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Factors Affecting Green Supply Chain Management in the New Zealand Food and Beverage Sector

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ABSTRACT
Using a grounded theory approach, this paper extracts emerging concepts in the implementation of Green Supply Chain Management from case data of New Zealand food and beverage (F&B) companies. In search of factors that may lead to theory-building, the study relates case studies in fruit and vegetable, juice, and dairy product companies through in-depth interviews with ranking general and line managers. We find the outline of a theoretical framework focusing on strategic and operational planning; management structure, systems, and decision-making; management of people and company culture; and relationships with supply-chain members.

KEYWORDS
Green supply chain management, green policy, sustainability, supply chain management

INTRODUCTION
Supply chains are the essential connections between a firm’s inputs and outputs. Firms have always been challenged to lower costs of their supply chain, to ensure just-in-time delivery, and to economise on time to market—usually without any thought of sustainability. Yet increasingly and for varied reasons, some businesses are moving to protect the environment (Zhu et al., 2008a, Sarkis, 2003, Rezaee and Elam, 2000, Reinhardt, 1998, Rao, 2007, Piplani et al., 2008, Markley and Davis, 2007a, Mahler, 2007, Geyer and Jackson, 2004, Business for Social Responsibility, 2001, Basu and Wright, 2008). The main drivers seem to be efficiency gains, waste reduction, risk avoidance, out-distancing regulations, new product opportunities, consumer demand for eco-friendly products, and cost control. Yet even this is changing. While these abovementioned motivations may have once been important, some authors believe that they are becoming irrelevant against the dire need to deal with the environmental and social consequences of climate change (e.g. (Corbett and Klassen, 2006, Kleindorfer et al., 2005).

Green Supply Chain Management (GSCM) refers to ways in which innovations and policies in supply chain management respond to the need for a more sustainable environment (Srivastava, 2007). GSCM aims to find ways to ameliorate negative impacts on the environment and, at the same time, to save costs, improve efficiency, increase profits, and generate consumer awareness (Rao, 2007, Srivastava, 2007, Jackson and Clift, 1998).

While many authors have explored the linkage between best practice in environmental and supply change management, theory-building is just beginning in this field and case studies
can help create testable propositions. A recent study by Pagell and Wu (2009) claimed that “no coherent set of practices in sustainable supply chain management has emerged”, and this led them to pick ten cases of exemplar firms in different sectors to build a new model. This paper follows a similar practice in selecting cases in order to extract testable hypotheses for future studies.

This paper examines factors that are important in implementing GSCM practices within the Food and Beverage (F&B) industry in New Zealand. The primary research question is: What operational factors (or constructs) can be extracted from these case data that lend themselves to theorising about implementing Green Supply Chain Management?

LITERATURE REVIEW


Penfield (2009 cited in , Byrne, 2007) obtusely defines GSCM as ‘the process of using environmentally-friendly inputs and transforming these inputs through change agents—whose by-products can improve or be recycled within the existing environment ... develop[ing] outputs that can be reclaimed and re-used at the end of their life-cycle’. Hervani, Helms and Sarkis (2005) define it simply as green purchasing, green manufacturing/materials management, green distribution/marketing and reverse logistics. After reviewing the debate, and because it fit our analytic framework, the present authors favoured a definition of Kogg (2003) that GSCM is ‘the set of supply chain management policies held, actions taken and relationships formed in response to concerns related to the natural environment with regard to the design, acquisition, production, distribution, use, re-use and disposal of the firm’s goods and services’.
In this paper we examine what drives managers to adopt GSCM, especially when confronted with restraining factors. One sees that short literature that provides diverse answers. Based upon the review, our initial view was that these factors would relate to management buy-in, implementation barriers, decision-making and execution. Our goal was to focus on general managers or line managers and to reveal factors that enhance or inhibit GCSM.

METHOD

Testa and Iraldo (Testa and Iraldo) have criticized the use of GSCM case studies in geographical areas and industrial branches. Other such as Soler et al. (Soler et al.) have recently used the technique we employed. But, drawing upon Eisenhardt and Graebner (2007), we reflected on how best to extract factors and constructs that in this instance might lead to meso-level theory from case-based evidence. Our goal was to compile and organise these constructs in a way that could advanced future theory-building using an inductive approach. The multiple case approach provides a more justifiable platform for theory-building (Yin, 1994). Following van Maanen (1983), we sought “to describe, decode, translate and otherwise come to terms with the meaning, not the frequency, of certain more or less naturally occurring phenomena in the social world”.

A grounded theory approach thus represented the most suitable methodology for this study due to the nature of the research problem itself. Our aim was to generate constructs that might lend themselves to a testable model of green supply chain adoption and behaviour. Glaser and Strauss (1967) defined the grounded theory approach thusly: “Generating a theory from data means that most hypotheses and concepts not only come from the data, but are systematically worked out in relation to the data during the course of the research”. Grounded theory allows the researcher to be more attentive to how “subjective experiences can be abstracted into theoretical statements about causal relationships between actors” (Suddaby, 2006). In this way, theory “emerges” directly and rigorously out of the data and is returned to the data for verification (Glaser, 1992). In this study, we define constructs, locate indicators, and develop propositions about green supply chain management using a grounded theory approach.

The relation of these emerging patterns to veracity depends on the representativeness of respondents and the chosen cases themselves. One must caution against what Eisenhardt and Graebner (2007) call ‘impression management’ by image-conscious respondents. To the extent that we were able, in a small sector in a small country, we diversified our data sources by management role, firm size, and product type, all however within one industrial sector. This research used nine semi-structured interviews as well as copious amounts of secondary
sources such as institutional documents and websites, government policy documents, and news reports. Using NVivo software and the procedure of Dey (1999), we conducted open coding to categorize, then axial coding to disaggregate the themes, and finally selective coding to integrate the themes at a higher level of abstraction.

Our choice of three New Zealand Food and Beverage (F&B) came from four reasons: (1) Food and beverage manufacturers and distributors globally have been at the forefront of environmental efforts (Deloitte Touche Tohmatsu and Grocery Manufacturers Association, 2009) (Palmer, 2009), and thus may serve as foundations for general theory-building in this arena. (2) New Zealand has prided itself on its ‘clean and green’ environmental practices (albeit sometimes unwarrantedly), and so it is interesting to examine the GSCM practices of this well-known sector (Economist, 2010, OECD, 2007) (Davies, 2009). (3) Furthermore, F&B is the largest manufacturing sector in New Zealand and represents over 10 per cent of the country’s Gross Domestic Product (GDP). It also contributes heavily to the country’s exports, with a worth of approximately US$17 billion in 2008 (New Zealand Trade & Enterprise). (4) For the New Zealand F&B industry, indeed for the country’s own image, the threat of environmental degradation and contamination would be particularly disastrous to the economy, thus prompting an early focus on ensuring the sustainability of the supply chain (Aberdeen Group, 2009).

We have given these companies fictional names: (1) Fruity Ltd. is involved in fruit, vegetable and cut-flower distribution to retailers. It has a specialty department for organic fruit and vegetables that constitutes ten per cent of sales. (2) Juicy Ltd. is a juice producer with two main brands at different levels of perceived environmental friendliness. (3) Milky Ltd. is a dairy producer and has no special organic product but is highly involved in green practices.

COMPANY CASES

The format of this paper does not allow space for the extensive narrative of these rich cases, so we now summarise emergent constructs for each company.

The purpose of the research was to examine how companies in the F&B sector in New Zealand implemented green practices. We sought to answer the overall research question, What operational factors (or constructs) can be extracted from these case data that lend themselves to theorising about implementing Green Supply Chain Management?

From the data analysis, we saw four constructs emerging in the adoption of GSCM practices. The presence or absence of:
Explicit environmental strategy and planning tied to clear objectives consistent with vision and mission.

Top management commitment supported by systems that measure costs incurred through GSCM.

People management and company culture characterised by employee awareness, knowledge, skills, and expertise brought about through organisational learning complemented by an adequate rewards system.

Strong collaboration and trustful communication with members of the supply chain toward the goal of integrating suppliers into the production process and rationalising the supply chain.

Figure 1: Emerging constructions in GSCM adoption

The present section is divided into the four main themes identified in the literature: strategic and operational planning; management structure, systems and decision-making; management of people and company culture; and relationships with supply-chain members.

Explicit environmental strategy and planning

What impact does strategic and operational planning have on environmental efforts within the company? Adopting green practices can be described as a process, influenced by a mixture of public awareness of environmental concerns, internal motivations, marketing reasons, cost savings, and exploitation of sales opportunities.

Fruity and Juicy show how one sustainable product, even if only a small part of the product range, can affect the whole company. For Juicy, this process was not forced upon it from
outside; rather it came from inside the company through the acquisition of an organic brand, which had a subsequent effect on its environmental culture. For Fruity, the decision to have an organic product range triggered company-wide environmental efforts. That led Juicy to more sustainable packaging solutions and then to Triple Bottom Line (TBL) reporting.

Milky was different. The initial impetus came from the employees, but regulatory pressures were also influential, and the market was demanding action. Through top-management support, environmental strategy was built-in across the company to the point that it is now seen as a crucial part of the company’s strategy and a precondition for long-term profitability and survival.

In Fruity and Juicy, there were no specific company environmental objectives; instead, the desire for greening came on a case-by-case basis from the employees. Srivastava (2007) would classify these companies as ‘proactive’ because they invested moderate effort and resources. But it is Milky that is a step higher since its environmental efforts were a priori integrated into the business strategy. At Milky, a case-by-case approach would have led to chaotic and inefficient decisions and tensions within the company as well as with external stakeholders.

All the companies state that being environmentally-friendly gives them an edge over competitors, but each has a different set of challenges. Fruity now wants to implement its own Triple Bottom Line approach. It intends to keep an eye on the organic market and react if consumer demand picks up. Juicy’s environmental approach stands at a crossroads. Either it implements a systematic way to cope with environmental issues, or it keeps going as before and perhaps risks losing touch with its green heritage and not knowing where to go next. Milky’s strategic challenge is on a different level. Its challenge is to maintain the momentum in greening the business and to keep people interested, since being sustainable is not really part of everyone’s mindset.

**Top management commitment**

We next consider how the decisions concerning green practices are being made, from a management perspective. The flat management structures at both Fruity and Juicy help them to make quick decisions and to be flexible. But their lack of a systematic approach causes confusion and inconsistency especially amongst staff, and this hinders more efficient solutions. Fruity is trying to change the situation through the introduction of Triple Bottom Line (TBL) reporting, but it has no environmental vision or implementation plan to motivate its TBL efforts. Juicy, currently, only has a marketing imperative to sustain its efforts at
greening, and, as already discussed, it might end up having trouble defining its own internal motivations in terms of sustainability. Until now, only a small number of people have been concerned with environmental issues. Both of these companies treat GSCM on a case-by-case basis; there is no person or ‘champion’ especially assigned to deal with sustainability issues. Such ‘champions’ arise more from personal engagement and interest. At Juicy, the marketing staff has taken over sustainability issues due to the necessity of projecting an environmentally-friendly brand image. Milky, however, is at a different level altogether. It has a full range of teams dedicated only to environmental initiatives.

The literature does point out how critical top-management support is for the success of an environmental approach (Lee and Rhee, 2007, Daily and Huang, 2001, Angel del Brio et al., 2008, Miller, 1997). At Fruity, top-management support backs the environmental direction of the company, but does not seem to be directly engaged. This might be because of the low importance of the organic part of the business for the whole company. In Juicy, top-management support for environmental practices is primarily seen as a tool to increase sales. At Milky, top-management commitment continually motivates staff through support of new sustainable programmes and internal communication.

Thus, decisions are made differently in each company and are based on different foundations. For Fruity, most decisions are currently made around packaging. These packaging decisions are supposed to ‘make sense’ in terms of not being too costly and being comparable to a conventional product. Decisions concerning packaging issues are then mainly made by the organic department without much attention from the top-management. For Juicy, decisions are based on marketability and cost-effectiveness. At Milky, decision-making is more complex and corresponds to strategic goals and objectives. Proposals for new practices are reviewed by a committee or developed through the various environmental departments. Some decisions are also made by foreseeing legislation issues on the horizon.

**People management and company culture**

How important for the success of a green strategy is the buy-in of all employees and the creation of a green company culture? Fruity and Juicy are similar in that neither has a vision or mission to guide their employees. Amazingly, some employees do not even know about the current green practices. There are no other strategies to ensure staff buy-in. This might not just lead to losing direction, but also to insufficient exploitation of staff capabilities (Angel del Brio et al., 2008). In contrast, at Milky, the existing vision and mission have a stimulating effect. Practices seek to obtain staff buy-in, including competitions, magazines, feedback and the feeling of really making a difference (Govindarajulu and Daily, 2004).
Interestingly, in all examined companies, respondents talked about the importance of changing the people’s mindset not just in the business but also at home. Staff are expected to transfer the new skills and attitudes to their behaviour at home, thus developing a real commitment that is not forced on them.

Supply-chain collaboration and trust

Which types of supply-chain relationships are critical for companies to achieve their green targets? Fruity and Juicy have no policy related to their supply chains, apart from compliance with national standards for organic products. Other than that, there are no binding demands based on internal or external guidelines. Both are focused on their packaging suppliers and green purchasing. This is a good beginning and constitutes the ‘low-hanging fruit’. But Fruity’s approach does not involve reciprocal learning in the supply chain; it merely orders green packaging and expects suppliers to develop their own products. In comparison, Juicy has a more advanced relationship with some of their suppliers. In particular, they have had a long relationship with their biodegradable label supplier based on trust and exchange of ideas.

Milky has the most advanced way to relate to suppliers. One reason is, of course, its larger size, which helps to persuade suppliers to comply and provides the essential resources to focus on environmental processes. Milky articulates what it wants, and, similar to Juicy, works in collaboration with some packaging suppliers. Joint packaging development with suppliers seems to be one process that all three companies have in common. Further, Milky has distinctive traits in terms of their supplier relationships. The company works as a co-operative, where most of its raw-material suppliers are also shareholders of the company. Another of their initiatives was to implement a ‘supplier questionnaire’ for high-risk suppliers in order to assess their performance in terms of sustainability.

All three examined companies believe in business networking to develop their green practices. Milky’s respondents emphasised how helpful it is to talk to other companies, even from other industries, which have roughly similar problems and challenges to deal with. For Fruity, the role of the trade association helps keep momentum going. Juicy recognises the importance of a business association, but stated that it does not utilise the services currently due to lack of time.

Fruity and Juicy both mention the woeful state of the recycling infrastructure in New Zealand. Because of the lack of recyclers, waste is either being exported or goes into landfills. This situation is seen as contrary to their efforts and, therefore, discouraging.
Apparently, Milky does not encounter these problems. This might be because Milky’s size gives them more opportunities to make direct contracts with waste companies.

**CONCLUSIONS**

In this research, we sought factors that are considered to be most important for Green Supply Chain management in Food and Beverage companies in New Zealand. We did have a normative goal of looking for ways to help companies understand some of the steps they should consider in making their supply chains green, sustainable, and profitable. To answer this research question, a theoretical framework was derived, including the factors of: strategic and operational planning; management structure, systems, and decision-making; management of people and company culture; and relationships with supply-chain members.

One interesting result from the examination of Fruity and Juicy was the effect of the organic product range on the alignment of the whole company. The acquisition, or rather introduction, of environmentally-friendly products led to more thought being given to the entire company’s sustainability. Fruity is trying to implement a Triple Bottom Line approach, and Juicy is extending its environmentally-friendly packaging approach to the non-organic brand. This insight could be helpful for other companies to consider. In this sense, it is not necessary (and, most likely, not possible) to shift the whole product range to sustainability all at once, but it is advisable to learn from one green product or line of products. This finding corresponds with the statement of Zhu et al. (2008b) who write about interdependencies and inter-relationships of different green practices.

However, it is also advisable to integrate an environmental strategy, including an environmental vision and/or mission statement, into the general company strategy. This is essential to give the firm a direction for long-term planning by the top-management, as well as for the operational planning to guide the staff in their daily routines. Fruity and Juicy only work on a case-by-case basis and could, more profitably, follow Milky’s example and develop a set of measurable and explicit goals and objectives.

The most important driver for all companies to have green practices in place is the prospect of saving money. In most cases, being more efficient and more environmentally-friendly means saving costs. Marketing is also an important driver. In particular, Juicy emphasises the importance of being recognised as innovative as an advantage against their large competitors. Another driver is to stay up-to-date about what the customer is demanding. All examined companies regarded having an environmentally-friendly approach as a source of competitive advantage.
To conclude, despite being in the same industry, the research has shown that each examined company is in a different situation, with different factors influencing their environmental approach. Nevertheless, one core characteristic should be to include environmental strategy in the general company strategy to achieve consistency across the entire operations. This facilitates the achievement of a competitive edge over their competitors.

Flat hierarchical structures, as we see in Fruity and Juicy, seem to be an advantage. Decisions can be made quickly and easily, which leads to a high responsiveness. At the same time, a flat hierarchy can be a barrier to systematic implementation. Despite being relatively complex, the environmental systems of Milky advance their green aspirations. They have monitoring tools and measurement systems. They ensure staff buy-in in several ways, and top-management endeavour to lead by example.

All companies state that top-management support is crucial for the success of a GSCM strategy. They have to back the sustainable approach and show commitment. Furthermore, it is their job to promote the implementation of systems to bring in the concept of sustainability in all layers of the company on a strategic and operational level. Only in Milky is top-management substantially involved in the promotion of a green strategy. Decision-making in each company is based on monetary considerations. Increased efficiencies through environmentally-friendly practices lead to cost savings.

An environmental management system, including consistent goals and objectives, is highly recommended. The top-management has to support these goals completely and adjust their company management accordingly. A flat hierarchical structure might assist with a successful GSCM approach, but it is not mandatory. However, if a flat hierarchical structure exists it should be exploited as an advantage, for instance, through employee involvement.

Employee buy-in and involvement in GSCM practices is important yet neither Fruity nor Juicy is taking action to ensure staff buy-in. There is no vision and/or mission to guide their staff or any other strategy to encourage employee input. Milky, on the other hand, is trying hard to get staff buy-in with several approaches, including a vision and mission, magazines, exemplary behaviour of top-management, and competitions.

Company culture is the key to a sustainable competitive advantage. Fruity has no such company culture, whereas Juicy has it only in relation to the acquisition of the organic brand, but is not nurturing this culture. Milky has an environmentally-concerned company culture but needs to work hard to maintain this culture. Interestingly, all companies mentioned the importance of changing people’s mindset, not only for the business but also on a private
level. People are supposed to get used to environmental practices and transmit their behaviour at the company to their behaviour at home.

Employee involvement is, indeed, very important for a working GSCM approach. Companies have to exploit the potential of their employees by providing a participative environment and valuing the attainment of environmental goals. The company culture is serving as a tool to facilitate a supportive environment. The foundation for staff involvement is an environmental vision and/or mission from which all practices can be derived.

Collaborative approaches are promising the most fruitful results. Juicy and Milky are trying to include suppliers in their efforts to improve their environmental impact. A further interesting tool employed by Milky is the supplier questionnaire, where vendors are questioned about their sustainability in terms of ethics and environmental issues. Derived from their answers, the company makes its buying decisions and, by so doing, changes the sustainability further up the supply chain.

A collaborative approach is the most promising form of a working relationship to achieve environmental goals. Companies should pursue this strategy first with suppliers, where the biggest environmental improvements can be achieved. Other tools, for instance, supplier questionnaires, would be helpful for reducing suppliers’ environmental impacts, and would have an effect on the environmental friendliness of the whole supply-chain.

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