched to free range eggs in 1998 (McDonald's UK 2013).

By May 2013, the British NPA reported that 60% of EU countries did not have a sow stall ban (GlobalMeatNews.com 2013). They began tracing the sources of inputs in imported pork products claiming to be sow stall free (GlobalMeatNews.com 2013). Britain imports around 60 percent of its processed pork (NPA 2013a). These UK events are likely to have influenced the Australian pork industry’s decision to phase out sow stalls, assisting spread in Australia, highlighting events at an international, national and WA level that influenced the spread of sow stall free practices. The sequences of events in Table 25 highlights the British influence, the use of supply chain power, the role of imitation, and the role celebrity and media have on consumers and supermarkets.

5.3.3 Processes of spread of sow stall free practices in the WA pork industry

These sequences of events suggest there are multiple, interacting processes of spread operating at various levels and at different intensities, which are discussed in this section. Some processes do not seem to bring about spread on their own but, when combined with other processes, seem to bring about significant change. The
processes of spread of sow stall free practices that emerged from the data are summarised in Table 26. Column B shows the macro-processes of spread, while column C provides examples of sub-processes of spread contributing to the macro-processes of spread. In column D, the relevant events from Table 25 are shown, while column E provides examples of relevant quotes from interviews. Column F shows the prevalence of each macro-process (H=high, M=medium and L=low) for the various organisation types (farmers (F), processors (P) and retailers (R)). Where no data was obtained regarding the use of a process by an organisation type, this is indicated by ‘n/a’.

Contrasting Table 26 for sow stall free practices with Table 22 for ES practices suggests different patterns of prevalence of processes (discussed in section 6.2.2). Table 26 also shows additional processes of spread relating to sow stall free practices (S12 and S13) and the absence of data relating to the ‘spread through intermediaries’ process which occurred in Case A1.
Table 26: Processes of spread of sow stall free practices in the WA pork industry  
(H=high, M=medium, L= low and n/a = not applicable. F=farmers, P=processors and R=retailers)

<table>
<thead>
<tr>
<th>Macro-processes of spread</th>
<th>Examples of sub-processes of spread</th>
<th>Relevant events from Table 25 and other evidence</th>
<th>Examples of relevant quotes from interviews / other evidence</th>
<th>Prevalence for farmers, processors and retailers</th>
</tr>
</thead>
</table>
| **S1** Enacting and enforcing legislation, regulations and reporting requirements | 1) Enacting and enforcing the WA Animal Welfare Act of 2002.  
2) Developing and enforcing the WA Animal Welfare (General) Regulation 2003. | C2.1, E3.1, E4.1, D11.1, C12.1, interviews |  | L L L |
| **S3** Developing and implementing voluntary agreements and reporting requirements | 1) Rivalea voluntarily phasing out sow stalls in 2007.  
<table>
<thead>
<tr>
<th>Macro-processes of spread</th>
<th>Examples of sub-processes of spread</th>
<th>Relevant events from Table 25 and other evidence</th>
<th>Examples of relevant quotes from interviews / other evidence</th>
<th>Prevalence for farmers, processors and retailers</th>
</tr>
</thead>
<tbody>
<tr>
<td>S4 Spread through consumers demanding sow stall free practices</td>
<td>1) Consumers contacting Coles in Dec 2009 to enquire about Australian use of sow stalls (Res27). 2) Consumers contacting OrgD to ask about their animal welfare practices (Res24).</td>
<td>D8.2, D9.1, interviews, supermarket review</td>
<td>1) Res24: “I wouldn't say that government or legislation is driving a lot of this. It tends to be from industry or consumers, in my view …[…]… so we have to react to what our consumers want.” 2) Coles: “customers are becoming increasingly interested in welfare issues surrounding pig farming, with the use of sow stalls their greatest concern” (Coles Media Release 2010, p. 1).</td>
<td>H H H</td>
</tr>
<tr>
<td>S5 Spread through (international) movement of staff</td>
<td>1) Spread through movement of Tesco (UK) directors to Coles (Res22). 2) OrgD hiring staff from the UK bringing experience to WA pork industry (Res24).</td>
<td>Interviews</td>
<td>1) Res22: Coles “are driven now by… they are quite open about having brought in some of their executives are from Tesco's. So they are UK-based. So they are implementing what they implemented in the UK.”</td>
<td>H H H</td>
</tr>
<tr>
<td>S6 Spread through actors wanting to ‘do the right thing’</td>
<td>1) OrgA implementing animal welfare practices because the shareholders want to ensure that the company is ‘doing the right thing’.</td>
<td>Interviews</td>
<td>1) Res27 of the Board: “they want to know that we are doing you know the right thing.”</td>
<td>L n/a n/a</td>
</tr>
<tr>
<td>Macro-processes of spread</td>
<td>Examples of sub-processes of spread</td>
<td>Relevant events from Table 25 and other evidence</td>
<td>Examples of relevant quotes from interviews / other evidence</td>
<td>Prevalence for farmers, processors and retailers</td>
</tr>
<tr>
<td>---------------------------</td>
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</tr>
</tbody>
</table>
| S7 | **Green supply chain management** | 1) Coles assisting and insisting that Australian suppliers move to sow stall free practices.  
2) Woolworths also requiring suppliers to move to sow stall free practices. | D9.1, D12.2, interviews, supermarket review | 1) Res27 from OrgA: “the pressures for animal welfare definitely comes from the Coles of the world even less so Woolworths but Coles.”  
2) Res21: “That decision by a major retailer [Coles] caused a massive impact on the way pigs are kept.” |
| | |  | | | H H H |
| S8 | **Spread by organisations choosing to pursue green marketing** | 1) Coles launching 'sow stall free' pork campaign in 2010.  
2) Rivalea moving to sow stall free practices in 2007. | D9.1, D9.2, B11.1, C12.5, D12.2, D13.1, interviews, supermarket review | 1) Res22: “I think the thing with Coles … their main aim will be to differentiate from Woolworths …[...] we all do the same; we follow the trends that are going to be beneficial. They [Coles and Woolworths] have to think that will give them the marketing edge.” | L M H |
| S9 | **Spread due to international influence and global committees** | 1) Spread due to banning of sow stalls in Britain (1999) and the EU (2013).  
2) UK National Pig Association campaigns to support British high welfare pork.  
<table>
<thead>
<tr>
<th>Macro-processes of spread</th>
<th>Examples of sub-processes of spread</th>
<th>Relevant events from Table 25 and other evidence</th>
<th>Examples of relevant quotes from interviews / other evidence</th>
<th>Prevalence for farmers, processors and retailers</th>
</tr>
</thead>
<tbody>
<tr>
<td>S10</td>
<td><strong>Spread through pursuit of economic sustainability</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1) OrgA building tunnel-ventilated sheds which increases pig welfare and also has productivity benefits.</td>
<td>Interviews, supermarket review</td>
<td>1) Res27 of OrgA regarding tunnel-ventilated sheds: “there are a whole lot of reasons that make it a financial decision as much as it does the animal welfare of pigs […] both of them stack up. We are spending 10 million dollars on sheds … you wouldn’t do that if there wasn’t a return that would come about as a result.”</td>
<td>M M H</td>
</tr>
<tr>
<td></td>
<td>2) Coles and Woolworths pursuing ‘sow stall free’ campaign to gain marketing (and economic) advantage.</td>
<td></td>
<td>2) Res23 regarding keeping pigs cool during transportation: “without being regulated our transport operators, because of their practical experience, were complying with international loading regulations without being regulated.”</td>
<td></td>
</tr>
<tr>
<td>S11</td>
<td><strong>Imitating</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Macro-processes of spread</td>
<td>Examples of sub-processes of spread</td>
<td>Relevant events from Table 25 and other evidence</td>
<td>Examples of relevant quotes from interviews / other evidence</td>
<td>Prevalence for farmers, processors and retailers</td>
</tr>
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</tr>
<tr>
<td>S12 Spread through celebrity campaigns</td>
<td>1) Jamie Oliver ‘Jamie saves our bacon’ campaign to promote high welfare British pork.</td>
<td>C8.1, D8.1, D8.2, D9.1, interviews</td>
<td>1) Res27: “there was a show Jamie Oliver put on …[…]… and that brought the attention to some of the lives some of the pigs live through. So that has driven a lot of changes certainly in the way that we operate but the industry operates.”</td>
<td>H H H</td>
</tr>
<tr>
<td>S13 Spread through animal welfare campaigns</td>
<td>1) Animals Australia campaigns from 2005-2010 and in 2013.</td>
<td>D5.1, D6.2, D7.2, C8.1, D8.1, D8.2, D8.3, D9.1, D9.4, B11.1, C12.5, D12.1, D12.2, interviews, supermarket review</td>
<td>1) Res21: sow stall free practices “are probably driven by activists, welfare activists, and to some extent amplified by the retailers.” 2) Res21: “the welfare code is not far behind. It’s probably only three years difference, that’s a direct result of the welfare lobby shall we call it. The activists and so on independent of the supermarkets, but the supermarkets just jumped on the band wagon.”</td>
<td>H H H</td>
</tr>
</tbody>
</table>
5.3.3.1 Enacting and enforcing legislation, regulations and reporting requirements

Although Australia has not banned sow stalls (like Britain in 1999), there is a history of animal welfare legislation at a state level, such as the WA Animal Welfare Act of 2002. As the move by the Australian pork industry to sow stall free practices was voluntary, a ‘low’ level of prevalence was assigned to this process. However, the British and EU legislation banning sow stalls and the potential pending legislation in Australia are likely to have influenced the voluntary process in Australia, according to Res21. It is interesting that, here, industry practices were ahead of legislation, whereas with ES practices, the legislation often led industry practice.

5.3.3.2 Forming and implementing joint government/industry projects

There have been joint projects with many actors collaborating on the development of industry regulations and guidelines about pig animal welfare, such as the development of a model code of practice for the welfare of pigs (2008) and the FFF project (2005-2008). However, these projects did not ban the use of sow stalls; hence the ‘low’ prevalence level of this process.

5.3.3.3 Developing and implementing voluntary agreements and reporting requirements

As shown in Table 26, there are no statuary reporting requirements about sow stalls. At an international level, animal welfare issues received attention later than environmental issues. For example, the GRI guidelines mentioned animal welfare for the first time in 2011. Although the supermarket review showed a long history of animal welfare reporting in the Sainsbury SRs, Coles and Woolworths have only focused on sow stalls more recently (since 2010) and Walmart did not focus on animal welfare in the review period. There has been voluntary reporting on animal welfare issues in retailers’ SRs; hence the allocation of a ‘high’ prevalence level for this process. Some farmers have voluntarily phased out sow stalls; hence the assignment of ‘medium’ prevalence to the farmers. The process does not relate to processors.
5.3.3.4 Spread through consumers demanding sow stall free practices

The interviewees noted animal welfare issues were more marketable to consumers than ES issues (Res2 2012; Res3 2012; Res25 2012; Res26 2013). Thus, this process was assigned a ‘high’ level of prevalence. While Animals Australia campaigned against the use of sow stalls from 2005-2010, consumer interest peaked at the time Jamie Oliver’s show was screened in Australia (2009). People’s interest in sow stall issues was communicated to Coles through consumer feedback and Coles argued their action to become sow stall free arose from consumer demand. An aspect of this process is consumer education about sow stalls, such as through Coles and Woolworths sow stall free marketing campaigns, the ‘Jamie saves our Bacon’ television show and the Animals Australia campaign against sow stalls and factory farming.

5.3.3.5 Spread through (international) movement of staff

The interviewees argued spread occurred when managers, predominantly from the UK, came to Australia. Res21 believed Coles’ focus on sow stalls arose because managers came from Tesco in the UK to Coles, while Res24 suggested staff from Britain and Europe hastened the spread of sow stall free practices; hence the assignment of ‘high’ to this process.

5.3.3.6 Spread through actors wanting to ‘do the right thing’

Res27 mentioned spread occurred as a result of pressure from their Board to ‘do the right thing’ about ES and animal welfare issues. However, this process was not found in other data relating to the spread of sow stall free practices; hence the assignment of ‘low’ prevalence to farmers and ‘n/a’ to processors and retailers.

5.3.3.7 Green supply chain management

The sequences of events in Table 25 suggest the sow stall free spread is an illustration of the use of green SCM by Coles and Woolworths; hence the assignment of ‘high’ prevalence for retailers. SCM practices are used by the retailers to control Australian pork suppliers, rather than foreign suppliers. Res28 explained Australia (and the major supermarkets) are not large enough to demand sow stall free practices
from suppliers of processed pork in countries from which they import, such as the USA.

The large Australian supermarkets have the power to bring about rapid, industry-wide change in practices when desired. Res27 indicated that Coles worked with OrgA and even offered a slight increase in price to cover the cost of implementing sow stall free practices, demonstrating the use of a collaborative approach with some suppliers. Res28 explained Coles put pressure on OrgC to supply sow stall free product, which led OrgC to put pressure on their domestic suppliers, showing SCM further along the supply chain. OrgC’s main domestic supplier (OrgA) is also a direct supplier to Coles and Coles audit OrgC and OrgA; hence the ‘high’ prevalence assigned to processors and farmers.

5.3.3.8 Spread by organisations choosing to pursue green marketing

The large Australian supermarkets have focused on marketing ‘sow stall free’ and other animal welfare issues since 2010 in their sustainability reports. Many interviewees (Res28 2012; Res21 2012; Res22 2012) argued Coles’ interest in ‘sow stall free’ is based on a green marketing campaign and to win market share from Woolworths. Hence, ‘high’ prevalence is assigned to retailers. Interviewees suggested farmers were not actively marketing sow stall free; hence the ‘low’ level assigned. Processors, such as OrgC, look for green marketing opportunities; hence the assignment of the ‘medium’ level of prevalence for this organisation type.

5.3.3.9 Spread due to international influence and global committees

As noted, the interviewees pointed out that the Australian pork industry is significantly influenced by the British pork industry and tends to lag this industry by 5 to 10 years (Res21 2012; Res22 2012). Res22 believed the sow stall issue was imminent due to the events in Britain, even before Jamie Oliver’s show. Events such as banning sow stalls in the UK in 1999 and the EU in 2013 influenced the WA pork industry; hence the assignment of ‘high’ prevalence for this process.

5.3.3.10 Spread through pursuit of economic sustainability

Interviewees highlighted that animal welfare practices needed to make financial and animal welfare sense. Res27 explained that when OrgA invested in tunnel ventilated
sheds that shield pigs from extreme weather conditions, it saw a net economic benefit
due to productivity increases. Some farmers, such as OrgA, were helped financially
by Coles in the move to sow stall free practices, who was using sow stall free pork as
a marketing campaign and believed there was a net economic benefit; hence the
assignment of a ‘high’ level to retailers, while farmers and processors were assigned
a ‘medium’ level of prevalence.

5.3.3.11 Imitating

Case A2 illustrates a number of instances of the process of imitation (e.g. the
Australian pork industry imitated the UK pork industry and Woolworths imitated
Coles’ policy to source from sow stall free suppliers for fresh pork), suggesting a
‘high’ level of prevalence of this process.

5.3.3.12 Celebrity campaigns

Case A2 illustrated the power of celebrity campaigns such as Jamie Oliver’s
campaign to bring about industry changes, which crossed national borders (UK to
Australia). Res27 believed Jamie Oliver’s campaign created consumer pressure,
which led to Coles’ response on this issue. This led Coles to put pressure on their
suppliers and to Woolworths imitating Coles so as not to give Coles a ‘point of
difference’, resulting in the Australian pork industry deciding (though APL) to phase
out sow stalls. These processes sought to avoid probable legislation in Australia as in
the UK and EU.

5.3.3.13 Animal welfare campaigns

The Animals Australia website points out it had campaigned against sow stalls from
2005 until 2010, when the Australian pork industry went sow stall free. It seems their
campaign created awareness but would not have succeeded without potential pending
legislation in Australia, British legislation and Coles’ support. However, the
campaign provided an environment in which other spread processes could succeed,
hence the ‘high’ prevalence level.
5.3.4 Composition of the processes

Case A2 shows the spread of sow stall free practices in the WA pork industry occurred as a result of multiple, interacting processes, shown as ‘macro-processes’ in column B of Table 26. Each of these processes arose from other multiple, interacting sub-processes, examples of which are provided in column C of Table 26. This iterative progression into further interacting sub-processes can be continued until the required level of detail is accomplished.

5.3.5 Interaction between the processes

Case A2 suggests some processes were not successful in isolation in phasing out sow stalls. Rather, the industry-wide process occurred when multiple processes occurred in series (in sequence over time) and in parallel (concurrently in time). Some processes provided the momentum for the later rapid spread of sow stall free practices. For example, while the Animals Australia campaign was a background process, it needed Jamie Oliver’s campaign and Coles’ response to bring about widespread change. Britain’s banning of sow stalls in 1999 did not spread to Australia at the time, but contributed to the spread that occurred in later years.

5.3.6 Multiple levels

The processes of spread and the events relating to the spread of sow stall free practices occurred at international, national (Australian and British), pork industry and WA pork industry levels.

5.3.7 Summary of spread of sow stall free practices in the WA pork industry

Sow stall free practices resonated with consumers and were marketable, as demonstrated by Coles’ marketing campaign. The case highlights the impact consumer demand and interest can have on a practice, as they create a potential marketing advantage for a retailer. Supply chain management, rather than legislation, was a key process in the spread of sow stall free practices. To get wide spread across the industry, the process needed actors with power and influence (e.g. Jamie Oliver, Coles and Rivalea). Potential legislation, similar to that passed in Britain and the EU also created an environment in which companies were willing to pre-empt such laws to gain an enhanced reputation. Further, the industry had the resources needed to
implement the change. If this was not the case the industry may have been decimated, as in Britain.

5.3.8 Factors influencing the spread of sow stall free practices in the WA pork industry

The following section discusses the factors influencing the spread of sow stall free practices in the WA pork industry. First the factors promoting spread are analysed, after which barriers to spread are examined.

5.3.8.1 Factors promoting the spread of sow stall free practices in the WA pork industry

The factors promoting spread that emerged from the analysis can be seen in Table 27.

Table 27: Factors promoting the spread of sow stall free practices

<table>
<thead>
<tr>
<th>Factor</th>
<th>Examples of relevant quotes from interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Enabling international, Australian, WA, industry and organisational aspects</strong></td>
</tr>
<tr>
<td>2</td>
<td><strong>Embeddedness</strong></td>
</tr>
<tr>
<td>3</td>
<td><strong>Marketability</strong></td>
</tr>
</tbody>
</table>

*International, Australian, WA, industry and organisational aspects*

These are the international, national, state and industry level factors that, together, provided an enabling and supportive environment for the development and spread of sow stall free practices in the WA pork industry. For example, the lead taken by the UK in banning sow stalls in 1999, with the EU following in 2013, led to an environment in which the Australian pork industry was aware of the potential for such legislation in Australia. Another example was Sainsbury’s focus on animal welfare in their sustainability reports, which created awareness about animal welfare issues. Further, the margins in the Australian pork industry enabled sow stall free practices to be implemented without financial ruin (Res6 2013).
**Embeddedness**

As mentioned earlier, Res6 noted the major actors in the WA pork industry could be contacted by making 17 phone calls, suggesting there were only a small number of key actors, which enabled spread to occur more easily. Further, the relationships of Coles and Rivalea within the pork industry enabled their decisions to move to sow stall free pork to spread more rapidly through the industry.

**Marketability**

Interviewees argued animal welfare was easier to market than general ES practices, as it resonates with consumers. Coles’ ability to use ‘sow stall free’ as a marketing tool meant Coles used its SCM power to bring about changes in its supply chain.

**5.3.8.2 Barriers to the spread of sow stall free practices in the WA pork industry**

The data from the case study indicates the following barriers to spread of sow stall free practices, which are summarised in Table 28.

### Table 28: Barriers to the spread of sow stall free practices

<table>
<thead>
<tr>
<th>Factor</th>
<th>Examples of relevant interview quotes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Cost and lack of economic sustainability</td>
<td>1) Res27 of OrgA: “We haven’t up to now got a premium for it [sow stall free pork]. But we are having a lot of extra costs attached to it like changing the sow stalls. It has a price tag of about A$800 000 to it. So if you are not going to get one more cent for the pigs then that is a difficult thing to have to do.”</td>
</tr>
<tr>
<td>2 Different rules in different countries</td>
<td>1) Res21: “It’s very hard to put welfare constraints on imports.”</td>
</tr>
<tr>
<td></td>
<td>2) Res28: “most of our [Australian] frozen pig meat will come from North America. And if you look at the size of the Australian market to the North American market where they have got 360 million and we've got 20 million. We are very very small players. So we probably wouldn't be able to drive the behaviours of those people anyway. So if it's domestic, if they have got domestic pressure over there, the spin-off is that we may be able to get imported meat that is sow stall free.”</td>
</tr>
</tbody>
</table>
**Cost and lack of economic sustainability**

Costs impact on the spread of sow stall free practices. Britain saw a contraction in the industry after the banning of sow stalls in 1999, as British costs increased and buyers imported pork from lower-cost countries. It can be expensive to move to sow stall free practices (The Sydney Morning Herald 2012a). Indeed, the decision by the Australian pork industry to phase out sow stalls is estimated to have cost A$95 million (USDA Foreign Agricultural Service 2010). Rivalea’s movement to sow stall free production is reported to have cost A$16 million (USDA Foreign Agricultural Service 2010). Res27 argued consumers were only willing to pay a small premium for sow stall free pork, which may explain why Coles had assisted OrgA to do so.

**Different rules in different countries**

The case illustrates the problems that emerge when different countries have different rules. Britain’s decision to ban sow stalls ahead of other countries decimated their pork industry, as companies imported pork (Res22 2012). The case showed that while the large Australian supermarkets had the supply chain power to change sow stall practices in Australia, they did not have the purchasing power to change practices in other countries (Res28 2012). Res34 made the point that “and then they just import ones that aren't sow stall free”, referring to the problem of different laws in different countries.

**5.3.9 Summary of Case A2**

Case A2 illustrated the spread of sow stall free practices in the WA pork industry. This spread was rapid, particularly from 2010 and occurred voluntarily and Australia-wide. It arose from multiple interacting processes occurring in series and parallel. The use of the large supermarkets’ supply chain power with Australian suppliers can be seen, as well as processes created by green marketing, celebrity campaigns and animal welfare campaigns. The success of these processes was dependent on consumer demand for sow stall free pork products. Next, Case B is presented which investigates the spread of ES practices in the WA dairy industry.
5.4 Case B: WA dairy industry

5.4.1 Introduction

This case investigated the spread of ES practices in the WA dairy network. The analysis starts with some background relating to the WA dairy industry, followed by an analysis of the processes of spread and the factors influencing spread.

5.4.2 A background to the WA dairy industry

Dairy products include milk, cheese, cream, butter, yoghurt, powdered milk, dairy desserts and ice cream (IBISWorld 2012b). The major dairy processors and wholesalers in Australia are Lion Pty Ltd (21%) (Japanese owned), Murray Goulburn Co-operative Co Limited (15%) (Australian co-operative), Fonterra Co-operative Group Limited (10%) (New Zealand owned) and Parmalat Australia Ltd (6%) (Italian owned) (IBISWorld 2012b). Most (66%) dairy products in Australia are sold to supermarkets, while 15% is sold to the food service sector, 10% to food processors and 10% to convenience stores and others (IBISWorld 2012b). The milk price in Australia was regulated until 2000, guaranteeing farmers a premium for supplying milk 365 days a year (Res29 2013). When deregulated, the price to farmers halved overnight (Res29 2013). WA produces 4% of Australian milk production (Dairy Australia 2014b).

5.4.3 Actors in the WA dairy network

Figure 12 shows the actors in the WA dairy network. The traditional supply chain is shown as blue circles, the three levels of government (federal, state and local) as light orange squares, industry representative organisations as dark green hexagons, support organisations as dark orange circles, not-for-profit organisations as pink diamonds and other organisations as light green circles.

As shown in the figure, the WA dairy industry has 170 dairy farmers (DAFWA 2014a), a significant reduction over the last decade. There are four main dairy processors in WA, with three large processors (OrgM, OrgO and OrgP) and one niche processor (OrgN). OrgM is owned by an Australian consortium and was previously owned by OrgZ, a large international dairy company. OrgO is owned by a WA family and OrgP is owned by a large international dairy company. The niche
processor, OrgN, is a small family-owned dairy farm and processing plant that differentiates itself based on quality and ES credentials, such as eco-friendly packaging. Interviewees confirmed that the dairy supply chain is dominated by the large retailers (Res34 2013; Res32 2013; Res30 2013). Res32, from niche processor OrgN, noted: “I take the position that Coles and Woolworths are the market and rather than fight the situation we need to work with it, as they are the customer and they are the conduit to the largest market at our doorstep.”

Figure 12: Actors in the WA dairy network

The dairy industry has regional and national representation. Nationally, the industry is represented by Dairy Australia Limited (Dairy Australia) and the National Farmers’ Federation (NFF). Dairy Australia is funded by the ‘Dairy Services Levy’ (paid by farmers) and government funding. Dairy Australia has a Regional Development Programme (RDP) in each of the eight dairying regions of Australia, including ‘Western Dairy’ in WA. Res6 commented that the dairy industry is regionalised and “that leads to potentially cultural differences as well between those different areas.”
In WA, dairy farmers and the dairy industry are represented by Western Dairy and the WAFF. Western Dairy is the smallest of the eight RDPs and obtains funds from Dairy Australia, Natural Resource Management (NRM) bodies, State Government and other investors (Dairy Australia 2014b). There is a need for a regional approach due to the large number of small dairy farmers and differing climatic conditions (Res29 2013).

The WA dairy industry interacts with government at a national, state and local level. Nationally the dairy industry is supported by the ‘Australian Government Department of Agriculture, Fisheries and Forestry’ (DAFF). At a state level, the WA dairy industry interacts with DAFWA, DoW and DER, among others. Other significant actors include farm consultants and green specialist companies.

Animal welfare issues are not a big issue in the dairy industry. Res34 explained that “the better the farmer treats his cow the more milk he is going to get. So he is not going to do anything to impact … so he is just purely about revenue.” Thus, good animal welfare practices increase economic sustainability.

5.4.4 Interviewees from the WA dairy network

Table 29 provides interviewee and fieldwork details about the people in the dairy industry who were interviewed. Information about other interviewees from the wider agrifood sector were shown in Table 17, while Table 30 provides a list of the organisations that are frequently discussed in Case B.

Table 29: Interviewees specific to the WA dairy network

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Type of organisation</th>
<th>Interviewee details</th>
<th>Interview type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Res29</td>
<td>DAFWA (dairy section)</td>
<td>Manager. Greener Pastures project. Involved with dairy industry for 10 years.</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res30</td>
<td>Dairy Australia</td>
<td>Been with Dairy Australia for 8.5 years.</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Organisation</td>
<td>Type of organisation</td>
<td>Interviewee details</td>
<td>Interview type</td>
</tr>
<tr>
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</tr>
<tr>
<td>Res31 Western Dairy</td>
<td>State industry organisation</td>
<td></td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res32 OrgN Small dairy farmer and processor</td>
<td>Owner, managing director</td>
<td></td>
<td>Presentation and telephone interview</td>
</tr>
<tr>
<td>Res33 OrgM Large dairy processor</td>
<td>Services Supervisor</td>
<td></td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Res34 OrgM Large dairy processor</td>
<td>Former operations manager. Worked at OrgM for 19 years.</td>
<td></td>
<td>Face-to-face</td>
</tr>
</tbody>
</table>

**Table 30: List of organisations relevant to the dairy case study**

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OrgG:</td>
<td>Food service, seafood distributors, ship suppliers. Large, family-owned food distribution company.</td>
</tr>
<tr>
<td>OrgH:</td>
<td>Large international food services and distribution company.</td>
</tr>
<tr>
<td>OrgJ:</td>
<td>Large independent supermarket.</td>
</tr>
<tr>
<td>OrgM:</td>
<td>Large milk processor.</td>
</tr>
<tr>
<td>OrgN:</td>
<td>Small milk farmer and processor.</td>
</tr>
<tr>
<td>OrgO:</td>
<td>Large milk processor.</td>
</tr>
<tr>
<td>OrgP:</td>
<td>Large milk processor.</td>
</tr>
<tr>
<td>OrgQ:</td>
<td>Cleaning chemical supplier to food industry.</td>
</tr>
<tr>
<td>OrgZ:</td>
<td>Large international dairy processor that owned OrgM in the past.</td>
</tr>
<tr>
<td>DAFWA:</td>
<td>Western Australia Department of Agriculture and Food.</td>
</tr>
<tr>
<td>DER (formerly DEC):</td>
<td>Western Australia Department of Environment Regulation.</td>
</tr>
<tr>
<td>WALGA:</td>
<td>Western Australia Local Government Association.</td>
</tr>
<tr>
<td>AAAC:</td>
<td>Australian Association of Agricultural Consultants WA Inc.</td>
</tr>
<tr>
<td>WAFF:</td>
<td>Western Australia Farmers’ Federation.</td>
</tr>
</tbody>
</table>
5.4.5 Events relevant to the spread of ES practices in the WA dairy industry

Table 31 shows events relevant to the processes of spread of ES practices in the WA dairy industry. The events were deemed relevant based on interview data, industry documents, together with the double sense-making process that was used throughout the present study (Halinen et al. 2013). As can be seen in Table 31, a number of the events relating to the WA dairy industry are common to the WA pork industry events that were shown in Table 21. The explanation of these events will not be repeated here. Additional events that were not in Table 21 are shown in bold and are discussed here.
<table>
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<tr>
<th>Year</th>
<th>International level</th>
<th>Australian level</th>
<th>WA state level</th>
<th>WA dairy industry</th>
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<tr>
<td>1</td>
<td>1972</td>
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<td>1) UN conference on the Human Environment in Stockholm.</td>
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<td>1</td>
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<td>(bold indicates events additional to the pork industry events in Table 21)</td>
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<td>2</td>
<td>1986</td>
<td>1) Environmental Protection Act.</td>
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<td>Year</td>
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<td>2)</td>
<td>The UN began a long-term project to make the global economy more sustainable (DEC 2003).</td>
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<tr>
<td>1)</td>
<td>Agenda 21 (a detailed action plan for the 21st century) agreed at the UN Conference on Environment and Development held in Rio de Janeiro, Brazil (DEC 2003).</td>
<td>All Australian state and territory governments agreed to the ‘Intergovernmental Agreement on the Environment’ - to provide for a cooperative national approach to the environment (DEC 2003).</td>
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<td>6 1992</td>
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<td>9 1997</td>
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<td></td>
<td>2) Formation of GRI.</td>
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<td>10</td>
<td>1998</td>
<td>1) NPI NEPM came into effect on 27 Feb.</td>
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</table>
2) National Packaging Covenant. |                |                   |                   |
| 12   | 2000                | 1) **Deregulation of Australian dairy industry.** |                |                   |                   |
2) Local governments reported on how they had implemented ‘Local Agenda 21’ and the ‘Cities for Climate Protection Program.’ | 1) Australian Government issued its first report on the ‘National Headline Indicators for Sustainability’ (DEC 2003). | 1) WA joined the ‘Network of Regional Government for Sustainable Development’ and signed the ‘Gauteng Declaration’ |
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<th>Year</th>
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2) DairySAT. | 1) ‘Farming for the Future’ (FFF) project.  
2) ‘Farming for the Future project’ (dairy industry).  
3) DairyCatch. |
2) ‘Greener Pastures’ project (cont.) |
Start of the first Garnaut Climate Change Review. | 1) ‘Farming for the Future’ project (cont.)  
2) ‘Greener Pastures’ project (cont.) |

3) Regional governments or states form the ‘Network of Regional Government for Sustainable Development’ and twenty-one member governments signed the ‘Gauteng Declaration.’
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<tr>
<th>Year</th>
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<td>19</td>
<td>2008</td>
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<td>20</td>
<td>2009</td>
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<td></td>
<td>1) Global financial crisis (GFC) (cont.). 2) UN Copenhagen Climate Change Conference.</td>
<td>1) Two failed attempts to pass ‘The Carbon Pollution Reduction Scheme Bill 2009.’</td>
<td>1) DAFWA’s ‘Food Industry Development 2009-2012’ document published.</td>
<td>1) ‘Greener Pastures’ project (cont.)</td>
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<td>21</td>
<td>2010</td>
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<td></td>
<td>1) UN Cancun Climate Change Conference.</td>
<td>1) Australian Packaging Covenant. 2) Start of the update of 2008 Garnaut Climate Change Review. 3) The passing of ‘The Carbon Pollution Reduction Scheme Bill 2010’ lapsed at the Senate due to the calling of national elections.</td>
<td></td>
<td>1) ‘Greener Pastures’ project (cont.)</td>
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<td>Year</td>
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2) The Carbon Credits (Carbon Farming Initiative) 2011 (CFI Act) passed by Parliament.  
3) Clean Energy Act.  
6) **Coles reduces retail milk price of house-brand milk to A$2 per 2 litre in Jan 2011** (Wesfarmers Ltd 2011). Woolworths also adopts this practice.  
7) **Senate inquiry launched into the potential impact of A$1 per litre pricing on the Australian dairy industry** (Wesfarmers Ltd 2011). |  |  |
| 23   | 2012                | 1) UN Rio + 20 Earth Summit. | 1) Land sector package which includes the Carbon Farming Futures and ‘Regional Natural Resource Management’ (NRM) Planning for Climate Change Fund commences. | 1) **DAFWA’s Agrifood 2025+ initiative.**  
1) **The ‘Code of Practice for Dairy Shed Effluent Western Australia’ was developed by Dairy Australia, Western Dairy and Industry stakeholders.** |  |
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<th>Year</th>
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<td>2) Amendments to the CFI regulations come into force on 29 May.</td>
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<td>3) Introduction of ‘carbon pricing scheme’ from 1 July (under the Clean Energy Act 2011).</td>
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<td>5) Final report by the Senate Economics Reference Committee.</td>
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<td>6) Australian Government noted the findings of the Australian Competition and Consumer Commission in July 2011 that there was “no evidence that Coles acted in breach of the (Competition and Consumer) Act in relation to milk discounting.”</td>
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<td>24</td>
<td>2013</td>
<td>1) GRI 4 series published.</td>
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<td></td>
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<td>1) Attempt to repeal carbon pricing scheme.</td>
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<td>WA state level</td>
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<td>25</td>
<td>2014</td>
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<td></td>
<td>1) UN Climate Change Conference held from 4 to 15 June in Bonn, Germany, as governments work towards a new agreement in Paris in 2015 (UNFCCC 2014).</td>
<td>1) Attempt to repeal carbon pricing scheme.</td>
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<td>2) UN Summit on Climate Change in New York.</td>
<td>2) April - Australian Government release the white paper on Direct Action Climate Change Plan which includes a A$2.5 billion emissions reduction fund (ERF) which is slated to start 1 July and will pay industries for activities that reduce carbon emissions (ABC news 2014).</td>
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<td>3) July. Carbon pricing scheme repealed.</td>
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<td>26</td>
<td>2015</td>
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<td></td>
<td>1) Planned UN Framework Convention on Climate Change (UNFCCC) in Paris to reach agreement that will take effect from 2020.</td>
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</table>
Table 31 shows events at an international (column B) and Australian (column C) level that reflect an international and national focus on ES issues, as discussed for the pork industry in section 5.2.6.1. The Australian (and WA) dairy industry has been “recognised for its proactive approach to environmental management, an approach that is delivering significant outcomes in terms of on-farm change in environmental practices” (Dairy Australia 2014a, p. 1).

As can be seen in columns C, D and E, there have been a number of joint industry/government projects to improve ES practices. For example, at a national level (column C) the ‘Dairying for Tomorrow’ (DfT) programme has been in place since 2005. The DfT programme includes regional on-farm change programs. Since 2005 over 4,000 (50%) Australian dairy farmers have participated in the DfT programme and 85% of these farmers have made significant changes to management practices (Dairy Australia 2014a). The DfT programme has national tools and frameworks, a key one being DairySAT, which is a “dairy environmental self-assessment tool” (Dairy Australia 2014a). The DairySAT checklist and guide were developed from two years of farmer and industry consultation throughout Australia (DAFWA 2006c).

At a WA state level (columns D and E) there have been many ES projects, such as the FFF project (see section 5.2.6.5), the DairyCatch programme and the Greener Pastures project. DairyCatch is an industry-led project through which farmers develop and implement best management practices for environmentally sustainable dairying (DAFWA 2006b). The preparation of environmental best management practice guidelines has been a key output of the DairyCatch programme (DAFWA 2006a). The ‘Greener Pastures’ project is concerned with the optimal use of nitrogen fertiliser, from both a profitability and an environmental perspective (DAFWA 2011).

The FFF project sought to provide support for existing programmes, such as assisting Western Dairy with on-farm pilots through DairySAT (England & White 2009). Key deliverables from the FFF support of the dairy industry were the development of the DairySAT and DairyCatch guides (England & White 2009). In the FFF project, the WA dairy industry proved to be a model industry, with DAFWA seeing it as “a leader in demonstrating its sustainability”, providing an example to other WA
industries on how to address sustainability (England et al. 2009, p. 128). Western Dairy had extensive national and state support for the development of DairySAT and DairyCatch (England & White 2009). Such support was not received by all industry organisations in the FFF project (England & White 2009).

However, the FFF project showed that, although the industry pilots of DairySAT demonstrated that on-farm change had occurred as a result of the programme, “changes in direction and investment within the industry” resulted in DairySAT not being spread beyond the pilot groups (England & White 2009, pp. 209-210). These changes referred to the change in Australian funding from EMS to carbon emission reduction (Res6 2013), as was discussed in section 5.2.6.5. At the end of the FFF programme it was concluded that “whilst the resulting DairySAT programme was not on-going, the industry met its milestones in demonstrating its sustainability and is well positioned should the market or community drivers for demonstrating sustainability become stronger” (England & White 2009, p. 210).

After the FFF project, Dairy Australia developed the ‘Future Ready Dairy Systems’ (FRDS) programme to provide practical and profitable practices through which dairy farmers could deal with increased climate variability and policies relating to carbon emissions (Dairy Australia 2012). The FRDS programme is the regional delivery component of a larger ‘Climate Change Research Program’ project called ‘Mitigation and Adaptation in the Australian Dairy Industry.’ The FRDS programme has been delivered across the eight Australian dairy regions in collaboration with the Regional Development Programs and state agriculture agencies (Dairy Australia 2012). Thus, while FFF and the related DairySAT and DairyCatch programmes were focused on Environmental Management Systems (EMS), the new direction in research and funding in the dairy industry was concerned with climate change and reducing carbon emissions. This demonstrates the influence the direction of Australian Government funding had on practices and projects.

Interviewees suggested the WA dairy industry has “skinny margins”, which affects the use of additional ES practices (Res34 2013). As an example, the deregulation of the milk price in 2000 led to a significant decrease in the farm-gate price of milk. Another event potentially affecting margins was the decision by Coles (and then Woolworths) in 2011 to use house-brand milk as a loss leader. A subsequent Senate
Enquiry found the practice did not breach the Australian Competition and Consumer Act.

5.4.6 Processes of spread of ES practices in the WA dairy industry

Based on the information in Table 31 and other data, the processes of spread in the WA dairy industry are shown in Table 32. Column B shows the macro-processes of spread identified, while column C provides examples of sub-processes contributing to the macro-processes. The events from Table 31 relating to each macro-process are shown in column D, while column E provides examples of relevant quotes and other evidence. Column F indicates the prevalence of the macro-processes in relation to farmers, processors and retailers (where H indicates high prevalence, M=medium prevalence, L=low prevalence and ‘n/a’ indicates that no data was found linking the process to that organisation type).
<table>
<thead>
<tr>
<th>Macro-processes of spread</th>
<th>Examples of sub-processes of spread</th>
<th>Relevant events from Table 31 / other evidence</th>
<th>Examples of relevant quotes from interviews / other evidence</th>
<th>Prevalence for farmers, processors and retailers</th>
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<tr>
<td>S1</td>
<td>Enacting and enforcing environmental (and other relevant) legislation, regulations and reporting requirements.</td>
<td>1) Enacting and enforcement of the Australian Environment Protection and Biodiversity Conservation Act (EPBC Act) of 1999. 2) Enacting and enforcement of the WA Environmental Protection Act of 1986. 3) The development and enforcement of the National Greenhouse and Energy Reporting Act (NGER Act) of 2007.</td>
<td>D2.1, C7.1, C10.1, C11.1, C12.1, C17.1, C18.1, C19.1, C20.1, C21.3, C22.1, C22.2, C22.3, C22.4, C23.1, C23.2, C23.3, C23.4, C24.1, C25.1, C25.2, C25.3, interviews, supermarket review</td>
<td>1) Res34 of OrgM: “in Australia there is quite a lot of regulations that force people to be ‘green’. But if there was no regulations then I don't think people would do … and it’s all about costs.” 2) Res32 of OrgN: “without any of that regulation it would just be open slather and we would have our … you know waterways polluted and all sorts of things […] So there is a need for regulation.” 3) Res34: “Even at OrgM’s [large milk processor] level there was probably not the desire to do it [ES practices] as much as probably they should have. So it was more about minimum compliance rather than anything else.”</td>
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<td>Macro-processes of spread</td>
<td>Examples of sub-processes of spread</td>
<td>Relevant events from Table 31 / other evidence</td>
<td>Examples of relevant quotes from interviews / other evidence</td>
<td>Prevalence for farmers, processors and retailers</td>
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<td>4) OrgM (large WA dairy processor) receiving assistance from the regulators concerning the National Pollutant Inventory (1995) requirements.</td>
<td>4) Res34: “if your waste isn’t sorted, they [local council] will literally give it back to you and you'll be laying it on the tarmac and sorting out your waste.” 5) Res34: OrgM correctly separates their waste and “it is not driven because of a desire to do anything else but that’s the rules from the waste treatment companies” and it is “more driven for the fact that if you don't follow the rules mate …[...]… you can't operate.” 6) Res34: “if you're not proactive then the rules determine what you can and can't do and then that will force your hand to do what you need to do. So you've got your Pollution Inventory Index that they have got to do, you have got your Packaging Covenant that they've got to do.”</td>
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<td>Macro-processes of spread</td>
<td>Examples of sub-processes of spread</td>
<td>Relevant events from Table 31 / other evidence</td>
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| **S2** | Forming and implementing joint government/industry projects concerning ES issues. | 1) Forming and implementing the national Dairying for Tomorrow programme (since 2005).  
2) Forming and implementing the WA ‘Greener Pastures’ project from 2005-2010.  
3) Forming and implementing ‘The Code of Practice for Dairy Shed Effluent Western Australia’ by Dairy Australia, Western Dairy and industry stakeholders.  
2) Res29 of DAFWA: “Sometimes if you go in with a big stick you know farmers won’t …[J]… react in the way you want them to.”  
3) Res32 of OrgN: DAFWA “don't cause problems. They try to offer opportunities and workshops and show an interest and they are certainly very keen to assist with any export things or avenues that we want to investigate so … and they are very helpful and they are always use opportunities to try and promote us ourselves and that’s nice.” | H H H |
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<th>Macro-processes of spread</th>
<th>Examples of sub-processes of spread</th>
<th>Relevant events from Table 31 / other evidence</th>
<th>Examples of relevant quotes from interviews / other evidence</th>
<th>Prevalence for farmers, processors and retailers</th>
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| S3 Developing and implementing voluntary agreements and reporting requirements. | 1) Forming and implementing ‘The Code of Practice for Dairy Shed Effluent Western Australia’ by Dairy Australia, Western Dairy and industry stakeholders.  

7) National Landcare Programme (since 1989).
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<th>Macro-processes of spread</th>
<th>Examples of sub-processes of spread</th>
<th>Relevant events from Table 31 / other evidence</th>
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<th>Prevalence for farmers, processors and retailers</th>
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<td>3) Development and implementation of Australian Packaging Covenant of 2010 (formerly National Packaging Covenant). 4) Coles and Woolworths producing comprehensive sustainability reports. 5) Coles and Woolworths being assured and rated according to GRI 3 series.</td>
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<td>Macro-processes of spread</td>
<td>Examples of sub-processes of spread</td>
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<td>S4 Spread through consumers demanding ES practices.</td>
<td>1) Australian consumers expecting a high ‘clean and green’ standard from Australian companies. 2) Spread through Coles and Woolworths educating consumers about ES issues such as the use of plastic shopping bags. 3) The education of consumers through government programmes such as the Australian Landcare programme. 4) Education of consumers by environmental organisations such as the WWF.</td>
<td>C4.1, B16.1, interviews, supermarket review</td>
<td>1) Res31 of Western Dairy: “I think the consumer largely thinks that dairy farmers generally are quite good land managers I mean there is spots like for instance in the Geo, in the Geographe catchment where there have been fish killed in the Geographe bay, there is a bit of community blame laid at the foot of dairy farms there, but that’s I guess a hotspot and difficult to also quantify that it was actually the dairy farms to blame. But generally on a broader scale, I think the market research would suggest that the consumers largely believe dairy farmers to be good land managers. Their visions are you know the grass is always green and the cows are always happy.” Please refer to Table 20 S4 for further relevant quotes.</td>
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| S5 | **Spread through actors wanting to ‘do the right thing.’** | 1) OrgN pursuing green practices because it is the ‘right thing to do.’
2) UN implementing a focus on the ‘Era of Sustainability’ in 1987.
3) Australia implementing the ‘Decade of Landcare’ programme in 1989. | Interviews, supermarket review | 1) Res32 of OrgN: “it’s not about doing it [ES] because you can advertise it or you can have a cosmetic marketing advantage ... [...] It’s about doing it because it's right.”
2) Res32: “in the last 10 years there have been a lot of focus on claims for ‘clean green’, all this sort of thing, and some of it is marketing effort and that really frustrates me because you know you hear of companies that have achieved green standards and it’s just because they have a pile of trees in Kathmandu or something that they are offsetting.” | L | L | L |
<p>| S6 | <strong>Green supply chain management.</strong> | 1) Coles and Woolworths assisting suppliers in foreign countries to adhere to Ethical sourcing policies and green purchasing criteria. | Interviews, supermarket review | 1) Res34 of OrgM: “They [Coles and Woolworths] do audits but I don’t think they … [...] as long as you are not adversely doing things then they don’t really … they are not really big on it [ES credentials].” | L | L | M |</p>
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<td>2) Res34: “shelf-ready [packaging] is the absolute opposite of ‘green’ ...[]... which actually destroyed our [OrgM’s] Packaging Covenant, what we needed to do but what we could achieve.”</td>
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<td>3) Res32 of OrgN: “Coles WA management team have gone out of their way to find opportunities to promote our range with contributions which we as a small business are unable to make - such as in-store tastings.”</td>
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<td>S7 Spread through intermediaries.</td>
<td>1) Spread by assurance companies making recommendations to e.g. Coles and Woolworths. 2) Spread by Dairy Australia using leading farm consultants to roll out ES projects.</td>
<td>Interviews, supermarket review</td>
<td>1) Res30 of Dairy Australia: “we use our leading farm consultants as much as possible. When we [Dairy Australia] deliver a programme we try to get the influential consultants to deliver it for us.”</td>
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<td>Macro-processes of spread</td>
<td>Examples of sub-processes of spread</td>
<td>Relevant events from Table 31 / other evidence</td>
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<td>2) Res30: farm consultants “are the ones that will cut through …[… so it's really about engaging them to roll out your programmes, particularly in climate change adaptation, it might be a production-type topic …[… if you don't work with the gatekeepers, you are wasting your time.”</td>
<td>3) Res30: “when we were piloting that [programme] we targeted the consultants and asked them to bring along two or three of their farmers …[… the farmers are increasingly using the consultants to make their decisions, so we are really targeting the consultants but also bringing some farmers along so that the consultant was comfortable that the farmers were appreciating the process as well. So as we roll that out, there would be no point in us rolling it out to just the farmer, he has to have his consultant there as well.”</td>
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<th>Macro-processes of spread</th>
<th>Examples of sub-processes of spread</th>
<th>Relevant events from Table 31 / other evidence</th>
<th>Examples of relevant quotes from interviews / other evidence</th>
<th>Prevalence for farmers, processors and retailers</th>
</tr>
</thead>
</table>
| S8 Spread by organisations choosing to pursue green marketing. | 1) OrgN pursuing high quality and environmentally friendly dairy products targeting a niche market.  
2) Coles and Woolworths marketing themselves as environmentally friendly in their sustainability reports and websites.  
3) OrgN’s pursuit of sustainability awards.  
4) Coles and Woolworths pursuit of sustainability awards. | Interviews, supermarket review | 1) Res32: “there’s a lot of inconsistency [in the consumers behaviour] and until the consumer is sort of … is definite about what they want or have the desire to really genuinely be green, not the extreme consumer but the average consumer, Coles probably won't find that [green] a key marketing angle.” | L L M |
<p>| S9 Spread due to international influence and global committees. | 1) Spread by DAFWA considering nitrogen use in other countries leading to the Greener Pastures project (Res29). | B1.1, B3.1, B3.2, B3.3, B5.1, B5.2, B6.1, C6.1, B8.1, B9.1, B9.2, B14.1, B14.2, B14.3, D14.1, B16.1, B20.1, B21.1, B23.1, B24.1, B25.1, B25.2, B26.1, interviews, supermarket review | 1) Res29 of DAFWA: the Greener Pastures project emerged when “they were already seeing you know in places like Europe and certainly New Zealand that the use of nitrogen fertiliser was starting to be regulated because you know it'd been a big polluter basically.” | H H H |</p>
<table>
<thead>
<tr>
<th>Macro-processes of spread</th>
<th>Examples of sub-processes of spread</th>
<th>Relevant events from Table 31 / other evidence</th>
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<th>Prevalence for farmers, processors and retailers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2) Spread by representatives of Dairy Australia attending international conferences and bringing back the international best practices to Australia.</td>
<td>2) Res30 of Dairy Australia: “I’ve interacted with what they call ‘Sustainable Agriculture Initiative’ or SAI Platform which was really put together by a whole lot of food companies …[…]… I also look at the individual … what the individual countries are doing, like the UK Roadmaps, I go over to New Zealand and increasingly will try and work with them and what they are doing around environmental issues, you also learn what you don't want to have in way of regulation, because regulation can be very blunt.”</td>
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<td>3) Spread through global interest in the environment (such as UN conferences) which influences Australia to take part in global initiatives concerning ES issues.</td>
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<td>4) Spread though international voluntary agreements such as Kyoto Protocol (relates to process S3) which Australia chooses to participate in.</td>
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<td>Macro-processes of spread</td>
<td>Examples of sub-processes of spread</td>
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<td></td>
<td>5) Spread through international projects to develop environmental standards such as GRI and ISO 14001.</td>
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</table>
| S10 Spread through pursuit of economic sustainability. | 1) Farmers (such as OrgN) implementing ES practices because they are sound business practices i.e. increase productivity or reduce costs.  
2) OrgN pursuing a high ES and high quality niche market after the drop in the milk price following deregulation in 2000 to try to ensure economic sustainability.  
3) Processors (such as OrgM) implementing ES practices which save costs. | C12.1, B19.1, B20.1, C22.6, C22.7, C23.5, C23.6, interviews, supermarket review | 1) Res32: After drop of milk price following deregulation in 2000 the owners of OrgN “began looking for options to create a sustainable future for our family in dairy farming.”  
2) Res34: “So some of those things like energy-savings or whatever you can do … effluent savings… whatever you can do to save money to reduce your costs.” | H H H |
<table>
<thead>
<tr>
<th>Macro-processes of spread</th>
<th>Examples of sub-processes of spread</th>
<th>Relevant events from Table 31 / other evidence</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4) Coles and Woolworths implementing intra-organisation practices which reduce costs, such as more efficient refrigeration systems.</td>
<td>3) Res29 of DAFWA: “As we've decreased in farm numbers [in WA] most of the farmers that are there look to be here for the long-term so they therefore by default take a very long-term view of their farming practices and they are well aware that because of the intensity of farming you know one of the things that we do need to be aware of and address is just you know all the potential environmental footprint aspects.”</td>
<td>4) Res30 of Dairy Australia: “I think what we know about climate change adaptation is that it's really about doing your business well …[…]… getting back to the basics.”</td>
<td>5) Res32: “we are not doing it [ES practices] because they [the DER] told us to, we are doing it because that's how we would do it anyway.”</td>
</tr>
<tr>
<td>Macro-processes of spread</td>
<td>Examples of sub-processes of spread</td>
<td>Relevant events from Table 31 / other evidence</td>
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<td>6) Res32 of OrgN: “I think like with farming we have always had to be responsible for our own waste anyway and so we … what we just naturally did was right. So we set up setting ponds [to deal with dairy effluent] because we have to look after our own ground because it's ours forever sort of thing.”</td>
<td></td>
</tr>
</tbody>
</table>
| S11 Imitating             | 1) OrgN imitating a Swedish company’s eco-packaging and their continuous improvement approach to sustainability.  
2) Coles and Woolworths imitating ES practices to avoid giving the other company a ‘point of difference.’  
3) Woolworths positioning itself as a global leader in sustainability performance and reporting, which other companies imitate. | Interviews, supermarket review | 1) Res32 of OrgN: the Swedish company (whose packaging OrgN uses) always “strive for excellence and I suppose if we can do it better that's what we wanted to do. So it had a big influence on how we make our decisions.”  
Please see Table 22 S12 for more relevant quotes concerning the large Australian supermarkets. | L L H |
5.4.6.1 Enacting and enforcing environmental (and other relevant) legislation, regulations and reporting requirements

All of the interviewees indicated the importance of this process of spread; hence prevalence is denoted as ‘high’ in Table 32. Res34 argued that, in the absence of regulations, ES practices would not be implemented unless the shareholders had a green marketing focus or ES practices reduced costs. The supermarket review also showed Coles and Woolworths were impacted by this process of spread. The Australian and WA dairy industry have been proactive in developing industry-specific guidelines to help farmers comply with Australian and state legislation, which assists spread.

The DER plays an important role in this process and can shut down or prosecute organisations for non-compliance, such as the prosecution of a milk processor for the pollution of a waterway with unprocessed milk (DER 2014). Another instance where the regulators (DER) intervened to ensure compliance was when OrgM had an effluent plant shut down because of odour (Res34 2013). The regulators not only act as “the stick” (enforcing ES practices) but also provide assistance. For example, OrgM has to comply with the National Pollutant Inventory (NPI) reporting. Res33 explained NPI assessors visited their site and provided advice as to what OrgM needed to do and added the “government is actually running a course to fill out the actual paperwork for it;” assisting companies to comply with regulations.

5.4.6.2 Forming and implementing joint government/industry projects concerning ES issues

Table 32 shows the numerous joint ES projects undertaken at a national and state level. The dairy industry has been very active in the joint government/industry projects; hence the ‘high’ prevalence of this process indicated in Table 32. Since the WA (and Australian) dairy industry includes a large number of small farmers, the structure of the Australian industry representative body (Dairy Australia) is regionalised, which interviewees indicated assisted spread by designing projects relevant to the regions’ terrain and culture (Res6 2013; Res29 2013).

Res29, who worked on the Greener Pastures project, believed that the spread of ES practices came through promoting the productivity and economic benefits of such practices to farmers, rather than their ES aspects. Res29 felt this technique had led to
the greater success of the Greener Pastures project in WA than in the Eastern States, where environmental aspects were emphasised. The WA project team showed farmers “it was a win-win situation both for their productivity and profitability but also to protect you know the environment” (Res29 2013).

Res30 from Dairy Australia suggested a variety of delivery methods were used in the projects, such as demonstration farms, participatory and reactionary research, bottom-up (rather than top-down) methods, working cooperatively with innovative farmers, providing professional development opportunities to enable farmers to share ideas and the use of social media (e.g. YouTube). These delivery methods were cooperative, rather than coercive, which was also the approach favoured by DAFWA (Res29 2013). Res32, from niche dairy processor OrgN, commented: “DAFWA are really supportive. They are a really good resource for us. If we have … they can't always help, but they want to help.”

5.4.6.3 Developing and implementing voluntary agreements and reporting requirements

Voluntary agreements and reporting were common; hence ‘high’ prevalence in Table 32. Voluntary agreements have been made at an international level (the UN Montreal Protocol on Substances that Deplete the Ozone Layer in 1987), a national level (Australia’s ‘Intergovernmental Agreement on the Environment’ in 1992) and a WA dairy industry level (‘The Code of Practice for Dairy Shed Effluent Western Australia’ in 2012). Voluntary reporting includes reporting by processors (such as OrgM) and retailers (e.g. Coles and Woolworths) through the Australian Packaging Covenant and in their comprehensive sustainability reports. Since all organisational types were influenced by voluntary agreements and reporting requirements, a ‘high’ level of prevalence was included in Table 32.

5.4.6.4 Spread through consumers demanding ES practices

Interviewees indicated that milk is regarded as a commodity and that the average consumer buys based on price and does not demand and is not willing to pay a premium for ES credentials (Res34 2013). However, consumers expect the Australian dairy industry to use appropriate ES practices (Res31 2013). Most dairy products are not marketed according to ES criteria, with the exception of OrgN’s
high quality and ES brand that services a niche, high-end consumer market (Res34 2013). The supermarket review showed retailers educated consumers about some ES aspects, such as the use of single use plastic bags, which is part of this process of spread. There was a ‘low’ prevalence of this process for farmers and processors and ‘medium’ prevalence for retailers, as is shown in Table 32.

5.4.6.5 Spread through actors wanting to ‘do the right thing’

Res32 suggested OrgN has pursued a high quality, high ES product due to personal ethics. However, most interviewees did not emphasise this process; hence the allocation of low prevalence in Table 32.

5.4.6.6 Green supply chain management

Green supply chain management is not a focus for the major retailers. As previously mentioned, Coles and Woolworths have ethical sourcing criteria, which is most common in their relationships with non-Australian suppliers of house-brand products. The dairy industry interviewees also suggested Coles and Woolworths had considerable power over the agrifood sector. Res34 commented that the retailers “have got all the power” in the WA dairy industry. However, they have not wielded their full power in the dairy supply chain to ensure increased ES practices (Res34 2013). Res34 from OrgM suggested some demands from retailers, such as for shelf-ready packaging, have had a negative effect on their ES practices. There is also a lack of green SCM at other tiers in the supply chain. For example, as OrgM is not getting pressure from Coles and Woolworths for ES accredited products they, in turn, are not putting pressure on their farm suppliers (Res34 2013).

OrgN considered their relationship with Coles to be good and that Coles has assisted them in their development. Coles approached the niche dairy processor and recognised that there was a niche market for the high quality and ‘green’ products. Coles has also lauded OrgN as a WA success story on their website. So, although Coles’ marketing focus is not on ES, it recognises a niche market for quality milk with ES attributes and actively promotes OrgN and its products.

Res30 from Dairy Australia believed Coles and Woolworths were supportive and encouraged good environmental management systems, but do not require them,
although some suppliers were rewarded for ES initiatives by being given supply contracts. However, ES credentials were unlikely to be the only purchasing criteria used. Res30 also agreed Coles and Woolworths did not use ES credentials as a marketing edge, although they used animal welfare aspects in this way. Hence the process was regarded as ‘low’ prevalence for farmers and processors and ‘medium’ for retailers.

5.4.6.7 Spread through intermediaries

Interviewees noted the key role played by farm consultants in the spread of ES practices; hence the ‘high’ prevalence of this process for farmers in Table 32. The government and industry projects often used farm consultants to deliver ES projects due to the large number of small farmers. A further example of the process of spread through intermediaries was the spread occurring when assurance companies provide recommendations during the process of assurance (e.g. on Coles and Woolworths sustainability reports). Hence the ‘medium’ level of prevalence of the process assigned to retailers. The processors did not highlight this process which meant a low prevalence level was assigned.

5.4.6.8 Spread by organisations choosing to pursue green marketing

Green marketing was not used very much in the dairy industry. Res32 thought a possible explanation for Coles and Woolworths not having a strong green marketing focus and not using their full supply chain power to bring about green practices in suppliers was because “all of their products right throughout their store rely so heavily on packaging for presentation and marketing appeal and all of that and they would just be opening Pandora's box if they tried to make it a completely ‘green’ focus” (Res32 2013).

OrgN has successfully incorporated environmental sustainability criteria into their marketing. They command a premium for their products and have become economically sustainable. However, the three large processors do not use ES credentials in their marketing. Coles and Woolworths discuss many intra-organisation ES practices in their sustainability reports and promote themselves as environmentally friendly companies, but do not market products based on green credentials, as they do with animal welfare and consumer health. Hence, the farmers
and processors were allocated low prevalence and retailers medium prevalence for this process.

5.4.6.9 Spread due to international influence and global committees

Interviewees suggested dairy industry representative organisations and government departments were aware of international best environmental practices (Res29 2013; Res30 2013). Managers from dairy industry representative organisations interact with the ‘Sustainable Agriculture Initiative’ or SAI Platform, the International Dairy Foundation, the UK, New Zealand, Europe, the Leaf programme in Europe and the UK (Res30 2013). OrgM looked internationally at other dairy companies when designing packaging (Res34 2013) and when working on their Australian Packaging Covenant responsibilities. OrgN conducted global research when looking for suitable eco-friendly packaging and were influenced by a Swedish company from which they sourced their eco-packaging (Res32 2013). The impact of UN, ISO and GRI committees also filtered down to the environment in which the WA dairy industry operates. Woolworths participates in global committees examining ES issues. All organisation types were influenced by this process and hence the prevalence is indicated as ‘high’ in Table 32.

5.4.6.10 Spread through pursuit of economic sustainability

There was a clear dominance of economic sustainability over environmental sustainability (Res34 2013; Res29 2013; Res30 2013; Res33 2013). Res34 noted “skinny margins” in the dairy industry and that it was only if ES practices reduced costs that they were likely to be implemented. Some ES practices are used as they are good for productivity (Res29 2013). Res32 argued many ES practices are simply good long-term farming practices and OrgN would use them even if they were not legislated. As ES practices that increased economic sustainability in the short-term were used, prevalence was shown as ‘high’ in Table 32.

5.4.6.11 Imitating

When Res32 began global research to find the best packaging system for OrgN, she found a Swedish company “which looked like it had the right principles” (Res32 2013). The Swedish company met with OrgN and Res32 noted: “I guess my interest
in trying to improve the way we do things has been significantly influenced by the Swedish because we have had service engineers and company representatives and quite a lot to do with them. We have been over and visited them.” However, most farmers did not indicate prevalence of this process; hence the ‘low’ level assigned to farmers in Table 32.

When asked whether OrgM (large dairy processor) was likely to imitate OrgN’s eco-packaging, Res34 commented that most consumers buy milk based on price and, thus, OrgM was unlikely to imitate OrgN’s ES practices. Hence the low level of prevalence for this practice assigned for processors. Interviewees suggested Coles and Woolworths were very aware of each other’s ES practices and imitated in order to avoid giving the other “a point of difference” (Res21 2012); hence the level of prevalence is ‘high’ in Table 32.

5.4.7 Composition of processes

Case B showed that the process of spread of ES practices in the WA dairy industry was made up of multiple, interacting macro-processes, as summarised in Table 32. As illustrated in section 5.2.8, each of the macro-processes arose from multiple sub-processes, which in turn arose from other multiple sub-processes, in an iterative process. Examples of the sub-processes are shown in column C of Table 32.

5.4.8 Interactions between the processes

The processes of spread in Table 32 occur in parallel (simultaneously) and in series (in sequence) over time. The case study data showed multiple processes occur simultaneously and that, often, a single process in isolation did not bring about spread, whereas more spread occurred due to interactions between processes. For example, enacting and enforcing environmental legislation, in combination with the development of industry-specific guidelines on how to implement the legislation, together with farm consultants, spread ES practices successfully.

5.4.9 Multiple levels

Table 31 and Table 32 show events and processes of spread occurred at various levels, such as the international, national, WA, dairy industry, supply chain and
organisational levels. Please refer to section 5.2.10 for further discussion of these levels.

5.4.10 Summary of processes of spread of ES practices in the WA dairy industry

The key process of spread of ES practices was a slow steady momentum of spread arising from decades of enforced environmental legislation. The large number of small farmers in the WA dairy industry increased the importance of the role of farm consultants. The dispersed farmer structure also meant industry representative organisations, such as Dairy Australia, have regionalised to assist the spread of practices to the many small actors. Eleven macro-processes of spread were identified, each arising from further sub-processes. Green supply chain management is notably low in prevalence, especially in relation to Australian suppliers.

5.4.11 Factors influencing the spread of ES practices in the WA dairy industry

5.4.11.1 Factors promoting the spread of ES practices in the WA dairy industry

Table 33 shows the factors promoting spread that emerged from the data, together with examples of relevant interview quotes.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Quotes from interviews / other evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Enabling international, Australian, WA, industry and organisational aspects</td>
<td>1) Western Dairy had extensive national and state support for the development of DairySAT and DairyCatch (England &amp; White 2009).</td>
</tr>
</tbody>
</table>
| 2 Embeddedness | 1) Res6: “Dairy would be different in that there are lots of smaller players.”  
2) Res6: “if you look at the dairy farmers, in terms of trying to get that information through that supply chain, they tend to be a lot more regionalised.” |
Enabling international, Australian, WA, industry and organisational aspects

International, national, state and industry aspects provided an enabling and supportive environment for the development and spread of ES practices. An example is the availability of funding for ES projects and research by Australian and state governments. A further example is Australian consumers’ expectation of ethical practices from Australian companies (even though they do not appear willing to pay a premium) and a ‘first world’ environment that promotes the spread of ES practices. Company specific factors, such as economic sustainability, proximity to the end consumer and the type of product produced, influence the adoption of ES practices. For example, due to their large size and proximity to the consumers, retailers engaged more in sustainability reporting than dairy farmers, who were typically small and removed from the end consumer.

Embeddedness

Although there are many, small, geographically dispersed dairy farmers, the regionalised dairy industry organisation structure helped communication and interactions between farmers. Further, the active role played by farm consultants and their use by industry representative organisations, such as Dairy Australia and Western Dairy, promoted such interactions. There are only four main dairy processors in WA, which facilitated interactions between them. The processors have relationships and interactions with the farmers who supply them. Coles and Woolworths have power in the dairy industry (Res34 2013), as shown in their use of milk as a loss leader in 2011. These relationships provide an enabling environment for ES practice spread.

5.4.11.2 Barriers to the spread of ES practices in the WA dairy industry

The data from Case B indicates the following barriers to spread of ES practices, which are summarised in Table 34. Subsequent sections provide more details about these barriers.
Table 34: Barriers to the spread of ES practices in the WA dairy industry

<table>
<thead>
<tr>
<th>Factor</th>
<th>Examples of relevant interview quotes</th>
</tr>
</thead>
</table>
| 1 Cost and lack of economic sustainability       | 1) Res34: “skinny margins” in the WA dairy industry.  
2) Res29 of DAFWA: “the majority of farmers do want to be ‘green’ but first and foremost…they've got to have the farmers to afford to be green.”  
3) Res29: “if you try to engage farmers or anybody to be environmentally aware…if they are not making sufficient profits from their business and what you are asking them to do further reduces their margin then it's virtually impossible for them even if they want to…to follow that practice.”  
4) Res31 of Western Dairy: “with regards to dairy, and indeed I think all sorts of Ag that I am in touch with in Western Australia and nationally, you’ve got to be in black to be green…the eye has been on survival in many cases rather than being best practice environmental managers.”  
5) Res34 : ES practices “kind of falls in that pot where you do what you need to do, and you do what you need to do to lower your costs to make sure that you can continue to operate, rather than see it as a platform, because the consumer out there buys on price.” |
<p>| 2 Lack of consumers’ willingness to pay for ES attributes | 1) Res34 explained that “the thing with the dairy game - one of the primary things is that most of dairy is a commodity - it's not a value-add product - so people will buy on price.” |
| 3 Multiple and competing business objectives      | 1) Res34: “there are so many rules and regulations about everything that you have got to do right? You are a food production company so your main focus is really trying to get food out the door…and then that it’s safe [to eat]. So the first thing is that you are getting food out the door a) so all the Health Department rules, all the Australian quarantine inspection rules for your site to be able to manufacture, all of the safety rules around your site, all of the dangerous goods - because you are using a lot of chemicals to clean your plant, and then all your environmental rules. So you are spread so thin as to figure out…the rules and regulations that you have to follow.” |</p>
<table>
<thead>
<tr>
<th>Factor</th>
<th>Examples of relevant interview quotes</th>
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<tbody>
<tr>
<td>2)</td>
<td>Res32 views the competing clean, ES, animal welfare etc. needs as follows: “It is a bit of a balancing act …[...] we can clearly say that first comes our people and our cows…then secondly our product because if we don't do a good product you know then we are wasting our time…[...] and then mixed intertwined with all that is a ‘green’ but I say more…I choose the word ‘ethical’ and it's about making an ethical decision.”</td>
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<tr>
<td>3)</td>
<td>Res34 highlighted the importance of food safety: “if you have a food safety incident you will lose your company overnight… It is hyper-important…so when OrgM was the biggest dairy company at one time and you were feeding - you were 50% of the market - so every day if there is 2 million people in the State, at least 1 million people are having your product every day. If you have a problem on one day with 1 million people - you don't have a business tomorrow. Right? Your business shuts down. So if you don't have food safety you don't have a business; end of story.”</td>
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<tr>
<td>4</td>
<td>Lack of integration and ‘big picture’ thinking</td>
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<td>5</td>
<td>Lack of succession planning for ES</td>
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<tr>
<td>6</td>
<td>Delaying ES expenditure</td>
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</table>
## Cost and lack of economic sustainability

Case B suggested economic sustainability overrides environmental sustainability, which hinders spread of ES practices that do not have a net economic benefit. Government economic assistance (such as grants) improves the net economic benefit and, hence, encourages adoption. The dairy industry has been impacted by economic shocks, such as the deregulation of the milk price in 2000 which decreased the farm-gate milk price. A further economic shock was the use of milk as a loss leader first by Coles and then by Woolworths, contributing to the “skinny margins” in the dairy industry (Res34 2013) that act as a barrier to the spread of ES practices.

## Lack of consumer demand and willingness to pay a premium for ES attributes

Interviewees and the FFF project suggested Australian consumers are not willing to pay for ES credentials, which hinders the spread of ES practices. Res32 has experienced inconsistency in consumer purchasing behaviour: “The consumer wants...
to support ‘local’, wants to support ‘environmentally friendly’, wants to support ‘quality’, to an extent. And then, at the end of the day, most of them buy on price.” Thus, while OrgN’s market is high-end niche consumers, OrgM’s website does not market products based on ES credentials, but rather that they are from WA (i.e. local).

*Multiple and competing business objectives*

Another barrier to the spread of ES practices was the multiple business aspects agrifood companies need to address, such as stringent food safety standards, operational health and safety requirements and environmental legislation. Given these competing pressures, Res34 of OrgM suggested environmental issues rank low on this list. The agrifood sector has to compete against other countries without such high standards, which may put them at a cost disadvantage, exacerbated by high Australian labour costs and a high Australian dollar. The sector typically has low margins, which means they are vulnerable to adverse weather conditions and changes in the global costs of inputs (Res31 2013). While interviewees felt all businesses would like to ‘do the right thing’ with respect to the environment, the extent of their ES practices was seen as often being dictated by their financial situation and competing needs for their resources. Table 35 summarises the agrifood organisations’ objectives that emerged from the analysis, showing the low ranking of ES issues.

**Table 35: Agrifood organisations’ objectives**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Objective</th>
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<tbody>
<tr>
<td>1</td>
<td>Financial viability.</td>
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<tr>
<td>2</td>
<td>Operational viability i.e. compliant with rules and regulations to stay in business. This includes compliance with all relevant legislation e.g. food quality and safety, occupational health and safety, environmental compliance, and hazardous substances compliance.</td>
</tr>
<tr>
<td>3</td>
<td>Additional (voluntary) food safety practices.</td>
</tr>
<tr>
<td>4</td>
<td>Additional (voluntary) occupational health and safety practices.</td>
</tr>
<tr>
<td>5</td>
<td>Additional (voluntary) animal welfare practices.</td>
</tr>
<tr>
<td>6</td>
<td>Additional (voluntary) environmental practices.</td>
</tr>
</tbody>
</table>
Table 35 suggests agrifood organisations’ main concern is to be economically viable. To achieve this they have to comply with a number of regulations and legislations, or they may be closed down by regulators. Food safety was said to be their first priority, followed by occupational health and safety. Thereafter their voluntary practices prioritised improving food safety and occupational health and safety, followed by voluntary animal welfare and environmental practices.

**Lack of integration and ‘big picture’ thinking**

Please refer to section 5.2.12.2 for discussion of this barrier.

**Lack of succession planning for ES**

Another barrier to spread highlighted in the interviews was a lack of succession planning for ES. Res34 explained that it is necessary to maintain good environmental records (for the National Pollutant Inventory reporting, Australian Packaging Covenant and DER reports), but this was often not done and information was lost when employees left. For example, OrgM once had a dedicated environmental compliance officer, but environmental tasks became part of another employee’s job to save costs (Res34 2013). Res34 did not find the same succession planning issues for other aspects, such as food safety. This again points to ES issues being lower on the priority list.

**Delaying ES expenditure**

A further barrier to the spread of ES practices was that some ES practices can be avoided or postponed to cut short-term costs (Res34 2013). However, Res34 suggested such postponements can cause larger costs in the long-term, such as when you wish to sell a business, as was experienced by OrgM. Res34 explained that if there are issues with contamination on site, land cannot be sold. He described how OrgM had an effluent leak many years ago that was not identified as they did not take water samples every 12 months (as regulated) to check water moving on and off site. This practice was avoided to save water testing costs of between A$60,000 and A$90,000 annually. The leak resulted in a waste water pipe break and waste going into the groundwater. OrgZ bought OrgM without knowing about this problem. When OrgZ tried to sell OrgM, the regulators said OrgM was on a contaminated site.
and that they needed to do water sampling and rectify the environmental problems before they could sell the land, resulting in a multi-million dollar cost.

**Different rules in different countries**

A further barrier to spread was the different rules in different countries. Res34 used the apt term ‘carbon leakage’, referring to the situation in which consumers may purchase goods and services in countries that have lower environmental (and other) standards, since it is often a cheaper option. He explained that, if you buy from an Australian company, it has to comply with many standards, but if you buy from China or Thailand the same standards do not apply. The practice of moving production to or supporting production in countries with less onerous sustainability requirements results in global green practices being reduced.

**ES practices associated with public goods and ‘tragedy of the commons’**

Interviewees suggested many ES practices were related to public goods and, hence, private companies were loath to absorb the costs of such practices that benefit others (sometimes competitors). For example, it is cheaper for dairy farmers to avoid treating shed effluent. The costs farmers bear to treat the effluent do not benefit them, but do advantage the environment.

**Unfavourable international, Australian, WA, industry and organisational aspects**

Barriers can arise at many levels. A lack of global consensus about ES issues and changes in Australian ES policies can hinder spread, as can the “skinny” margins in the WA dairy industry. The structure of the WA dairy industry, which has many small farmers also inherently hinders spread, as many actors need to come together to make industry decisions. However, this is mitigated through regionalised industry representative structures etc.

**5.5 Case A1 and Case B: Trends in spread over time**

Most interviewees felt there had been an increasing focus on ES practices by companies and consumers over time. Consumers are more aware of ES issues: “the concern has always been there, but it's becoming more high-profile now” (Res24 2012). Res7 from the DER felt community expectations about ES issues in WA were increasing, while Res16 from OrgH described “a steady increase” of awareness of ES
in the WA agrifood sector. The increasing awareness is reflected in Res15 of OrgG’s comment that: “there's a growing momentum of awareness and we have to be proactive.” This increase in the prevalence and focus on ES practices by organisations is also seen in the supermarket review, in which significant improvements in intra- and inter-organisation ES practices were reported over time.

The various processes of spread identified in the case studies showed trends. For example, there has been an increasing amount of environmental legislation and reporting requirements over time. However, joint government/industry projects focusing on environmental management systems (EMS) and green certification peaked in the early 2000s, with the FFF project. Since the FFF project did not meet all of its goals, DAFWA appears reluctant to engage further in EMS and current WA agrifood projects and strategies, such as Agrifood 2025+, do not focus on EMS or ES certification. Indeed, DAFWA interviewees suggested focusing projects on ES “has been tested” (Res2 2012) in projects such as FFF. Currently Australia and the world are gearing up for the UN 2015 Paris conference and, with many projects at the national and state level concerned about carbon emission reduction, ES issues are still in focus at international, Australian, WA and agrifood levels.

5.6 Do ES practices with different characteristics spread differently?

5.6.1 Legislated versus voluntary practices

The key differentiating characteristic influencing spread found in the data was a distinction between legislated and voluntary ES practices, with the former spreading more readily than the latter. Many interviewees admitted that if certain ES practices were not legislated, their organisations would not implement them (Res34 2013; Res28 2012). This is especially true of ES practices that do not have a short- to medium-term tangible financial benefit. As ES legislation, regulations and reporting requirements are increasing, more ES practices are required for compliance. Pending legislation also brings about changes in processes in readiness for such legislation (e.g. Woolworths discussed preparation for carbon pricing schemes in their SRs).
5.6.2 Short-term versus long-term (or no) economic benefits

The second most prevalent distinction was between ES practices that result in a tangible short- to medium-term economic benefit, and those that do not. At times, government assistance has made an ES practice economically beneficial and has, thus, led to its adoption (such as the Australian grant OrgA received to move from a high temperature to a low temperature system at its rendering plant). The findings suggest the “skinny margins” in the dairy industry meant ES practices that reduce costs or improve productivity spread more readily than ES practices with no or long-term benefits (Res34 2013). The difficulty in attracting a premium price for ‘environmental’ attributes contributed to a higher net economic cost of implementing certain ES practices. However, some ES practices are sound business practices from an efficiency and productivity perspective, such as some farming practices and cost savings on reduced packaging, and are implemented. The interviews and the supermarket review suggested companies voluntarily implement ES practices that have economic and environmental benefits.

5.6.3 Preventative, appraisal, internal failure and external failure practices

The analysis suggested most legislated ES practices are preventative. Many standard business practices, such as sound farming practices, which have economic and environmental benefits, can also be described as preventative. The joint government and industry projects are also concerned with prevention and appraisal, while statutory and voluntary reporting requirements are appraisal practices. When ES preventative practices are postponed, significant internal failure practices may be needed to rectify a situation, such as when OrgM was being sold and remediation of a contaminated site was required at significant cost. Instances of external failure practices were illustrated when OrgM had to sort out an odour pollution problem affecting their neighbours. These practices were addressed by enforcement. Internal and external failure tended to occur in more reactive spread processes.

5.6.4 Strategic versus reactive

Strategic practices tend to be spread by legislation, joint industry/government projects and reporting requirements. Reactive practices tend to be spread through consumers’ demands. Organisation-specific characteristics influence the choice of
strategic versus reactive ES practices, as seen by OrgN using strategic ES practices and OrgM using reactive practices. For example, Res34 suggested the avoidance or postponement of ES practices can result in significant costs later. When “somebody tells you I won't take your effluent…Then you will do something. I won't…do the water samples until I want to sell the company and then I realise I have got to have all this information that I can't sell it until I remediate the site, or you annoy your neighbours and you've got to do something. So it's more reactionary I would say than it is proactive.” Res34 felt OrgM’s approach to ES practices was reactionary rather than proactive and that ES practices were often postponed and avoided where possible.

5.6.5 Independent versus cooperative

Since intra-organisation practices are more prevalent than inter-organisation practices (such as SCM), it appears practices that can be independently adopted by an organisation spread more than those requiring cooperation between organisations. However, the sow stall spread is an example of cooperative practices spread by SCM and the media.

5.6.6 Easy versus complex

Many interviewees spoke of doing the easy (and cheap) ES practices first (e.g. saving paper, recycling, turning the lights off and fixing leaking taps) (Res15 2012; Res32 2013). Res32 explained that they used an incremental and continuous improvement approach to ES.

5.6.7 Practices that attract public attention versus practices not necessarily seen by the public; marketable versus difficult to market practices

Interviewees felt organisations continuously look for ‘points of difference’ to market (e.g. OrgC, OrgD, Coles and Woolworths). Some ES practices are easier to observe and market and are, thus, more favoured (e.g. the spread of sow stall free practices). It seems the practices chosen are often those that resonate with consumers.

5.6.8 Relative advantage

This characteristic groups a number of characteristics together. Linking to 5.6.2, this characteristic is shown to influence spread.
5.6.9 Compatibility

This characteristic from DOI did not specifically emerge from the data.

5.6.10 Trialability

This characteristic was illustrated by the DAFWA Pig Innovation Group biogas demonstration project. Many of the DAFWA projects, such as Greener Pastures, offered trialability and asked farmers to participate in the project.

5.6.11 Observability

As with trialability, many of the joint government/industry projects offered observability.

5.6.12 Difficulty or intensity of ES practices

Compounding the lack of generally accepted understanding of the term ‘environmental’, is the range of intensity of ‘environmental’ issues (Res22 2012; Res2 2012). Res2 explained that there can be “environmental ‘a bit’ to ‘a lot’” (Res2 2012). Res22 of DAFWA concurred by stating that “and I suppose you know in agriculture there is a range in what it [environmental] means. To me it means I've planted trees on my farm and then I think I've done my bit…but in terms of my sheep I haven't done anything different to them because I think I am doing okay” (Res22 2012).

5.6.13 Intra-organisation versus inter-organisation ES practices

An obvious distinction in the data was between intra- and inter-organisation practices, with the former much more prevalent than the latter. This distinction was highlighted in the supermarket review, in which companies discussed their in-house and supply chain practices. The distinction was highlighted in Woolworth’s 2008 SR:

“our environmental impact and footprint extends well beyond resources directly used to operate our stores and transport goods. However, it is our responsibility to first address our immediate and direct environmental impacts before influencing those of our suppliers. This philosophy has
underpinned our boundary determination in focusing on issues we directly control or have significant influence on so we can implement improvements faster and more effectively” [italics added] (Woolworths Ltd 2008, p. 60).

The supermarket review suggested Coles and Woolworths were reluctant to assume a whole-of-supply-chain responsibility. The sustainability reports also suggested they had a policy to first improve their own ES practices (intra-organisation) before looking to influence other actors (inter-organisation).

5.6.14 Piecemeal and project based practices versus whole system

While some practices can be implemented on an ad hoc basis, such as using less paper and fixing leaking taps, major changes in business processes, such as moving from a high heat to low heat production system, required more incentives, such as government grants. Res32 noted OrgN had followed an incremental and continuous improvement approach to ES practices, in which the smaller and easier practices are implemented first. The study suggests a need for funding by government and industry representative organisations if more expensive ES initiatives are to be implemented (e.g. OrgN wanted an Australian grant to buy a methane digester). This suggests ES initiatives and practices that can attract funding are likely to spread more readily than ES practices not accompanied by funding.

5.6.15 Public versus private goods

Res31 from Western Dairy asked: “is it up to the individual to fix a community interest?” The analysis suggested the answer was ‘no’, as practices that could be considered private goods spread more than those that were public goods.

5.6.16 Practices that can be delayed

OrgM’s experience shows practices that can be delayed, often are delayed. Thus, ES practices that are necessary to keep a business operating and are enforced, spread more.
Chapter 5 presented the results from three network case studies, two in the pork industry and one in the dairy industry. Case A1 and Case B investigated the spread of ES practices in the WA pork and dairy industries, respectively. Case A2 investigated the spread of a particular group of practices (i.e. sow stall free practices) in the WA pork industry.

For each case study, relevant events were summarised chronologically in a table showing the events and the level at which the events occurred, such as at international, national, state and industry levels. The tabulated events flowed into a second table summarising the macro-processes of spread emerging from the data. Relevant events, examples of sub-processes and interview quotes were provided in the second table.

The analysis suggested each of the macro-processes identified had multiple interacting sub-processes, each of which arose from further multiple interacting processes in an iterative progression. The processes occur in series and parallel and interacted, giving rise to emergent macro-processes that influenced spread, which, in turn, influenced the processes in feedback loops. The processes and relevant events occurred at various levels and the characteristics of the practices were found to affect their spread. The results presented in Chapter 4 and Chapter 5 will be discussed in terms of the literature review in Chapter 6. Chapter 6 also discusses the contributions of the study.
CHAPTER 6 - DISCUSSION

6.1 Introduction

This Chapter discusses the results presented in Chapter 4 and Chapter 5 in terms of the research questions and objective and the initial conceptual framework. Cross-case comparisons are included in the discussions. In the cross-case comparisons, the processes involved in the spread of ES practices in the WA pork industry (Case A1) and dairy industry (Case B) are contrasted. The spread of ES practices in the pork industry (Case A1) is also compared with the spread of sow stall free practices (Case A2) in this industry. The contributions to knowledge and theory arising from the current study are then discussed in section 6.9. First, a brief discussion is presented of the results in relation to the initial conceptual framework. Thereafter, further discussion of various aspects of the results follows.

6.1.1 Discussion of the results in terms of the initial conceptual framework

In many aspects the findings concur or provide extensions to the initial conceptual framework that was presented in section 2.9. There were also findings that did not align with the initial framework.

Processes of spread

As expected, multiple processes of spread were identified that operated in parallel and in series. The findings supported the expectation of processes reinforcing and mitigating each other (i.e. there were interactions between processes). Further, the expectation that micro-level processes created upper level processes and vice versa was supported by the data. The ultimate outcomes of processes and policies were found to be unpredictable, which highlighted the cases’ network effects. The processes were observed to be made up of events as expected. However, the empirical study necessitated the extension of the definition of process, as is discussed in section 6.9.2.1. As expected, the macro-processes identified occurred at various and multiple levels, as shown in Table 36 and as discussed in more detail in section 6.5.3.
### Table 36: Levels at which macro-processes were found to occur

<table>
<thead>
<tr>
<th>Macro-processes of spread</th>
<th>Observed levels in the data</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1 Enacting and enforcing environmental (and other relevant) legislation, regulations and reporting requirements</td>
<td>National State Industry</td>
</tr>
<tr>
<td>S2 Forming and implementing joint government/industry projects concerning ES issues</td>
<td>National State Industry</td>
</tr>
<tr>
<td>S3 Developing and implementing voluntary agreements and reporting requirements</td>
<td>International National State Industry Supply chain Organisation</td>
</tr>
<tr>
<td>S4 Spread through consumers demanding practices</td>
<td>International National State Industry Supply Chain Organisation</td>
</tr>
<tr>
<td>S5 Spread through (international) movement of staff</td>
<td>International National State Industry</td>
</tr>
<tr>
<td>S6 Spread through actors wanting to ‘do the right thing’</td>
<td>Organisation</td>
</tr>
<tr>
<td>S7 Green supply chain management</td>
<td>Supply chain</td>
</tr>
<tr>
<td>S8 Spread through intermediaries</td>
<td>Organisation</td>
</tr>
<tr>
<td>S9 Spread by organisations choosing to pursue green marketing</td>
<td>Organisation</td>
</tr>
<tr>
<td>S10 Spread due to international influence and global committees</td>
<td>International</td>
</tr>
<tr>
<td>S11 Spread through pursuit of economic sustainability</td>
<td>International National State Industry Supply Chain Organisation</td>
</tr>
</tbody>
</table>
The processes of spread were found to occur both horizontally across levels and vertically between levels, as is summarised in Table 37.

**Table 37: Horizontal and vertical spread processes**

<table>
<thead>
<tr>
<th>Macro-processes of spread</th>
<th>Type of spread found in data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Horizontal</td>
</tr>
<tr>
<td>S1 Enacting and enforcing environmental (and other relevant) legislation, regulations and reporting requirements</td>
<td>✓</td>
</tr>
<tr>
<td>S2 Forming and implementing joint government/industry projects concerning ES issues</td>
<td>✓</td>
</tr>
<tr>
<td>S3 Developing and implementing voluntary agreements and reporting requirements</td>
<td>✓</td>
</tr>
<tr>
<td>S4 Spread through consumers demanding practices</td>
<td>✓</td>
</tr>
<tr>
<td>S5 Spread through (international) movement of staff</td>
<td>✓</td>
</tr>
<tr>
<td>S6 Spread through actors wanting to ‘do the right thing’</td>
<td>✓</td>
</tr>
</tbody>
</table>
As envisaged in the initial conceptual framework, processes of spread were observed that occurred through dyadic and group interactions. Spread occurred through propagation by multiple dyadic interactions, such as green SCM. The expected importance of groups (issue-based nets) was found in the data (e.g. joint government/industry projects to develop industry specific ES regulations). Another example of an issue-based net was the one formed to spread sow-stall free practices Australia-wide, rapidly. The issue-based nets are discussed further in section 6.6.1.1.

The initial conceptualisation of dyadic and group processes was extended by the empirical findings to include a “one-to-many” category, in which activities by organisations (such as government departments, consumer groups, celebrities and animal welfare groups) exert a process of spread directly to multiple other organisations. Table 38 shows the classification of the 14 macro-processes of spread into dyadic, group and/or one-to-many types. It is interesting that some processes identified showed more than one type of spread process (e.g. Imitating (S12)).

<table>
<thead>
<tr>
<th>Macro-processes of spread</th>
<th>Type of spread found in data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Horizontal</td>
</tr>
<tr>
<td>S7 Green supply chain management</td>
<td>✔️</td>
</tr>
<tr>
<td>S8 Spread through intermediaries</td>
<td>✔️</td>
</tr>
<tr>
<td>S9 Spread by organisations choosing to pursue green marketing</td>
<td>✔️</td>
</tr>
<tr>
<td>S10 Spread due to international influence and global committees</td>
<td></td>
</tr>
<tr>
<td>S11 Spread through pursuit of economic sustainability</td>
<td>✔️</td>
</tr>
<tr>
<td>S12 Imitating</td>
<td>✔️</td>
</tr>
<tr>
<td>S13 Spread through celebrity campaigns</td>
<td>✔️</td>
</tr>
<tr>
<td>S14 Spread through animal welfare campaigns</td>
<td>✔️</td>
</tr>
<tr>
<td>Macro-processes of spread</td>
<td>Type of process observed in data</td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td></td>
<td>Dyadic</td>
</tr>
<tr>
<td>S1</td>
<td></td>
</tr>
<tr>
<td>Enacting and enforcing environmental (and other relevant) legislation, regulations and reporting requirements</td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td></td>
</tr>
<tr>
<td>Forming and implementing joint government/industry projects concerning ES issues</td>
<td></td>
</tr>
<tr>
<td>S3</td>
<td></td>
</tr>
<tr>
<td>Developing and implementing voluntary agreements and reporting requirements</td>
<td></td>
</tr>
<tr>
<td>S4</td>
<td></td>
</tr>
<tr>
<td>Spread through consumers demanding practices</td>
<td></td>
</tr>
<tr>
<td>S5</td>
<td></td>
</tr>
<tr>
<td>Spread through (international) movement of staff</td>
<td></td>
</tr>
<tr>
<td>S6</td>
<td></td>
</tr>
<tr>
<td>Spread through actors wanting to ‘do the right thing’</td>
<td></td>
</tr>
<tr>
<td>S7</td>
<td></td>
</tr>
<tr>
<td>Green supply chain management</td>
<td></td>
</tr>
<tr>
<td>S8</td>
<td></td>
</tr>
<tr>
<td>Spread through intermediaries</td>
<td></td>
</tr>
<tr>
<td>S9</td>
<td></td>
</tr>
<tr>
<td>Spread by organisations choosing to pursue green marketing</td>
<td></td>
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<tr>
<td>S10</td>
<td></td>
</tr>
<tr>
<td>Spread due to international influence and global committees</td>
<td></td>
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<tr>
<td>S11</td>
<td></td>
</tr>
<tr>
<td>Spread through pursuit of economic sustainability</td>
<td></td>
</tr>
<tr>
<td>S12</td>
<td></td>
</tr>
<tr>
<td>Imitating</td>
<td></td>
</tr>
<tr>
<td>S13</td>
<td></td>
</tr>
<tr>
<td>Spread through celebrity campaigns</td>
<td></td>
</tr>
<tr>
<td>S14</td>
<td></td>
</tr>
<tr>
<td>Spread through animal welfare campaigns</td>
<td></td>
</tr>
</tbody>
</table>
Figure 13 shows a revised conceptualisation of the types of processes that includes dyadic, group and one-to-many types of spread processes. In Figure 13, organisation Z might represent a government department that legislates or enforces environmental laws or might represent a celebrity.
As expected, government played a very important role in spread. Indeed, the main macro-process of spread was the decades of well-enforced environmental laws and regulations. Further, government played an important role in joint government and industry projects, which was identified as an important spread process. Government involvement occurred at national, state and local levels. There were calls for better cooperation between the levels of government to align environmental initiatives and spread of ES practices.

The expected role government departments and industry representative organisations played as change agents was supported by the data. Unexpectedly important change agents that emerged from the data were farm consultants in cases A1 and B and celebrities (such as Jamie Oliver) in Case A2. Some organisations, such as Coles and Riverlea, can also be described as opinion leaders as suggested in the DOI literature and issue-based net initiators in the issue-based net literature, showing conceptual overlaps of these concepts that came from diverse areas of literature.

There was a surprising lack of green SCM being undertaken by the large supermarkets in relation to Australian suppliers of branded products. The level of green SCM with high risk, foreign suppliers of house-brand products was as expected in the initial framework. The supermarkets have the supply chain capability to bring about rapid changes in supply chains (as evidenced by the move to sow stall free pork and cost cutting). However, the focus of the supply chain management efforts was not environmental. The lack of use of a whole of supply chain approach by the large Australian supermarkets was surprisingly, especially when compared to the approach used by the international supermarkets that were analysed.

**Factors influencing spread**

As was expected, the context in which the organisations, industries and countries operated affected spread. These contextual factors arose from various levels, as was expected. The pork and dairy industry cases offered interesting empirical examples of how industry structure affects spread and how industry representative organisations adapted to the structure of relevant networks to enable the spread of ES (and other) practices. For example, the pork industry only has large players and, thus, spread was enabled by the close connectivity of these players. However, there were
numerous small farmers in the dairy industry, which led industry representative organisations to regionalise and make use of farm consultants to assist spread.

Based on the initial conceptual framework, trigger events, such as environmental disasters, were expected. However, the interviewees did not highlight trigger events. Instead, there was much talk about the slow steady momentum of spread arising from well enforced environmental laws and regulations.

**Characteristics of ES practices that affected their spread**

The characteristics of the practices that influenced spread suggested in the initial conceptual framework were supported by the data. The data indicated an additional characteristic (practices that can or cannot be delayed) also played a role. Next, the results are discussed in terms of the first research question.

**6.2 Addressing research sub-question 1: What are the processes involved in the spread of environmental sustainability practices in business networks?**

Table 39 summarises the processes of spread of ES practices emerging from the three case studies. The table presents the prevalence levels of the processes for the various organisation types (farmers, processors and retailers).

**6.2.1 Comparison of the processes of spread of ES in the pork and dairy industries (Case A1 versus Case B)**

As seen in Table 39, the processes were very similar in the pork (column C) and dairy (column E) industries. Both cases had multiple processes of spread, which occurred in series (one after the other over time) and in parallel (simultaneously). Both cases suggested the macro-processes of spread arose from other processes, in an iterative way.
Table 39: Summary and cross-case comparison of processes of spread
(H= high prevalence, M= medium prevalence, L= low prevalence; ‘n/a’ indicates not applicable since no data)

<table>
<thead>
<tr>
<th></th>
<th>Macro-processes of spread</th>
<th>Case A1: pork ES practices</th>
<th>Case A2: pork sow stall free practices</th>
<th>Case B: dairy ES practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A)</td>
<td>(B)</td>
<td>(C)</td>
<td>(D)</td>
<td>(E)</td>
</tr>
<tr>
<td></td>
<td>Farmers</td>
<td>Processors</td>
<td>Retailers</td>
<td>Farmers</td>
</tr>
<tr>
<td>S1</td>
<td>Enacting and enforcing environmental (and other relevant) legislation, regulations and reporting requirements</td>
<td>H</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>S2</td>
<td>Forming and implementing joint government/industry projects concerning ES issues</td>
<td>H</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>S3</td>
<td>Developing and implementing voluntary agreements and reporting requirements</td>
<td>H</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>S4</td>
<td>Spread through consumers demanding practices</td>
<td>L</td>
<td>L</td>
<td>M</td>
</tr>
<tr>
<td>S5</td>
<td>Spread through (international) movement of staff</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>S6</td>
<td>Spread through actors wanting to ‘do the right thing’</td>
<td>L</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>S7</td>
<td>Green supply chain management</td>
<td>L</td>
<td>L</td>
<td>M</td>
</tr>
<tr>
<td>(A)</td>
<td>(B)</td>
<td>(C)</td>
<td>(D)</td>
<td>(E)</td>
</tr>
<tr>
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</tr>
<tr>
<td></td>
<td></td>
<td>Farmers</td>
<td>Processors</td>
<td>Retailers</td>
</tr>
<tr>
<td>S8</td>
<td>Spread through intermediaries</td>
<td>M</td>
<td>M</td>
<td>M</td>
</tr>
<tr>
<td>S9</td>
<td>Spread by organisations choosing to pursue green marketing</td>
<td>L</td>
<td>L</td>
<td>H</td>
</tr>
<tr>
<td>S10</td>
<td>Spread due to international influence and global committees</td>
<td>H</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>S11</td>
<td>Spread through pursuit of economic sustainability</td>
<td>H</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>S12</td>
<td>Imitating</td>
<td>H</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>S13</td>
<td>Spread through celebrity campaigns</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>S14</td>
<td>Spread through animal welfare campaigns</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>
6.2.1.1 Similarities in ES processes

The key process identified in both industries was a slow and steady momentum arising from enacting and enforcing environmental legislation, regulations and reporting requirements over a number of decades (denoted as S1 in column A). This finding corresponds with Hall’s (2000) contention that environmental legislation is a key to organisations adopting intra-organisation and supply chain ES practices.

The cases suggest government organisations are active participants in the processes of spread. This was expected, as many ES practices relate to public goods and market failure that may result in free rider, negative externalities and ‘tragedy of the commons’ problems (Chander, Drèze & Lovell 2007; Kotchen 2012). All levels of government played a role in the spread of ES practices. The Australian Government, through funding, was often able to direct areas of research and projects (Res6 2013). The WA State Government was instrumental in rolling out the Farming for the Future (FFF) project. However, following the project’s lack of success, which was discussed in section 5.2.6.5, the State seems reluctant to operate in the environmental management system (EMS) area. However, it is increasingly involved in carbon mitigation projects (particularly when co-funded by the Australian Government). Local government’s representative organisation felt there was difficulty in communicating ‘sustainability’ ideas to the electorate. However, it had teamed up with others (mainly the Australian Government) on ES projects.

As seen in Table 39, both cases showed the importance of joint government/industry projects (S2), voluntary agreements and reporting requirements (S3), international influence and global committees (S10) and the pursuit of economic sustainability (S11). The cases were also similar in the low prevalence of some processes. For example, while both cases showed the impact of Coles’ and Woolworths’ supply chain power, they were not using green SCM (S7) with their Australian suppliers as much as might have been expected, although it was being used with some foreign, house-brand product suppliers. Both cases suggested spread was not greatly impacted by consumers demanding ES practices (S4) or by organisations choosing to pursue green marketing (S9). The low prevalence of these interrelated processes is likely to cause negative feedback effects, leading to still lower prevalence. S4 also relates to findings that suggested a lack of pressure from Australian consumers for ES
credentials and unwillingness to pay a premium for such credentials; yet an expectation of a high level of ethical behaviour from Australian organisations. Thus, process S4 is an important background process, but not a process that results in the spread of ES on its own. Similarly, while S9 was used in both industries, it was not seen as key when targeting the average Australian consumer, who interviewees thought were more interested in price, especially for commodity products.

6.2.1.2 Differences in ES processes

Some differences in the prevalence of processes between the cases can be understood in terms of differing industry structure and conditions (such as margins and culture). For example, the WA and Australian pork industries have a small number of large farmers, whereas the dairy industry has a large number of small farmers. Res6 commented that “so between the two - dairy and pork industries - they are two very different industries in terms of their culture and the way they are structured and does that have an influence on their uptake of these sorts of programmes as well?” (Res6 2013). Interviewees also indicated “skinny margins” (Res34 2013) in the dairy industry and comparatively higher margins in the pork industry (Res6 2013).

Government departments and industry organisations have adapted to the differing industry structures. For example, the dairy industry uses a regionalised industry representative structure and makes use of farm consultants to roll out joint government/industry projects (S8). However, the pork interviewees did not indicate farm consultants (S8) were used to the same extent. The dairy industry was regarded as a ‘model’ industry in terms of joint government/industry programmes that were already in place at the time of the FFF project (England & White 2009).

The pork industry interviewees indicated the UK influenced the WA pork industry, whereas their dairy counterparts did not suggest as strong an influence. Related to this finding, the pork industry data shows prevalence of spread of ES through (international) movement of staff (S5), while the dairy data did not highlight this process. While spread through imitating (S12) occurred in both cases, prevalence among farmers and processors in the pork industry appeared higher than in the dairy industry. This may be due to the small number of key participants in the pork industry and the large number (particularly farmers) in the dairy industry.
6.2.1.3 Prevalence across organisation types

The prevalence of some processes was the same across organisation types (such as processes S1-3, S5, S6, S10, S11), although other processes differed (such as S4, S7, S8, S9 and S12), perhaps because some processes targeted particular organisation types. For example, the Australian Packaging Covenant (APC) is more relevant to processors and retailers than to farmers. Also, green SCM may be more relevant to supply chain leaders that, in food supply chains, are large retailers. These prevalence patterns across the two industries were similar. Thus, farmers in both industries had similar prevalence of processes and the same was true for processors and retailers.

6.2.1.4 Approaches to ES

The general approach to ES in both industries was largely project-based and piecemeal (such as the APC addressing packaging and the Greener Pastures project addressing fertiliser use). Some organisations followed a continuous improvement approach to ES, such as OrgN, but many only reacted to legislation. Some projects, such as the FFF, attempted to cover all sustainability areas (economic, social and environmental) using a holistic approach. Res8 (2013) criticised government policies for lacking a ‘big picture’ and an integrated approach, as they were most concerned about re-election rather than long-term sustainability. However, government funding was needed for some major changes, such as moving from a high heat to low heat system (OrgA).

6.2.1.5 Synopsis

It was clear the processes of spread of ES practices were very similar in the WA pork and dairy industries. The general process in both cases was a slow, steady momentum over many decades that relied on the enactment and enforcement of environmental legislation, regulations and reporting requirements. Supporting this key process were 11 other macro-processes that emerged from further sub-processes.
6.2.2 Comparison of the processes of spread of ES and sow stall free practices in the pork industry (Case A1 versus Case A2)

As seen in Table 39, the processes of spread of sow stall free practices (column D) had different prevalence patterns to the spread of ES practices (column C) in the WA pork industry. The spread of sow stall free practices related to a small group of practices, while the spread of ES practices related to a wide range of practices. The spread of sow stall free practices in Australia was rapid (peaking in 2010-2013) compared to the slow steady momentum of spread of ES practices that took many decades.

6.2.2.1 Differences in processes

Interviewees suggest Australian consumers respond more to animal welfare than to ES credentials making spread through consumer demand (S4) and spread by organisations choosing to pursue green marketing (S9) much more prevalent in the sow stall free case, particularly with retailers. Two additional processes emerged in the sow stalls case (spread through celebrity (S13) and animal welfare (S14) campaigns) that were not found in the ES case.

A notable difference between the processes in the two pork cases was in the use of supply chain capability and power (S7), particularly by Coles and Woolworths in relation to Australian suppliers. In the sow stall free spread, SCM was used extensively by the large supermarkets, whereas it was used much less in the ES case.

It is interesting that Coles and Woolworths spread ES practices to some foreign, house-brand suppliers using SCM but not to their Australian suppliers, whereas with sow stall free they focused their SCM efforts on their Australian suppliers, rather than on their foreign suppliers.

Another key difference is that the spread of ES practices was based on government intervention (S1), whereas the industry move to sow stall free practices was voluntary (S3), as there is no legislation banning the use of sow stalls in Australia. However, as sow stalls were banned in the UK in 1999 and in the rest of the EU in 2013, interviewees (Res5 2012; Res21 2012) suggested an underlying impetus for the voluntary phasing out of sow stalls in Australia was the potential of legislation being enacted in Australia.
Spread through global committees (S10) was not as important in the spread of sow stall free practices; reflecting a general lag in global action on animal welfare issues compared to ES issues. This lag is also evident in GRI reporting requirements, as animal welfare criteria were included much later than ES. Related to the spread through international influence (S10) was spread through the (international) movement of staff, which appeared to be more important in the spread of sow stall free than in the spread of ES practices.

While joint government/industry projects (S2) and spread through intermediaries (S8) were important in the spread of ES practices, the data did not suggest these were as important in the spread of sow stall free practices. Spread through the pursuit of economic sustainability (S11) played less of a role in the spread of sow stall free (since sow stalls are a net cost for these organisation types) than in the spread of ES practices for farmers and processors. However, the economic sustainability of sow stalls appeared to be important to retailers, as they chose to spread and market sow stall free practices, while they did not use ES as a marketing platform.

6.2.2.2 Similarities in processes

The cases were similar in some aspects, as spread was not due to actors wanting to ‘do the right thing’ (S6), whereas international influence (particularly the UK) (S10) and imitating (S12) did play a role in both cases.

6.2.2.3 Synopsis

The spread of sow stall free practices was based on more notable events. Interviewees all cited the same events (such as Jamie Oliver’s television show and the UK banning sow stalls), whereas interviewees could not think of specific events relating to their use of ES practices, such as ES disasters, but rather a growing general awareness and momentum of spread of ES issues. The spread of sow stall free practices was more rapid than was the spread of ES practices, demonstrating Coles’ and Woolworths’ ability to use their supply chain power to bring about industry change. The cases also show the importance of consumers, as their response to sow stall free issues enabled spread, whereas a lack of a consumer response to environmental issues hindered spread; leading to a need for government intervention in relation to ES.
6.3 Addressing research sub-question 2: What factors influence the spread of environmental sustainability practices?

Table 40 shows a summary of the factors promoting spread. The three cases highlighted the importance of international, Australian, WA, industry and organisational aspects (factor 1 in Table 40). For example, the focus on ES at an international level through UN conferences on climate change and the Kyoto Protocol agreement created an enabling environment that influenced the WA pork and dairy industries directly and indirectly. Examples of Australian level aspects that created an enabling environment included Australia’s participation in international agreements, such as the Kyoto Protocol, Australian environmental legislation, regulations and reporting requirements and Australia’s first world status. WA level examples included WA environmental legislation and first world status. Pork and dairy industry level examples included the proactivity of industry representative organisations and joint government/industry projects. Organisational level aspects that enabled spread included the economic viability of the organisation, organisation size and product type (e.g. commodity versus niche).

Table 40: Cross-case comparison of factors promoting spread

<table>
<thead>
<tr>
<th>Factor</th>
<th>Case A1: Pork ES</th>
<th>Case A2: Pork sow stall free</th>
<th>Case B: Dairy ES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Enabling</strong></td>
<td>Multiple enabling factors</td>
<td>Multiple enabling factors at multiple levels.</td>
</tr>
<tr>
<td></td>
<td><strong>international,</strong></td>
<td>at multiple levels.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Australian, WA,</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>industry and</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>organisational</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>aspects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td><strong>Embeddedness</strong></td>
<td>Small number of closely</td>
<td>Small number of closely knit actors.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>knit actors.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td><strong>Marketability</strong></td>
<td>n/a.</td>
<td>Sow stall free marketing led by Coles since 2010. Also marketed by UK supermarkets prior to 2010.</td>
</tr>
</tbody>
</table>
These aspects created an enabling environment within which the WA pork and dairy industry networks operated. These aspects resonate with the concept of ‘context’ and its influence on network change (as was discussed in section 2.4.1.10). The cases showed the importance of embeddedness (factor 2 in Table 40). For example, the strong relationships between the small number of key actors in the WA and Australian pork industry assisted the spread of both ES and sow stall free practices. Industry representative organisations and joint government/industry projects enabled more closely knit relationships between industry participants that, in turn, promoted the spread of practices. Marketability (factor 3) refers to a characteristic of the practice being spread and is discussed further in section 6.4. However, it is included in Table 40 because it is a key factor affecting the spread of sow stall free practices, while the lack thereof influenced the other two cases of spread of ES practices.

Table 41 summarises the results of the factors hindering spread. While the two cases dealing with the spread of ES practices were very similar in the factors hindering spread, Table 41 shows that many of the barriers applicable to ES did not apply to the spread of sow stall free practices.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Case A1: Pork ES</th>
<th>Case A2: Pork sow stall free</th>
<th>Case B: Dairy ES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cost and lack of economic sustainability.</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>2</td>
<td>Lack of consumers’ willingness to pay for ES attributes.</td>
<td>✔</td>
<td>No data</td>
</tr>
<tr>
<td>3</td>
<td>Unintended consequences, trade-offs and inconsistencies.</td>
<td>✔</td>
<td>No data</td>
</tr>
<tr>
<td>4</td>
<td>Lack of integration and ‘big picture’ thinking.</td>
<td>✔</td>
<td>No data</td>
</tr>
<tr>
<td>5</td>
<td>ES practices associated with public goods.</td>
<td>✔</td>
<td>No data</td>
</tr>
</tbody>
</table>
Comparing the two ES cases, the factors of difference (factors 3, 7, 9 and 10) emerged due to lack of data regarding these issues, rather than data indicating contrasting results; it is submitted that these barriers are likely to be relevant to both industries. Thus, the factors hindering spread of ES practices concurred in the WA pork and dairy industries.

Both the pork ES and sow stall cases suggested spread was hindered by the costs of the practices and the effect such costs had on the economic sustainability (factor 1) of the organisations involved, especially as the average Australian consumer does not seem to be willing to pay a premium for ES (factor 2). This barrier was not as pronounced in the spread of sow stall free products as supermarkets, such as Coles, agreed to share some of the cost burden and the interviews suggested consumers were more willing to pay for improved animal welfare. The unintended consequences (factor 3) relates to the spread of sow stalls but has not been a barrier to spread, as the spread occurred despite the potential adverse consequences of higher welfare systems on ES if not managed correctly. Lack of integration (factor 4) does not relate to the sow stall case, as the set of practices in this case were integrated. Table 41 shows the issue of ‘public goods’ (factor 5) arose with the spread of ES, whereas it did not in the sow stall spread case. This can be understood in terms of supermarkets being able to reap a benefit from sow stall free marketing campaigns and passing increased revenue to pig farmers to assist with their increased
costs. The contextual aspects in factor 6 did not relate to the sow stall case because of Coles’ leadership role. Piggeries and the pork industry had no choice but to follow (Res21 2012). The different rules in different countries (factor 7) did not hinder the spread of ES in the pork industry, but did hinder the spread of sow stall free practices. Interviewees noted Australian purchasing power over imported pork is not large enough to bring about industry changes in supplier countries. The multiple and competing business objectives (factor 8) related to ES and not to sow stall free practices because Coles’ decisions left the industry with little choice but to follow. Delaying ES practices (factor 9) and lack of succession planning (factor 10) relate more to ES than sow stall free practices.

Overall, the factors influencing the processes of spread in the case study data are many and operate at various levels. The factors are organisation, industry, state and country specific, while also arising at the global level. The influencing factors resonate with the endogenous and exogenous factors (Håkansson & Snehota 1995) and multiple levels of context (Halinen, Medlin & Törnroos 2012; Makkonen, Aarikka-Stenroos & Olkkonen 2012) relating to change processes in networks.

6.4 Addressing research sub-question 3: How do characteristics of environmental sustainability practices affect their spread?

Similar to findings in many diffusion of innovations studies (Rogers, 2003), the data suggested the spread of ES practices was affected by the practices’ characteristics. Table 42 compares the characteristics arising from the case study results (discussed in section 5.6) to potential characteristics identified in prior research (please see Table 3).

<table>
<thead>
<tr>
<th>Characteristics of ES practice:</th>
<th>Identified in prior research (Table 3)</th>
<th>Reflected in the data (section 5.6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a Legislated versus voluntary (Hall 2000).</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>b Short-term versus long-term (or no) economic benefits (Drury 2008).</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Characteristics of ES practice:</td>
<td>Identified in prior research (Table 3)</td>
<td>Reflected in the data (section 5.6)</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>--------------------------------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>Preventative, appraisal, internal failure and external failure practices (Drury 2008).</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Strategic versus reactive (Krause, Handfield &amp; Scannell 1998).</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Independent versus cooperative (Håkansson et al. 2009).</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Easy versus complex (Hall 2000; Rogers 2003).</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Practices which attract public attention versus practices not necessarily seen by the public (Greenwashingindex.com 2012), also referred to as marketable versus non-marketable (Hall 2000).</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Relative advantage (economic profitability, low initial cost, a decrease in discomfort, social prestige, a saving of time and effort, and immediacy of reward) (Rogers 2003)</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Compatibility (Rogers 2003)</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Trialability (Rogers 2003)</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Observability (Rogers 2003)</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Difficulty or intensity of ES practices (Sanchez-Rodriguez, Hemsworth &amp; Martinez-Lorente 2005)</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Intra-organisation versus inter-organisation ES practices (Srivastava 2007).</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Piecemeal / project based environmental practices versus whole system environmental management (Lee 2010).</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Practices related to public versus private goods (Chander, Drèze &amp; Lovell 2007).</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Practices that can versus cannot be delayed.</td>
<td>-</td>
<td>✔</td>
</tr>
</tbody>
</table>
As can be seen in Table 42, the data provided illustrations of all the characteristics previously identified. In addition, the characteristic shown as item ‘p’ has not previously been identified in the literature.

The cases suggested the key distinguishing characteristics of practices influencing spread had a legislated versus voluntary distinction (item a) and a distinction between ES practices with and without net economic benefits (items b and h). Another important distinction is between intra- and inter-organisation ES practices (item m), with the former more prevalent. A further important aspect was the public good argument (item o). Since many ES practices are associated with the provision of public goods, there is a classic market failure and the under-provision of public goods, together with negative externalities, free rider problems and ‘tragedy of the commons’ problems. Hence, government intervention would be expected to be needed to address these public good issues, which coincides with the finding that legislated practices spread more readily than did voluntary practices (item a). The identification of item p, the distinction between practices which can and cannot be delayed is a contribution to the prior literature.

6.5 Addressing the overall research question: How and why are environmental sustainability practices spread between organisations in business networks?

Considering the main research question, the case studies provided the following insights.

6.5.1 Composition of the processes

The three case studies suggested spread arises from multiple, interacting sub-processes, each of which emerges from further multiple, interacting sub-processes. This iterative cascading of processes continues until a desired level of detail is reached. This finding supports Halinen et al.’s (2012) research that found several micro-level processes created upper level processes. They also found upper level processes may create several micro-level processes. This is illustrated in the current study where a course of action (an upper level process), such as a decision by the minister in WA to engage in the Farming for the Future project, led to multiple micro-processes (such as interactions in each industry between WA government departments, industry representative organisations and industry participants). In each...
industry, these processes led to further sub-processes, such as interactions between government department officers and individual farmers. Thus, the data and the literature showed a bottom-up and a top-down cascading of processes.

### 6.5.2 Interaction between processes

The case studies suggested the multiple processes of spread interact and give rise to macro-processes that cannot be viewed as a sum of the underlying processes. Instead, the macro-processes emerge from *interactions* between the underlying processes, as well as interactions between the processes and the influencing factors, as discussed in section 6.3. The emergence of macro-processes of spread resonates with the unpredictable ‘network effects’ in the IMP network literature (Håkansson & Snehota 1995) and the ‘emergence’ property of complex systems (Mitleton-Kelly 2003).

The interacting sub-processes may occur in series or parallel. While some processes may not bring about spread in isolation, when combined with other processes, concurrent or preceding, macro-processes of spread may emerge. For example, the FFF project was not successful in bringing about the widespread adoption of ES practices, yet it created an awareness of ES among project participants, which assisted the success of other projects, such as Greener Pastures, which occurred later; illustrating sequential reinforcement.

The emergence of macro-processes of spread are likely to vary between networks due to differences in the combination of sub-processes in the network, their timing (occurrence in series or parallel), the relevant influencing factors and the interactions between the sub-processes and between the sub-processes and the influencing factors.

The current study illustrates the difficulty in defining a ‘process’ because of the challenges in deciding where processes begin and end, since some processes lay the groundwork for future processes. For example, the FFF project provided an awareness that influenced the subsequent Greener Pastures project. The question arises as to whether the two projects are part of one process or whether they are two distinct processes. The current study suggests such decisions depend on the purpose of the study and the level of detail required. For example, is it sufficient to understand the FFF project as a process or is it necessary to delineate the sub-
processes of this process to improve understanding? Also, is it sufficient to understand the Greener Pastures project or should the influence of the FFF be included? It seems such decisions are study specific.

6.5.3 Multiple levels

The case studies show the processes of spread and the events making up these processes occur at multiple levels (such as the international, national, state, industry, supply chain, dyadic and organisational levels). For example, some processes occur at an international level, such as the process of spread through the operations of the UN conferences on climate change. Examples of processes at a national level included the enactment of environmental legislation, while processes at a State (WA) level included the FFF project. An example at a supply chain level was Coles’ green SCM practices, particularly with foreign suppliers of house-brand products. Coles’ development of a particular foreign supplier of house-brand products is an example at a dyadic level.

Thus, at each level, multiple processes occur in series and parallel. Further, the influencing factors arise from various levels, particularly due to the borderless nature of the ‘sustainability’ concept. These findings resonate with Halinen et al.’s (2012) finding that parallel processes may occur at the same level or at different levels. They suggest events and processes from different levels (such as individuals, organisations, relationships and nets) connect with each other. The current study also found processes connect the levels (such as Woolworths operating at various levels). The findings also relate to the micro-, meso- and macro-level processes discussed by Elo et al. (2010).

Some of the macro-processes shown in Table 39 operate only at some levels (such as global committees at an international level), whereas some can occur at various levels, often involving different actors. For example, the movement of staff (S5) operated at international, national and local levels, involving different actors in each instance. Actors in the WA pork and dairy networks interacted directly or indirectly at the various levels. Figure 14 provides a graphical example of the actors in the WA pork industry Case A1 interacting at various levels.
Figure 14: WA pork industry actors operating at various levels

Most actors interact directly at dyadic and supply chain levels, while some interact directly and play influential roles at state, national and global levels. For example, DAFWA, the DER, industry representative organisations, the Australian Government and the large retailers influenced the processes of spread of ES practices at a state level. The Australian Government, Coles and Woolworths interacted directly at a...
national level. The Australian Government and Woolworths participated in processes at an international level by taking part in the Kyoto Protocol and serving on international committees, respectively. Thus, some actors interact directly at multiple levels (e.g. the Australian Government and Woolworths) while others operate directly only at the dyadic and supply chain levels.

It seems most organisations in the current study interacted indirectly at most levels because of the top-down and bottom-up effects of the processes of spread. For example, although a small company may not interact directly at an international level, it may implement practices and be part of processes at a dyadic and supply chain level, which, when combined with the practices of numerous other small companies, creates a groundswell of practices recognised by State departments and organisations such as Woolworths and, hence, are communicated at higher levels. Such a bottom-up process may gain momentum and attract the attention of actors interacting at an international level, resulting in the small company indirectly interacting at an international level.

Thus, processes at one level may result in macro-processes at that level and/or may form part of a process arising at a higher level. A process at one level may also influence the emergence of a process at a lower level. Further, some processes may connect multiple levels, such as Woolworths sitting on international committees and bringing international best practices to its Australian processes, state processes, supply chain and dyadic processes. Similarly, Woolworths may bring dyadic, supply chain, state and Australian practices to the attention of other international actors at international meetings and, in this way, spread practices to other nations and organisations.

Another characteristic associated with ‘levels’ is the differing effects of decisions made at various levels. For example, when there is green SCM in a large global company, top level ES decisions can affect operations and suppliers throughout the world (global level decisions and ES practices). On the other hand green SCM decisions in a small local company affect only its local suppliers (local level decisions and ES practices).
Espinosa and Walker (2011) discussed ES issues using Beer’s (developed since the 1950s) Viable System Model. Applying the idea of the recursive organisation here, one may suggest some processes and actors need to interact at the various levels (global, national, state, industry, supply chain and dyadic) to bring about spread at each level, which together assists macro-level spread. The difficulty in implementing a recursive organisation approach is the lack of some processes of spread at some levels; particularly at an international level (e.g. there is no internationally enforced environmental legislation).

Diffusion studies (Rogers 2003) often examine the spread of practices within a particular level, such as individuals in a community or organisations in an industry. Green SCM studies focus on spread between levels, where a supply chain leader operating at a supply chain and industry level spreads practices to organisations operating at dyadic and organisational levels. Another example of spread between levels arising from green SCM is where Woolworths spreads ES practices internationally through arrangements with foreign suppliers, at national and state levels through arrangements with Australian suppliers, as well as at supply chain and dyadic levels. The complexity science and business network literature has discussed ‘levels’ in the emergence of macro-level behaviour from underlying micro-level behaviours, which resonates with the finding of ‘levels’ in the current study.

6.6 Further discussion in terms of the literature review

6.6.1 Network theory

6.6.1.1 Mobilisation of groups of organisations

The data shows the important role played by the mobilisation of groups of organisations, such as joint government/industry projects (process S2 in Table 39). These projects included the development of industry-specific ES guidelines in the pork and dairy industries, the agreement by the Australian pork industry to voluntarily phase out sow stalls, the Farming for the Future project and the UN conferences on climate change. These examples suggest groups operate at various levels, such as at a state level (e.g. the Farming for the Future project), an Australian level (e.g. the voluntary phasing out of sow stalls) and a global level (e.g. the UN conferences addressing climate change). The data suggested government plays an
important role in the formation and operation of many of these groups, which was expected, as many ES practices relate to the provision of public goods. These groups of actors can be interpreted as issue-based nets, as discussed in section 2.4.1.5. Table 43 provides examples of issue-based nets from the study. As seen in the table, some actors, such as DAFWA, participate in a number of issue-based nets.

The study shows how issue-based nets operate within a broader context of other processes of spread. For example, industry-specific environmental guidelines for the pork industry (example 1 in Table 43) emerged through the formation of issue-based nets involving government departments, research organisations, industry representative organisations, not-for-profit companies and companies within the context of other processes of spread that are set out in Table 39.

The data illustrated issue-based nets occurred in series over time, such as the Greener Pastures issue-based net (example 5) that followed the Farming for the Future issue-based net (example 3). Concurrent operation of issue-based nets was also found, such as the UN conferences on climate change (example 4) occurring at the same time as the Farming for the Future project.

The outcomes of issue-based nets (such as an increased awareness of ES through the FFF project) lingered after the dissolution of the issue-based net and, hence, affected future issue-based nets and other processes of spread. While prior literature considered issue-based nets in isolation (e.g. initiatives to save the Baltic Sea (Ritvala & Salmi, 2010, 2011)), the current study examined interactions between issue-based nets and between issue-based nets and other processes of spread. The cases suggested some issue-based nets were made up of smaller issue-based nets. For example, the Farming for the Future net was made up of issue-based nets for each industry and each industry net was made up of nets focusing on various sustainability aspects.
Table 43: Examples of issue-based nets in the data

<table>
<thead>
<tr>
<th>Example</th>
<th>Issue</th>
<th>Members</th>
<th>Key members</th>
<th>Success/ Failure</th>
<th>Level</th>
<th>Factors contributing to success/failure</th>
<th>Who reaps benefits and incurs costs?</th>
<th>Who has the power in the net?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> Development of industry-specific national environmental guidelines for the pork industry in 2004</td>
<td>To make the ES legislation more industry-specific to assist compliance.</td>
<td>Regulators (e.g. DER, DAFWA, Pig Innovation Group, farm consultants, WAPPA, APL, industry.</td>
<td>APL, DER, DAFWA</td>
<td>Success</td>
<td>Austra-lian</td>
<td>The benefits of success relate to all members of the net.</td>
<td>All members benefit equally since industry has to comply with rules that apply to their industry and regulators have improved compliance. State Government incurs facilitating costs.</td>
<td>Power is shared between the members.</td>
</tr>
<tr>
<td><strong>2</strong> Initiative that resulted in the voluntary phasing out of sow stalls in Australia</td>
<td>To phase-out the use of sow stalls in Australia.</td>
<td>DAFWA, Pork Innovation Group, APL, Coles, Woolworths, Rivalea, large pork producers, not-for profit organisations and consumers.</td>
<td>Coles, Rivalea, Woolworths</td>
<td>Success</td>
<td>Austra-lian</td>
<td>Once Coles, Woolworths and Rivalea decided to move to sow stall free, the other organisations needed to follow because a critical mass was reached.</td>
<td>Coles and Woolworths benefit since they reap a marketing advantage. Consumers benefit since they called for sow stall free products. The farmers bear the costs together with assistance from retailers and consumers.</td>
<td>Coles has the power due to its influence over the market.</td>
</tr>
</tbody>
</table>

324
<table>
<thead>
<tr>
<th>Example</th>
<th>Issue</th>
<th>Members</th>
<th>Key members</th>
<th>Success/Failure</th>
<th>Level</th>
<th>Factors contributing to success/failure</th>
<th>Who reaps benefits and incurs costs?</th>
<th>Who has the power in the net?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A)</td>
<td>(B)</td>
<td>(C)</td>
<td>(D)</td>
<td>(E)</td>
<td>(F)</td>
<td>(G)</td>
<td>(H)</td>
<td>(I)</td>
</tr>
<tr>
<td>3</td>
<td>Farming for the Future project</td>
<td>To implement on-farm practices to allow for green accreditation.</td>
<td>DAFWA, industry organisations pilot project farmers, Australian Government.</td>
<td>DAFWA, industry organisations</td>
<td>Failure</td>
<td>State</td>
<td>Key issues were a lack of consumer demand for green accreditation and lack of buy-in from farmers.</td>
<td>Australian and State Government and farmers bear the costs. No apparent benefits except awareness of ES issues and readiness should there be a demand for green accreditation in the future.</td>
</tr>
<tr>
<td>4</td>
<td>UN conferences addressing climate change</td>
<td>To address climate change.</td>
<td>Governments, international bodies, not-for-profit organisations.</td>
<td>UN, leading countries.</td>
<td>Ongoing issue.</td>
<td>Global</td>
<td>Problems arise from differences in the needs of developed and developing countries regarding climate change as well as public good problems.</td>
<td>Costs borne by UN and developed nations on a voluntary basis. Benefits reaped globally.</td>
</tr>
<tr>
<td>Example</td>
<td>Issue</td>
<td>Members</td>
<td>Key members</td>
<td>Success/Failure</td>
<td>Level</td>
<td>Factors contributing to success/failure</td>
<td>Who reaps benefits and incurs costs?</td>
<td>Who has the power in the net?</td>
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<td>(A)</td>
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<td>(F)</td>
<td>(G)</td>
<td>(H)</td>
<td>(I)</td>
</tr>
<tr>
<td>5</td>
<td><strong>Greener Pastures Project</strong></td>
<td>Efficient fertilizer use.</td>
<td>DAFWA, Western Dairy, dairy farmers, farm consultants.</td>
<td>DAFWA, farm consultants</td>
<td>Success</td>
<td>The issue was framed to farmers as an economic issue, not an environmental issue.</td>
<td>Costs borne by the State Government and benefits in terms of cost savings reaped by farmers.</td>
<td>The power is shared.</td>
</tr>
</tbody>
</table>
Some findings in the current study are similar to prior issue-based net studies. For example, the issue-based nets tended to be formed by a small group of highly motivated actors (see column D in Table 43). The government was instrumental in facilitating many issue-based nets, often providing funding for their formation and operation. This role was expected given the public good aspect noted earlier. As in prior studies (Ritvala & Salmi 2011), the way the issue is framed to target organisations is important for mobilisation, such as in the Greener Pastures project in the WA dairy industry, in which project officials framed efficient fertiliser use to farmers in business terms rather than in environmental terms, contributing to farmers’ greater engagement than was the case in other States in which only the environmental aspects were highlighted.

The political dimension of issue-based nets and power struggles highlighted by Araujo and Brito (1998) were important in some, but not all, nets in this study. For example, power struggles were important in the sow stall free net (example 2), as Woolworths did not want to give Coles a ‘point of difference’ and so joined the sow stall free initiative; whereas power struggles were not mentioned in the development of industry-specific guidelines (example 1). Both the current and previous studies (Ritvala & Salmi 2011) highlighted the reputational and revenue benefit (economic) motivations for target organisations joining an issue-based net. This study illustrates why organisations mobilise an issue-based net additional to reasons found in previous studies, such as the formation of issue-based nets to develop industry-specific guidelines so as to avoid restrictive legislation.

Industry structure influenced issue-based net formation and operation. For example, the pork industry has a small number of large producers, making it easier to get important actors together to discuss issues. In contrast, the WA dairy industry has many small farmers which led to the industry representative organisation, rather than farmers, having a major role in the issue-based nets. The role of consultants in the issue-based nets was clearer in the dairy industry, which again related to the industry’s structure.

This study provided illustrations of successful and unsuccessful issue-based nets (as shown in column E), as well as success factors for issue-based nets (column G). Success factors include the need to take industry structure into account in net
formation, the importance of input from institutional actors and the need for actors in the net to operate on various ‘levels’ for spread to occur at and between multiple levels. The study suggested the complexity of an ‘issue’ may influence the success of an issue-based net, as nets concerned with more narrowly-focused and targeted issues (such as the Greener Pastures project) tended to have more success than nets around broader-based issues (such as the FFF project). Previous studies have focused on *successful* issue-based nets (e.g. Ritvala & Salmi 2010, 2011). The detailed investigation of the Farming for the Future project (section 5.2.6.5) contributes insight into *unsuccessful* issue-based nets, contributing to our knowledge.

**6.6.1.2 ARA scheme of analysis**

In terms of the Activity-Resource-Actor (ARA) scheme of analysis, there were many ES *activities* (practices) in the study. Intra-organisation ES activities and practices were more common than were inter-organisation activities and there was a lack of a whole-of-supply-chain and lifecycle approach. The *resources* for ES practices were often a stumbling block to implementing voluntary ES practices. Government funding was an important incentive that tipped the cost/benefit balance to a net benefit. Government often provided the resources for ES projects and practices in the case studies. However, due to the need for government funding and a project based approach, networks were less likely to be developing ES practices broadly. Most of the *actors* involved in the spread of ES were expected based on prior research, such as governments, industry representative organisations and green specialist companies. Unexpectedly, influential actors were intermediaries such as farm consultants.

Incremental evolution would best describe the spread of ES in the WA pork and dairy industries that took place over many decades. However, the spread of sow stall free practices can be described as radical change. The interviewees did not mention ES disaster events that triggered ES practices, as contemplated by Harilainen (2009). In the sow stall free spread, there were more decisive events that interviewees believed influenced the process, such as Jamie Oliver’s television show and Coles’ decision to source sow stall free fresh pork, which seem to resonate more with the ‘trigger’ events referred to in the literature. An example of Harilainen’s contemplation of spread of CSR practices in the data can be seen in Coles’ decision...
to go sow stall free (trigger event). This led to interactions between Coles and
suppliers (e.g. Coles-OrgA dyad) and Coles assisted OrgA financially to go sow stall
free. OrgA then interacted with farmers from which it sourced products and spread
the sow stall free practices, through interactions in those dyads. Coles also interacted
in a similar fashion with its other suppliers and radiated changes in connected dyads.
However, while this process described in Harilainen’s terms is indeed a process, it is
only a component of a ‘bigger picture’, which is captured when considering events
and processes on more levels and in a wider network. For example, preceding Coles’
decision to go sow stall free for fresh pork is a process arising from Jamie Oliver’s
television show being screened in Australia, as the show is seen as a trigger event,
resulting in consumer reactions which were communicated to Coles through their
consumer feedback systems. Coles responded to this consumer reaction as already
described. As was discussed in Chapter 5, many other factors contributed to these
two processes as described, which form part of further processes, such as the 1999
banning of sow stalls in Britain and the movement of British Tesco staff to Coles.
Other related dyadic interactions are apparent, such as the spread of the Jamie Oliver
television show from the UK to Australia. An issue-based net was then formed in
which the pork industry took the decision to voluntarily phase out the use of sow
stalls. Thus, the current study built on Harilainen’s contemplation of spread, but
addressed the processes of spread from a wider and more holistic perspective,
showing the interactions between multiple processes and the spread through dyads,
as well as issue-based nets.

6.6.2 Diffusion of innovations (DOI)

A number of ES practices mentioned by interviewees are indeed ‘innovations,’ as
contemplated by Rogers (2003). For example, Res15 spoke of introducing iPads to
scan products received in their food distribution business and to manage the
movement of products, replacing a former paper based system. As with the DOI
literature, which found ‘relative advantage’ was a strong predictor of the rate of
adoption, the current study found the net economic benefit was important in
determining whether organisations will voluntarily implement ES practices. The DOI
literature mentioned the difficulty in diffusing preventative practices, which was
reflected in the case study data, where preventative practices were mainly spread
through legislation and joint industry/government projects, involving government coercion or assistance. Rogers (2003) suggested decision type, such as optional, collective or authority decision types, affects adoption, which resonates with the finding that legislated practices were spread more readily than voluntary practices, unless the practice had a short-term net economic benefit.

Change agents, as contemplated in the DOI literature, were clear in the data (e.g. Jamie Oliver’s television show and farm consultants). The ‘critical mass’ concept also applied to the case study data, as the whole industry decided to follow once Coles and Rivalea (important actors) decided to go sow stall free. The data illustrated opinion leaders (who are a part of the system and are able to influence other members’ attitudes), such as Coles and Rivalea, were crucial to sow stall free spread. Rogers (2003) refers to the imitation of potential adopters of their near peers, which resonates with Woolworths’ imitation of Coles’ decisions about sow stall free purchasing practices. Homophily was illustrated within organisation types, such as pig farmers, dairy farmers and manufacturers. However, the spread appeared to move from government organisations to companies, sometimes through industry representative organisations, rather than spread between companies due to homophily. Heterophilious links between homophilious cliques were found, as government organisations had relationships with various industries and assisted in spreading best practices between the industries.

The influence of the characteristics of adopters on spread was illustrated in the data, such as where early adopters of some ES practices tended to be larger organisations, often international, which are close to end consumers. In terms of the innovation decision process, many organisations, such as OrgA, OrgC and OrgD and the large supermarkets, constantly look for marketable ES practices. In terms of the ‘levels’ identified in the data, the DOI literature is most concerned with spread within a level.

6.6.3 Complexity science

The WA pork and dairy industries are complex systems made up of organisations (parts or agents). There was an overall increase in ES practices in the WA pork and dairy industries over time (i.e. spread had occurred). Also, there has been a rapid increase in sow stall free practices. These macro-level behaviours emerged from a
multitude of processes that interacted over time. The summation of the individual processes, the events within the various processes and the multiple levels within which the processes occurred do not ‘add up’ to overall macro-level behaviour. For example, why did the sow stall issue come to the fore in Australia in 2010? Why not sooner, why not later? The answer is that it was the interactions of a number of processes and influencing factors that led to this emergent behaviour.

Similarly, why have ES practices steadily increased over decades, resulting in the ‘clean and green’ reputation of Australia’s agrifood sector? This macro-level behaviour emerged over time due to multiple and interacting processes occurring in parallel and sequence over time, together with processes hindering spread and factors influencing spread. The macro-level behaviour also had an effect on micro-level behaviours. For example, the world’s interest in ES issues demonstrated by processes such as the UN conferences on climate change impacted on micro-level processes at national, state, industry, supply chain, dyadic and organisational levels.

This ‘emergent’ macro-level behaviour which cannot be explained by the sum of the parts and the feedback effects of the macro-level behaviour on micro-level behaviour are characteristics of a complex system, as discussed in section 2.6. The current study illustrated the concept of ‘emergent’ macro-level behaviour and its feedback effects suggested by complexity theory. The cases suggested individual agents were not usually aware of the larger system in which they are embedded as they usually took narrow minded, organisational or industry-specific views (Ford & McDowell 1999).

The literature review highlighted the importance of historicity and time in complex systems and the cases illustrate these aspects. For example, history played a role, as environmental legislation built on prior legislation in a slow, incremental process. Byrne (2011) suggested the consequence of the same interaction in different places and different times can have different outcomes. Thus, OrgM’s and OrgN’s financial difficulties led OrgN to increase ES practices, while OrgM adopted a minimum compliance approach. The FFF project was said by many interviewees to have been at the wrong time (i.e. the time at which the demand for ES had not yet happened), illustrating the importance of time and timing in complex systems.
As discussed in Chapter 2, Beer (1966) referred to levels of recursion (i.e. systems within systems within systems) in his Viable System Model (VSM). Espinosa and Walker (2011) applied the VSM in a sustainability context, suggesting global sustainability required each level of recursion to be comprised of sustainable systems. They suggested sustainability needs to be addressed at global, continental, national, eco-regional, town/municipality, neighbourhood/community, family/household and individual levels; recognising the borderless property of sustainability. Some processes of spread have occurred at these levels with limited success, especially at a global level (e.g. nations’ lack of agreement on carbon emission targets). The same problems, such as the public good problem experienced at the lower levels (e.g. in local communities of organisations, and in local industries) are also present at an international level, where various countries are reluctant to lead the adoption of ES practices (if such practices are not economically sustainable), as they are concerned about present and future comparative and competitive advantage.

As Espinosa and Walker (2011) argue, some ES (and sustainability) decisions have to be made at certain levels and decisions need to be made at various levels if the entire macro system is to achieve ES goals. The significance of levels of recursion here is that some decisions and processes need to occur at particular levels of recursion, so as to create an enabling environment to promote the use and spread of ES practices at other levels in an upward and downward progression. For example, laws need to be enacted at a national level, and organisations involved in setting these laws interact at this level of recursion. Other laws need to be enacted at a state level, with a network of organisations participating at this level of recursion. Some conditions need to exist at varying levels of recursion for a sustainable or viable system to emerge. Specific organisations are the link between different levels of recursion, as they are part of the network making up the various levels. For example, Woolworths interacts with other organisations at an organisational level, but also interacts with the Australian Government and industry representative organisations at a higher level of recursion. Woolworths also sits on global committees and interacts with other large global companies, which is another level of recursion. Espinosa and Walker (2011) suggested a ‘paradigm shift’ is needed regarding sustainability, which
was echoed by Res8, who felt there was a lack of ‘big picture’ thinking and integration in approaches to sustainability at various levels.

6.6.4 Supply chain management (SCM)

ES practices are not prioritised in the SCM practised by Coles and Woolworths with their Australian suppliers. However, the large supermarkets do use SCM, including auditing suppliers’ ES practices, with some non-Australian suppliers. As the Australian agrifood sector has a ‘clean and green’ reputation, it could be that the large supermarkets rely on legislation to ensure Australian suppliers use appropriate ES practices. The processors and farmers had little concern for ES practices in their SCM approaches. In contrast, the sow stall free case showed the large supermarkets’ supply chain power could be used when they want to bring about industry change. Thus, in terms of Hall’s (2000) ‘environmental supply chain dynamics’, Coles and Woolworths could improve their suppliers’ ES practices, as the supermarkets dominate the agrifood sector and their sustainability reports show they have the expertise to implement intra- and inter-organisation practices. However, there is little environmental pressure, as they are not being pressurised by Australian consumers to improve Australian suppliers’ ES credentials. In contrast, in the sow stall free case, the large supermarkets had a perceived pressure from consumers (through the enquiries received by Coles about whether their pork was produced using sow stalls) and the necessary supply chain power to bring about industry-wide change, illustrating ‘environmental supply chain dynamics’.

The green SCM practices relating to house-brand suppliers in foreign countries (with lower ES legislative requirements) illustrate a global spread process from Australia to these foreign countries. The supermarket review also showed a global spread process occurring from the head-office to operations in foreign countries in Walmart and Tesco. Supply chain contagion (McFarland et al. 2008) was illustrated in the data when the large supermarkets sought sow stall free practices, as they exerted pressure on the processors who, in turn, imitated this behaviour and exerted pressure on their suppliers. The results support Hall’s (2000) finding that companies closer to the consumer (e.g. supermarkets) experience more environmental pressure than those further from the final consumer (e.g. farmers). The supermarket review suggested the large Australian supermarkets did not assume whole-of-supply-chain responsibility,
whereas the sustainability reports of their UK and USA comparatives show more focus on accepting whole-of-supply-chain responsibility, which is an emphasis of the latest Global Reporting Initiative (GRI) series.

6.7 Discussion regarding methodology

The methodology used was an event-based approach designed to examine processes and network change, based on insights from eNPA (Halinen, Törnroos & Elo 2013) and narrative sequence analysis (Buttriss & Wilkinson 2006) techniques. Halinen et al.’s (2013) ‘double sense-making’ approach was very relevant here, as actors in various positions in the network did not show any contemplation of the ‘big picture,’ but rather their organisation’s perspective.

Flexibility was important in identifying events relevant to the processes of spread, as the significance of events sometimes only emerged upon further analysis and was not recognised when the event was originally identified, in resonance with Halinen et al.’s (2013) similar findings. The interviewees did not cite major ES ‘trigger’ events, such as ES disasters, as might have been expected from the literature review (e.g. Harilainen (2009)). It was often difficult to determine the ‘start’ of a process, as many processes had been in place for decades (such as legislation) and other processes arose sequentially after other processes. These processes were often comprised of further processes, such that the outcome of one process sometimes formed an event that was part of another process. The current study concurred with Halinen et al.’s (2013) study, as there were difficulties in distinguishing critical events from influencing factors and resulting changes.

The concept of the duration of events was seen, as the effects of past events lingered and were often part of subsequent processes. For example, the 1999 UK banning of sow stalls was influential a decade or so later when the Australian pork industry made decisions about the future use of sow stalls in 2010. The narrative sequence maps in the current study took the form of narrative tables, rather than a graphical representation of events, so as to explain the multitude of connections between events and processes, which were deemed too many to represent graphically (such as in Buttriss & Wilkinson (2004)). The classifications of events by some researchers were not deemed necessary here because the objective was not to focus on a single
process but, rather, to consider multiple interconnected processes. Makkonen et al.’s (2012) macro-level, meso-level and micro-level contextual events and focal events (the outcome of the actors’ collective actions) are incorporated in the narrative sequence tables under the column headings ‘international’, ‘national’ (cf. macro-level) and ‘industry’ (cf. meso-level), as well as in the discussion of individual organisations, such as Org M and Org N (micro-level). However, the current study has increased the number of levels contemplated. Similarly Buttriss and Wilkinson’s (2004) narrative sequence maps incorporated ‘firm’, ‘relationship/network’ and ‘environmental’ level, which is incorporated in the current study in an adapted form.

The spread of sow stall free, as it relates to a particular group of practices, was easier to analyse in terms of an ‘event trajectory’ (Halinen et al., 2013). Yet, it was apparent from the interviews that, although there were some conspicuous events with far-reaching effects that could be included in the event trajectory, such as Jamie Oliver’s television show and Coles’ declaration that it would only purchase sow stall free fresh pork, there were other underlying subtle events, such as the 1999 UK legislation banning sow stalls and the 2013 deadline for the implementation of similar legislation in the EU, which had an influence. Thus, the approach here was not to specify event trajectories but, rather, to view events holistically and allow for multiple levels of events, processes and analysis.

6.7.1 Revisiting the definition of ‘process’

As discussed, the study found the overall process of spread of ES practices in the WA pork and dairy industries arose from multiple, interacting high level or macro-processes. Each of these macro-processes arose from further multiple interacting processes, referred to as sub-processes. Returning to the definition of ‘process’ in the literature, Van de Ven (1992, p. 169) found the term ‘process’ is used to denote “a sequence of events that describes how things change over time.” The current study refers to processes arising from further processes. Pettigrew’s (1997, p. 338) definition of ‘process’ is more aligned to the findings in the current study, where process is defined as “a sequence of individual and collective events, actions, and activities unfolding over time in context.” The ‘actions’ and ‘activities’ in this definition can be interpreted to include further processes. The term ‘collective events’ in the definition also indicates further events and processes underlying the
collective events’. Buttriss and Wilkinson (2004) used the term ‘macro-events’ to refer to groups of events denoting a bigger event, again alluding to the cascading of processes found in the current study. Buttriss and Wilkinson (2006) referred to the search for ‘generative mechanisms’ in processes. The generative mechanisms could be further processes. Further, Halinen et al. (2013) spoke of the duration of the effects of events, suggesting the effects of events extend over time, which also gives them a flow or process characteristic.

Another aspect of the definition that may be explored is the idea of ‘sequence’. The current study found events and processes occurred in series (sequence) and parallel (concurrent), which would be a useful inclusion in the conceptualisation of ‘process.’ An expanded conception of ‘process’ is particularly necessary when studying processes in business network contexts, as opposed to organisational contexts, because of the multiple, interacting processes involved. This suggests an expanded conception of process is needed, such as:

A process arises from multiple, interacting sub-processes, which themselves arise from further multiple, interacting sub-processes, in an iterative progression and within context. A process can be defined as: the progression of events and sub-processes occurring in parallel and series over time and in context that assists the understanding of how a change comes about.

6.8 Addressing the research objective: To develop an understanding of the spread of environmental sustainability practices in business networks

The research objective of the current study is addressed and discussed in section 6.9.2, forming part of the theoretical contributions of the study.
6.9 Discussion of the contributions of the current study

This section discusses the contributions of the study to knowledge and theory. The preliminary contributions in section 6.9.1 are followed by the key theoretical contributions in section 6.9.2.

6.9.1 Preliminary contributions

6.9.1.1 Categorisation of processes of spread of ES practices

The study contributes a holistic categorisation of the processes of spread of ES practices in business networks, shown in Table 44, which had not been previously developed. While column C in Table 44 shows that many of the processes of spread identified in the current study had been considered previously, they had not been consolidated as in the table. For example, processes involving government intervention (e.g. S1, S2) may be found in the policymaking and public sector literature, processes S4 and S9 in the marketing literature and process S7 in the SCM literature, but have not previously been considered holistically. The classification brings together processes generally discussed previously in diverse areas.

Table 44: A categorisation of processes of spread of ES practices in business networks

<table>
<thead>
<tr>
<th>Spread number</th>
<th>Processes of spread identified in the study</th>
<th>Examples of relevant prior literature</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A)</td>
<td>(B)</td>
<td>(C)</td>
</tr>
<tr>
<td>S1</td>
<td>Enacting and enforcing environmental (and other relevant) legislation, regulations and reporting requirements.</td>
<td>(Hall 2000)</td>
</tr>
<tr>
<td>S2</td>
<td>Forming and implementing joint government/industry projects concerning ES issues.</td>
<td>(England &amp; White 2009)</td>
</tr>
<tr>
<td>S3</td>
<td>Developing and implementing voluntary agreements and reporting requirements.</td>
<td>(Othman &amp; Ameer 2009)</td>
</tr>
<tr>
<td>S4</td>
<td>Spread through consumers demanding practices.</td>
<td>(Hall 2000)</td>
</tr>
<tr>
<td>Spread number</td>
<td>Processes of spread identified in the study</td>
<td>Examples of relevant prior literature</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------------------------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>(A)</td>
<td>(B)</td>
<td>(C)</td>
</tr>
<tr>
<td>S5</td>
<td>Spread through (international) movement of staff.</td>
<td>(Andersen &amp; Skjoett-Larsen 2009)</td>
</tr>
<tr>
<td>S6</td>
<td>Spread through actors wanting to ‘do the right thing.’</td>
<td>(Hall 2000)</td>
</tr>
<tr>
<td>S7</td>
<td>Green supply chain management.</td>
<td>(Srivastava 2007; Hall 2000)</td>
</tr>
<tr>
<td>S8</td>
<td>Spread through intermediaries.</td>
<td>(Sneddon 2008)</td>
</tr>
<tr>
<td>S9</td>
<td>Spread by organisations choosing to pursue green marketing.</td>
<td>(Polonsky 2011)</td>
</tr>
<tr>
<td>S10</td>
<td>Spread due to international influence and global committees.</td>
<td>(Ritvala &amp; Salmi 2010)</td>
</tr>
<tr>
<td>S11</td>
<td>Spread through pursuit of economic sustainability.</td>
<td>(Handfield, Sroufe &amp; Walton 2005)</td>
</tr>
<tr>
<td>S12</td>
<td>Imitating.</td>
<td>(McFarland, Bloodgood &amp; Payan 2008)</td>
</tr>
<tr>
<td>S13</td>
<td>Spread through celebrity campaigns.</td>
<td>(Hall 2000)</td>
</tr>
<tr>
<td>S14</td>
<td>Spread through animal welfare campaigns.</td>
<td>(Hall 2000)</td>
</tr>
</tbody>
</table>

6.9.1.2 Categorisation of factors influencing spread of ES practices

The current study provides a categorisation of factors influencing the spread of ES practices, adding to previous factors discussed in the green SCM literature (e.g. Hall 2000). These factors were summarised in Table 40 and Table 41. These factors are not limited to organisational and supply chain level aspects affecting adoption and spread of ES, as prevalent in much prior research (Zhu & Sarkis 2006; Hall 2000). The factors include higher level issues, such as the existence of different rules in different countries and the issue of public goods. Thus, the study contributed a multiple level consideration of the factors influencing spread.
6.9.1.3 Categorisation of characteristics of ES practices affecting their spread

The current study also provides a comprehensive categorisation of the characteristics of ES practices influencing their spread. This adds to previous categorisations in the literature, such as Rogers’ (2003) categorisation of the characteristics of innovations that affect their diffusion. The categorisation is shown in Table 45.

Table 45: Categorisations of characteristics of ES practices influencing spread

<table>
<thead>
<tr>
<th>(A)</th>
<th>Characteristics of ES practices</th>
<th>Prior examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Legislated versus voluntary</td>
<td>(Hall 2000)</td>
</tr>
<tr>
<td>b</td>
<td>Short-term versus long-term (or no) economic benefits.</td>
<td>(Drury 2008)</td>
</tr>
<tr>
<td>c</td>
<td>Preventative, appraisal, internal failure and external failure practices.</td>
<td>(Drury 2008)</td>
</tr>
<tr>
<td>d</td>
<td>Strategic versus reactive.</td>
<td>(Krause, Handfield &amp; Scannell 1998)</td>
</tr>
<tr>
<td>e</td>
<td>Independent versus cooperative.</td>
<td>(Håkansson et al. 2009)</td>
</tr>
<tr>
<td>f</td>
<td>Easy versus complex.</td>
<td>(Hall 2000; Rogers 2003)</td>
</tr>
<tr>
<td>g</td>
<td>Practices that attract public attention versus practices not necessarily seen by the public; marketable versus non-marketable.</td>
<td>(Greenwashingindex.com 2012; Hall 2000)</td>
</tr>
<tr>
<td>h</td>
<td>Relative advantage (economic profitability, low initial cost, a decrease in discomfort, social prestige, a saving of time and effort, and immediacy of reward).</td>
<td>(Rogers 2003)</td>
</tr>
<tr>
<td>i</td>
<td>Compatibility.</td>
<td>(Rogers 2003)</td>
</tr>
<tr>
<td>j</td>
<td>Trialability.</td>
<td>(Rogers 2003)</td>
</tr>
<tr>
<td>k</td>
<td>Observability.</td>
<td>(Rogers 2003)</td>
</tr>
<tr>
<td>l</td>
<td>Difficulty or intensity of ES practices.</td>
<td>(Sanchez-Rodriguez, Hemsworth &amp; Martinez-Lorente 2005)</td>
</tr>
<tr>
<td>m</td>
<td>Intra-organisation versus inter-organisation ES practices.</td>
<td>(Srivastava 2007)</td>
</tr>
<tr>
<td>(A)</td>
<td>Characteristics of ES practices</td>
<td>Prior examples</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>n</td>
<td>Piecemeal / project based environmental practices versus whole of system environmental management.</td>
<td>(Lee 2010).</td>
</tr>
<tr>
<td>p</td>
<td>Practices that can versus cannot be delayed.</td>
<td></td>
</tr>
</tbody>
</table>

Table 45 assimilates former theories from diverse disciplines (examples of relevant literature are shown in column C), offering an inter-disciplinary approach. For example, the categorisation integrates research in the areas of economics (e.g. item ‘o’), diffusion of innovations (‘h’, ‘i’, ‘j’, ‘k’), quality control (item ‘c’), SCM (items ‘d’, ‘e’, ‘f’, ‘m’, ‘n’) and green marketing (item ‘g’). Item ‘o’ is a contribution of the current study.

6.9.1.4 Ten year supermarket review

The study provided a ten year review of the sustainability reports of the largest Australian supermarkets (Coles and Woolworths), the largest UK supermarkets (Tesco and Sainsbury) and the largest supermarket in the world, Walmart (USA). The focus is on the trends in their intra- and inter-organisation ES practices and their approaches to ‘whole-of-supply-chain’ management. This comparison has not been done previously and contributed an evaluation of differences between countries. For example, the UK and USA supermarkets articulated a ‘whole-of-supply-chain’ approach to sustainability (as advocated by the GRI 4 series), whereas the Australian supermarkets did not articulate such responsibility in their reports.

6.9.1.5 Application of narrative sequence analysis and eNPA techniques

The study provided empirical data and illustrated the application of narrative sequence analysis (Buttriss & Wilkinson 2004, 2006) and eNPA (Halinen, Törnroos & Elo 2013) techniques in a network context. This contributed to the scarce research that has applied these techniques in network contexts and adds to the discussion of the difficulties and intricacies of conducting process research in a network.
environment. The study differs from previous studies using these analysis techniques by considering higher level processes, whereas much prior research deals with processes at a more micro-level.

The study provides an alternative way to organise and display the data concerning multiple processes in a network environment, adding to the graphical displays, such as the global narrative maps used by Buttriss and Wilkinson (2004) and event trajectory used by Halinen et al. (2013). Examples of the data organisation are found in Case A1, where events were tabulated over time at various levels (international, Australian, WA and industry level) in Table 21. These events (using a grid reference from Table 21), together with other evidence, were then tabulated in Table 22, which summarised the relevant events and examples of sub-processes for each macro-process, together with other evidence, such as quotes from the interviews. While prior displays might be preferred when the number of events is small enough to display their interconnections, the tables used here suited a study in which the number of events, processes and interactions were too numerous to display graphically and needed to be narrated.

6.9.2 Theoretical contributions

6.9.2.1 Contribution of an expanded conceptualisation of process

The study contributed an expanded conceptualisation of process, which is particularly useful when studying processes in business networks. It seems a process arises from multiple, interacting sub-processes that, themselves, arise from further multiple, interacting sub-processes, in an iterative progression and within context. This was referred to as ‘cascading of processes’ and is represented graphically in Figure 15, which shows the multiple interacting processes giving rise to higher level processes and vice versa.

The various processes are depicted as a wave icon, resonating with the flow nature of processes. The triple circular arrows indicate an interaction between the processes and between the processes and the influencing factors. As seen in Figure 15, the overall process of interest (S1) arose from multiple and interacting processes (S1.1, S1.2 and S1.3). Each of these processes arose in turn from multiple interacting processes. For example, process S1.1 arose from the interaction of processes S1.1.1
and S1.1.2. Process S1.1.1 in turn arose from process S1.1.1a. This iterative progression can continue until a desired level of detail and simplification of the processes is reached. Similarly, following the processes upward, sub-processes can be accumulated into macro-processes that are, again, accumulated into higher processes, until a desired level of aggregation is reached. An ability to understand higher and lower level processes is important when dealing with concepts such as environmental sustainability, which are borderless.

In addition, every process, at any level, has the potential to interact with every other process, at the same or other level, as illustrated using the triple arrow icon denoted as ‘overall’ (the use of further arrows is avoided since the potential interactions are too numerous). Also, an event and/or process may form part of multiple processes.

![Figure 15: Cascading multiple interacting processes](image)

Each of the processes shown in Figure 15 can be represented graphically, as in Figure 16, which depicts the expanded conceptualisation of the definition of process. Here, a **process** is defined as:

The progression of events and sub-processes occurring in parallel and series over time and in context that assists the understanding of how a change comes about.

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Figure 16 depicts the events and sub-processes as squares. The y-axis shows the levels at which the events and sub-processes occur, while the x-axis shows the passage of time. The triple arrow icon indicates interactions between the events and sub-processes that give rise to the process being described. The figure shows events and sub-processes may occur in series and parallel over time.

![Diagram showing interacting events and sub-processes](image-url)

**Figure 16: Multiple interacting events and sub-processes making up a process**

This idea of cascading processes bears resemblance to the idea of ‘recursion’ in complexity theory, where systems are seen to be made up of systems that are made up of systems and so on (Espinosa & Walker 2011). This study suggests processes that interact can lead to emergent higher level processes, in which macro-behaviour is not predictable from the underlying processes. This concept of the emergence of higher level processes/behaviours that are not equal to the sum of the underlying parts (processes) resonates with the complex systems characteristic of ‘emergence’ (Mitleton-Kelly 2003). The emergence of higher order unpredictable behaviours also resonates with the unpredictable ‘network effects’ contemplated in the IMP literature (Håkansson & Snehota 1995). The ‘cascading processes’ concept adds to the literature investigating the mechanisms and processes of change in networks (Buttriss & Wilkinson 2014).
This study explored processes and interactions between processes. While parallel processes and interactions between processes have been discussed in some prior literature (Halinen, Medlin & Törnroos 2012), the current study provided empirical data illustrating these features. The focus here was on both macro-level processes and lower level processes, whereas much of the previous research focused on the micro-level processes occurring at the bottom of a cascade of processes (Halinen, Törnroos & Elo 2013; Makkonen, Aarikka-Stenroos & Olkkonen 2012; Buttriss & Wilkinson 2004).

6.9.2.2 Contribution to ‘levels’

The current study expanded the conceptualisations of ‘levels’ in conducting process research in business networks. Prior literature considered levels of context and analysis (Makkonen, Aarikka-Stenroos & Olkkonen 2012; Halinen, Törnroos & Elo 2013; Buttriss & Wilkinson 2004) and its influence on network change. As ES is a borderless concept, the current study suggested the spread of ES practices could be analysed at multiple levels, such as international, national, state, industry, supply chain, dyadic and organisational levels, as shown in Figure 17. Addressing ES issues at various ‘levels’ also resonates with the levels of recursive organisation suggested by Espinosa and Walker (2011).

The study found it was useful to analyse the levels at which events and processes occur. These levels emerged from the data. The factors influencing the processes of spread can also be analysed at these levels. The study showed the processes of spread of ES practices occur at various levels and some processes connect these levels. The study showed processes at a level can influence processes occurring at higher and lower levels. Some actors only interacted at lower levels (e.g. organisational, dyadic and supply chain levels), whereas other actors interacted on multiple levels (e.g. Woolworths interacted at all the levels in Figure 17). The embeddedness (or relationships) of actors impacted on their ability to influence the processes of spread at the various levels.
6.9.2.3 Contribution to the issue-based net literature

The study offered many empirical illustrations of the formation and operation of issue-based nets, contributing to the scarce literature on the topic. The case study settings (pork and dairy industries) and issues (ES and animal welfare issues) differed from those investigated previously, such as excess stocks in the Portugal port wine industry (Brito 1999) and environmental issues in the Baltic Sea (Ritvala & Salmi 2010, 2011). The current study provided data on successful (e.g. the phasing out of sow stalls in Australia) and unsuccessful (e.g. the Farming for the Future project) issue-based nets, together with influencing factors. The investigation of an unsuccessful issue-based net (the Farming for the Future project) is unique, as prior research has not discussed the formation and operation of unsuccessful issue-based nets. This contributed to theory in the development of success factors for issue-based nets.
The current study not only considered the formation and operation of issue-based nets, but also the positioning of these nets within a wider context of other processes of spread that occur simultaneously, prior to and subsequent to the formation of the issue-based net; links which have not been made previously. For example, prior processes (e.g. the UK sow stall free processes and Jamie Oliver’s television show impacting on Australian consumers), concurrent processes (e.g. processes occurring in the UK to ensure imported pork met new EU sow stall free regulations) and subsequent processes (e.g. the use of SCM by Coles and Woolworths to spread the phasing out of sow stalls after the voluntary industry agreement to phase out sow stalls) influenced issue-based net formation.

In this study, the formation and operation of the issue-based nets was identified as a process of spread of practices. Thus the study contributed a ‘process approach’ to the investigation of the formation and operation of issue-based nets that had not been used previously. Further, the conceptualisation of issue-based nets was extended by suggesting issue-based nets are made up of multiple, more narrowly focused issue-based nets, such as the FFF project being made up of FFF issue-based nets in each WA industry.

The study also contributes a graphical representation (shown in Figure 16) of the positioning of issue-based nets in spread. The figure shows two issue-based nets that may occur concurrently or sequentially over time. Figure 18 shows the interactions within issue-based net 1 (depicted as a large circle encompassing organisations B, C, D, E, F, and M). These interactions (depicted by the triple arrow icon) are beyond dyadic and represent synergistic, interactive effects resulting from the issue-based net.

Within the issue-based nets there are often a small group of organisations with a special interest in the issue, as well as the capabilities and resources to mobilise the net. For example, in the sow stall free issue-based net, Coles, Rivalea (and later Woolworths) were important actors and promoters. On the other hand, Government agencies played important roles in the ES issue-based nets formed to develop industry-specific regulations and guidelines.
Figure 18 shows spread can start with dyadic interactions, such as within the A-B dyad, which may motivate organisation B to bring together an issue-based net with the assistance of a small number of other actors. The outcomes (e.g. changes in practices) of the issue-based net may then spread further to other issue-based nets (such as issue-based net 2) over time or along dyadic chains, such as F-G, G-I and E-H. The outcomes arising from the operations of the issue-based net can affect further actors in the network, such as dyad L-K, through, for example, imitation processes.

Figure 18: Spread of change incorporating issue-based nets

Figure 18 incorporates the sentiment of Brito’s (2001) three dimensional model of business networks, in which he incorporates collective actors operating at a level above a traditional business network. Some actors may be members of two issue-based nets; in which case the large circles will overlap. The figure shows issue-based nets can interact and issue-based nets can interact with individual actors and dyads. The study suggested the results of an issue-based net (such as a change in practices)
were sometimes confined to the members of the net (such as the FFF project, where on-farm changes were confined to the pilot farms in the project). However, at other times, the changes arising from a net became widespread in the network (such as the spread of the resolution of the sow stall free issue-based net).

The spread through issue-based nets depicted in Figure 18 works alongside and adds to the conceptualisations of spread through interactions in dyadic relationships, as contemplated by the ARA model in the propagation of changes in a network, as well as Harilainen’s (2009) contemplation of the spread of CSR practices. This dyadic spread is illustrated in Figure 19, where, for example, dyad A-B may interact and change their ES practices, leading to similar changes in the B-D and B-C dyads.

Thereafter, further propagation may occur along the dyadic chain through interactions between C-F, F-G and G-I dyads. At the same time, a chain of changes may occur through dyadic interactions by C-E and E-H. These reflect spread through direct interactions. Spread through indirect interactions may occur when competitor K imitates B and spreads these changes in its interactions with L.

![Figure 19: Spread of change through dyadic relationships](image)
6.9.2.4 Contribution of empirically-based extensions to the initial conceptual framework and a proposed empirically informed framework for the spread of ES practices in business networks

The interactions between processes of spread, as envisaged in the initial framework, has been extended through the ‘cascading processes’ conceptualisations shown in Figure 15. The initial definition of process has been extended, as was described in section 6.7.1. The initial conception of dyadic and group types of processes of spread was extended to include the ‘one-to-many’ type of process shown in Figure 13. Farm consultants and celebrities were found to be important change agents; extending the change agents suggested in the initial framework (i.e. government departments and industry representative organisations). The lack of green SCM by large Australian supermarkets with Australian suppliers of branded products and the lack of a whole-of-supply-chain approach updated the initial framework’s expectations. The concept of trigger events was not supported by the data, which was not in line with the initial framework, in which trigger events were regarded as key to the processes of spread. An additional characteristic of ES practices affecting spread was identified in the data (practices that can and cannot be delayed), extending the initial conceptual framework. Based on these extensions, the empirically informed revised framework is summarised in the next section.

Proposed empirically informed framework governing the spread of ES practices in business network

Spread occurs though multiple, interacting processes that may occur concurrently or sequentially over time. Fourteen macro-processes of spread were identified, each emerging from multiple, interacting sub-processes. Each sub-process emerged from further multiple interacting processes, referred to as ‘cascading processes’. The most important macro-process of spread was decades of enacting and enforcing environmental legislation. The processes of spread operate at various levels of aggregation (e.g. dyadic, supply chain, industry, state, national and international levels). The spread processes identified may operate horizontally across levels and/or vertically between levels. The processes of spread occur through dyadic, group and/or one-to-many interactions, as was shown in Figure 13.
Government played an important role in ES spread due to their public good market aspects. Government departments, industry representative organisations, farm consultants and celebrities also played important roles as change agents. Green SCM relating to Australian suppliers of branded goods and a whole-of-supply-chain approach did not seem to be prioritised by the large Australian supermarkets, which had knock-on effects for the rest of the supply chain.

The processes of spread were affected by the sea of context that surrounds organisations, supply chains, industries, countries and the world (i.e. the conditions that directly or indirectly affect the units of interest). The sea of context influences the processes of spread but, in turn, the processes of spread influence the sea of context. The structure of the network also affects spread processes. Further, the characteristics of the practices themselves affect spread.

6.10 Chapter summary

Chapter 6 discussed the results in Chapter 4 and Chapter 5 in terms of the literature reviewed in Chapter 2 and the initial conceptual framework. The discussion included cross-case comparisons between the three case studies. The research questions and objectives were addressed and the contributions of the study outlined. Next, Chapter 7 provides concluding comments and areas for further research.
CHAPTER 7 - CONCLUSION

7.1 Introduction

This Chapter summarises the contributions of the current study, together with its strengths and limitations. The managerial and policy implications are discussed, as are areas for further research.

7.2 Contribution to knowledge and theory

The current study contributed a number of preliminary and theoretical level contributions (as discussed in section 6.9). First, the study provided a holistic categorisation of the processes of spread of ES practices in business networks, the factors influencing the spread of ES practices and characteristics of ES practices affecting their spread. These comprehensive categorisations consolidated and added to a previously disaggregated literature. Second, the study contributed a ten year review of the sustainability reports of the large Australian supermarkets (Coles and Woolworths) and their UK and USA comparatives, which had not been previously undertaken. Third, the study offered an application of the event-based approach to process research in business networks, contributing data and further insights into narrative sequence analysis and eNPA techniques.

A number of theoretical level contributions were also made. First, the study extended the conceptualisation of ‘process’ in business networks by providing an expanded definition of ‘process’ and submitting the idea of upward and downward ‘cascading’ of multiple, interacting processes. This added to prior network process and network change research. Next, the current study contributed to the concept of ‘levels’ in the study of processes (Makkonen, Aarikka-Stenroos & Olkkonen 2012; Halinen, Törnroos & Elo 2013; Buttriss & Wilkinson 2004). The study suggested the spread of ES practices can be analysed at multiple levels of aggregation (e.g. international, national, state, industry, supply chain, dyadic and organisational levels), resonating with the levels of recursive organisation suggested by Espinosa and Walker (2011) when applying complexity theory to sustainability. The study added to the scarce ‘issue-based net’ literature by considering interactions between issue-based nets, the positioning of issue-based nets in the context of other processes and the investigation of unsuccessful issue-based nets. Finally, the study contributed an empirically
informed framework for understanding the spread of ES practices in business networks.

7.3 Strengths of the current study

The current study uses multiple types of data (e.g. interviews and documents such as sustainability reports), which allowed for triangulation of the data. The study accessed data from multiple actor types (e.g. farmers, processors, retailers and government departments), which allowed for the development of a multi-actor perspective of the processes of spread. The study considered the processes of spread and events at multiple levels, which allows for the identification of macro- and micro-processes of spread, which is especially important in relation to the borderless concept of ES. The results were strengthened by conducting three case studies, which allowed for cross-case comparisons across industries (pork and dairy) and across practice types (ES practices and animal welfare practices). Literature from multiple disciplines was consulted, which helped the development of a holistic, cross-disciplinary approach.

7.4 Limitations of the current study

The scientific literature relating to sustainability, such as the scientific effectiveness of various sustainability practices, was deemed beyond the scope of this study and was not included in the review. The study was limited to interactions between organisations and did not include intra-organisation interactions relevant to the processes of spread of ES practices. In the case studies, international actors, such as foreign suppliers and buyers of pork, were not interviewed, as resources were not available. This would have added further insights into international processes of spread. The specification of prevalence levels of processes as high, medium or low (e.g. in Table 39) was subjective and depended on the organisations included in the study. However, the assignment of prevalence levels was seen as a useful indication of the use made of the process by the various actors, such as farmers, processors and retailers.

These results may not apply to other industries and other countries, especially given the importance international, Australian, WA, industry and organisational aspects had on the processes of spread. Further, the particular combination of interacting
processes (in series and parallel) and influencing factors are unlikely to be replicated in other times, industries and countries. Thus, the same results are unlikely to re-occur. Also, while a range of perspectives are included, the study did not include perspectives from all possible actors. Nevertheless, the study did include the actors that the double sense-making process deemed most important to the processes of spread. Further, spread occurred over time and, although evidence was gathered that incorporated time (e.g. 10 year sustainability report review), interviews were conducted in a cross-section of time and perceptions may vary with changes in time.

7.5 Managerial and policy implications

7.5.1 Implications for government policymakers

The study highlighted the necessity of well-designed and well-enforced environmental legislation, regulations and reporting requirements in spreading ES practices, in particular those associated with the provision of public goods. The study showed the benefit of developing industry-specific (e.g. pork and dairy) and organisation-type specific (e.g. farmers, processors or retailers) legislation and regulations. The study also illustrated how legislation can decimate an industry (e.g. the banning of sow stalls in the UK in 1999), which serves as a warning for policies considered in isolation rather than in relation to policies in other States and countries.

The study suggests the use of cooperative (e.g. joint government/industry ES projects) and coercive (e.g. fines or shutting down a business if not compliant) techniques in managing the spread of ES practices. The importance of framing ES practices to target organisations using business arguments, rather than promoting these practices purely on environmental grounds, was highlighted in the Greener Pastures project. The importance of gaining the support and participation of intermediaries, such as farm consultants, was also made clear. The study showed how Australian Government funding can direct ES projects, which can be a useful tool. The lack of consumer demand for ES practices (e.g. in the Farming for the Future Project) could be addressed through social marketing.

The benefits of using a multi-process approach to the spread of ES practices was illustrated, as processes can interact and give rise to higher level processes that amount to more than the summation of the sub-processes. These multiple processes
can target specific ES issues, organisation types and industries. The use of multiple processes targeting various organisational groups, such as farmers, processors and retailers, is beneficial to ensure a more extensive spread of ES practices to organisations in various network and supply chain positions. While suggesting the use of multiple, tailored processes of spread, an integrated and holistic perspective is needed to avoid unintended consequences and processes which mitigate each other. Local and State Government in WA could interact more concerning ES issues. This study also offered government policymakers a better understanding of the positioning of their processes of spread in relation to the other processes of spread, such as through green SCM.

7.5.2 Implications for industry representative organisations

The study illustrated the benefit of industry representative organisations participating in joint government/industry projects to increase communication and the efficient application of ES practices, such as the development of industry-specific ES regulations. The need for industry representative organisations to adapt to industry structure to ensure the spread of ES practices is illustrated in the cases. For example, the large number of dairy farmers and regionalised climatic and cultural factors have led to Dairy Australia’s regionalised structure. Dairy Australia has also recognised the need to include farm consultants in the delivery of ES projects to extend the reach of these projects and achieve greater engagement by farmers. The importance of industry representative organisations keeping up-to-date with international best practice, as well as practices that have failed elsewhere, was also illustrated in the study.

7.5.3 Implications for managers of organisations

The study highlighted the need for managers to remain up-to-date with ES legislation and reporting requirements to ensure compliance, avoid fines or the shutting down of operations. A continuous improvement approach to ES issues is suggested, in which ES practices with simultaneous economic benefits are pursued, after ensuring compliance with ES practices required by legislation and reporting requirements. Remaining aware of ES assistance (such as funding and technical assistance) offered by the State and Australian Governments is also suggested, since this may tip the net
benefit versus cost of implementing ES practices. Interacting with similar organisations, industry representative organisations and government departments regarding ES issues can lead to synergistic outcomes for participants (such as experienced in joint government/industry projects) and bring government funding opportunities to the attention of organisations.

The high costs associated with delaying ES practices was illustrated, such as a need to remediate contaminated land before it can be sold and environmental audits conducted on the sale of a business; suggesting managers avoid delaying tactics. The potential use of environmental issue-based nets to reduce the individual costs associated with increased ES practices was highlighted, together with the factors important for successful outcomes of issue-based nets. The manner in which issue-based net mobilisers or project coordinators frame an issue to target organisations was shown to be important.

7.6 Areas for further research

The processes of spread identified could be tested in other industries and countries. The prevalence of such practices among organisation types (e.g. farmers, processors and retailers) could also be investigated statistically. The prevalence of such processes could also be ranked and it could be seen if these rankings change over time.

The factors influencing spread could be investigated further quantitatively. Further research should investigate how ES practices’ characteristics affect spread in more detail. The characteristics of ES practices influencing spread can be investigated further using quantitative techniques to understand their prevalence and the interactions between their characteristics in various industries and countries. Also, the influence of the characteristics and combinations of characteristics of ES practices on spread could be investigated further, as could the processes and factors hindering the spread of ES practices.

Another area for further research is a more detailed empirical study of the use, formation and success factors of issue-based nets. The way in which collective action through issue-based nets can change the cost versus benefit structure for an individual organisation to participate in the provision of a ‘public good’ can also be
investigated further. A further possibility is the use of an agent-based model to simulate the spread of ES practices in a business network, in which the conditions surrounding individual organisations, dyads and networks could be specified and decision criteria for organisations set. This would allow for simulations of various depths and breadths of spread, depending on the specified conditions and decision criteria.

Other case studies could be conducted comparing the spread of animal welfare practices as a group and ES practices as a group. Also, case studies investigating the spread of ES practices in WA industries unrelated to agrifood, such as mining, could be conducted and the results compared to the current study results. Further research should review the global food industry literature to find further relevant events and international factors affecting spread.

7.7 Closing remarks

The current study highlighted the fact that consideration of ES and other sustainability issues is becoming an unavoidable aspect of doing business. This sentiment was succinctly articulated by the chairman of the Tesco (UK supermarket) Board, when he said:

“Corporate responsibility is neither new nor optional. It reflects the inescapable reality that, if the values of a business fail to resonate with the values of the society in which it operates, it is endangering its own long-term prosperity. Customers will simply go elsewhere” (Tesco 2013, p. 3).

At the same time, organisations struggling with economic sustainability grapple with the reality that “it is hard to be green when you are in the red” (Res19 citing a WA farmer). It is hoped a multi-process approach to spreading ES practices in business networks will contribute to the emergence of an overall improvement in the global spread of ES practices, with its resulting long-term benefits.
Appendix A: Interview protocol

The Spread of Environmental Sustainability Practices in Business Networks

This interview protocol is to be used by the interviewer as a prompt during semi-structured interviews.

1) Before we begin, may I record this interview so that I can transcribe it and send a copy of the transcription back to you?

2) This is an explanation of my study and about the fact that your interview information will be kept confidential. Will you please sign when you have read it?

3) Can you please tell me the story of how your company started “going green” and considering/implementing environmental sustainability (ES) practices? (Explain to the interviewee what is meant by “going green” and environmental sustainability i.e. engaging in activities which aim at improving the impact on the environment, for example improving water consumption, greenhouse gas emissions, waste management etc.)

4) Can you please describe any major events / milestones / turning points that stand out in your mind as far as your ES history is concerned? For example, a new law, government assistance?

5) Why did your company decide to implement ES practices?
   If interviewee does not mention the following, then ask about it.
   (1) Laws and regulations
   (2) Pending laws and regulations
   (3) Environmental disasters
   (4) International influence
   (5) Exemplary companies
   (6) Pressure from consumer groups and activists
   (7) Pressure from buyers
   (8) Pressure from suppliers
   (9) Good marketing
   (10) Cost savings
   (11) Improve reputation
   (12) Need to certify (e.g. ISO 14001)
   (13) Implementing environmental management system

6) Can you please explain the main problems in trying to implement ES practices? (e.g. cost, lack of consumer demand, trade-offs with other competing priorities, lack of knowledge and expertise, lack of commitment at various organisational levels, going back to old ways of doing things, too much paperwork and admin, laws and regulations not enforced).

7) Can you please describe the conditions that would be necessary for you to adopt ES practices? (e.g. top management support, market demand for ES products and processes, cost effectiveness, sufficient expertise etc.)

8) Can you please describe the conditions that would be necessary for you to spread ES practices? (e.g. sufficient expertise, power in relationships or collaborative relationships etc.)

9) Which of the following organisations (competitors, government organisations, consumer advocacy groups, suppliers, supplier’s suppliers, customers, customer’s customers, trade organisations):
i) Influenced your decisions concerning ES practices
ii) Influenced your implementation of ES practices
iii) Why and how was this done?

10) Who of the above organisations has the most to gain and who is bearing the costs of implementing ES practices?

11) How are ES practices being spread between organisations?
   (If prompt needed: then ask whether through coercion, cooperation, imitation, supplier development practices, ES marketing?)

12) Have you found that different practices spread differently? Please can you give me some examples.
   e.g.
   (1) Legally required versus voluntary
   (2) Short-term versus long-term economic benefits
   (3) Preventative, appraisal, internal failure and external failure practices
   (4) Strategic versus reactive
   (5) Independent versus cooperative
   (6) Low cost versus high cost
   (7) Easy versus complex to implement
   (8) Practices which attract public attention versus practices not necessarily seen by the public

13) Can you recall an example where certain practices spread together e.g. training of supplier staff and implementing a few ES practices such as employee ES suggestion boxes?

14) Can you please give me a detailed example of where you spread a ES practice (who was involved, triggers, necessary conditions, processes of spread)

15) Can you please give me a detailed example of where a ES practice was spread to you? (who was involved, triggers, necessary conditions, processes of spread)

16) Organisation details (only ask if these answers were not given in answering other questions):
   (1) How large are you? (e.g. turnover)
   (2) What are your main products?
   (3) Who are your main suppliers?
   (4) Who are your main customers?
   (5) Who are your main competitors?
   (6) Which government organisations influence your business?
   (7) Which trade organisations do you interact with?
   (8) Which customer groups or activists influence your business?
   (9) How is your business owned – owner managed, major shareholders?
   (10) Power in relationships (suppliers, customers etc.) – who holds the power generally? Is it same for ES aspects?

17) Do you have any recommendations of other individuals/organisations that I should speak to?

18) Can I speak to …… whom you mentioned earlier? May I have a contact?

Thank you for participating!
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Res2 2012, Director, DAFWA.

Res3 2012, Development officer, DAFWA.

Res5 2012, Leader, DAFWA

Res6 2013, Farm consultant, previously DAFWA officer

Res7 2013, 'Director, DEC'.

Res8 2013, 'Manager, DEC'.

Res9 2013, 'Executive, WALGA'.

Res10 2013, 'Executive Manager, WALGA'.

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Res11 2012, Agro-economic consultant/ AAAC.

Res12 2013, 'Director, Western Australia Farmers' Federation'.

Res15 2012, 'CEO, Food service and distribution'.

Res16 2012, General manager division, Food service and distribution.

Res17 2012, Manager, Food service and distribution.

Res18 2012, Logistics provider, recycling.

Res19 2012, Uni lecturer and DAFWA researcher.

Res21 2012, Officer, DAFWA

Res22 2012, Director, DAFWA

Res23 2012, Executive, WAPPA.

Res24 2012, General manager division, large agrigroup. Executive board member, National industry organisation.

Res25 2012, Owner manager, Butcher.

Res26 2013, 'Manager, Butchery'.

Res27 2012, Executive Director, large agrigroup.

Res28 2012, General manager division, food manufacturer.

Res29 2013, 'Manager, DAFWA'.

Res30 2013, 'Manager, Dairy Australia'.

Res31 2013, 'Co-ordinator, Western Dairy'.

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